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Transformative Extension Education in Nigeria: Emerging Issues and Unlocking Opportunities for Sustainable Development

By
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Abstract

Transformative extension education in Nigeria is pivotal for addressing emerging national development challenges while unlocking opportunities for sustainable growth. As the nation grapples with food insecurity, climate change, and rural-urban migration, the role of extension services in disseminating innovative developmental techniques, improving productivity, and empowering rural communities is very necessary. Using critical literature review of scholarly articles published in reputable journals from 2020-2024 and perspective analysis, this paper examines the evolving landscape of extension education in Nigeria, highlighting key emerging issues and explored the immense opportunities for sustainable development. The paper found continuous use of traditional extension service delivery approaches such as training and visits (T & V), use of traditional tools and culture as major impediments towards goals attainment. In view of the above, there is urgent need for a paradigm shift in extension service delivery, advocating for a holistic technology-driven and issue-specific approach to ensure security and sustainable national development in Nigeria. The paper concludes that Nigeria's extension education can drive national transformation, reduce poverty, and contribute to the Sustainable Development Goals (SDGs).The paper recommends high-level the integration of digital tools, such as mobile-based advisory services, e-learning platforms, inclusive youth and women engagements to enhance knowledge dissemination and skills acquisition. Additionally, participatory approaches, including mobile schools and gender-inclusive programs, to foster community ownership and improve adoption rates of improved practices

Keywords: *Extension education,* emerging issues, opportunities, sustainable development, innovation.

Introduction

Extension education has long been recognized as a vital tool for rural development, poverty alleviation, and the enhancement of food security, although within the premise of agriculture and in real sense it has penetrated into other sectors of the economy such as health, commerce, engineering, architecture, entrepreneurship and other sectors of sustainable development. Specifically, Extension Education is a non-formal educational system that disseminates knowledge, skills, and innovations from academic and research institutions to rural and urban communities. It aims to improve livelihoods by bridging the gap between scientific advancements and practical applications in agriculture, health, family welfare, and community development (Gombe, 2022). In Nigeria, a country with a predominantly rural population, the role of extension education is both critical and complex (FMARD, 2022). As the nation grapples with the multidimensional challenges of insecurity, climate change, youth unemployment, and underdeveloped rural economies, the imperative for a transformative approach to extension education becomes increasingly urgent. A paradigm shift is needed, one that transcends traditional information dissemination and embraces a more inclusive, participatory, and innovation- driven model.

Arguably, agriculture extension is the basis of all extension education efforts dated back to colonial period, however, later extended to other sectors based on the need for holistic sustainable development. Since, agriculture remains the

backbone of Nigeria's economy, contributing about 23% of the GDP and employing over 70% of the rural population (National Bureau of Statistics, Q3 2023 report, p. 26). Looking at the numerous challenges faced by the sector, extension education was introduced to bridge the gap between research institutions and farmers by disseminating knowledge, promoting best practices, and facilitating technology adoption. However, despite its importance, Nigeria's extension system is plagued by inefficiencies, including inadequate funding, poor infrastructure, and a shortage of trained personnel (Adebayo & Oladele, 2021).

However, emerging issues such as multi-dimensional security challenges, climate variability, resource degradation, market volatility, poor leadership style, and the digital divide pose significant threats to productivity, livelihoods and sustainable development in Nigeria. These challenges are further compounded by systemic issues, including inadequate infrastructure, weak institutional frameworks, limited public investment in extension services, and a fragmented policy environment (Idrisa, Ogunbameru, & Madukwe, 2018). Moreover, Nigeria's demographic trends marked by a youth bulge and rapid urbanization demand a reimagining of how extension services are designed and delivered. Youth engagement in agriculture and other community development initiatives, for instance, remains low due to perceptions as being labor-intensive and unprofitable (NBS, 2023). Without transformative educational strategies that can make the aforementioned more attractive, competitive, and technologically driven, the country risks losing an entire generation of potential innovators in agriculture, health, commerce and entrepreneurship (Idrisa, Ogunbameru, & Madukwe, 2018).

Moreover, unlocking the opportunities presented by transformative extension education also necessitates a providing conducive policy and institutional environment. This includes revisiting the existing national extension policy, increasing budgetary allocations, and promoting partnerships among government agencies, NGOs, the private sector, and farmer organizations. Multi-stakeholder collaboration can enhance the efficiency and reach of extension services, while also fostering accountability and shared ownership (Olorunfemi., Olorunfemi & Oladele, 2021). In addition, aligning extension strategies with Nigeria's broader development goals such as those articulated in the Sustainable Development Goals (SDGs) and the Agricultural Promotion Policy (APP) will help ensure coherence and impact. In the long-run, this alignment can facilitate attainment of food security, creation of additional job openings and reduce poverty, illiteracy and child mortality due to malnutrition.

Furthermore, Agwu, Ekwueme, & Anyanwu, (2020) observed that, one of the most promising opportunities lies in leveraging the energy, creativity, and resilience of Nigerian youth. With the right support systems in place, young people can drive innovation across the agricultural value chain from agritech startups and mechanization services to agribusiness enterprises, climate-smart agriculture, E- commerce and digital extension services (FAO, 2023). Embedding entrepreneurship and digital skills into extension curricula can unlock new economic opportunities for youth while revitalizing the agricultural sector. Similarly, recognizing and promoting the contributions of women in agriculture can enhance productivity and household welfare. Gender-responsive extension strategies are

essential to ensuring that women have equal access to resources, training, and decision-making spaces (Okunade, & Ibrahim, 2019). In view of this background, this paper explores transformative extension education in Nigeria with much emphasis on emerging issues and unlocking opportunities for sustainable development.

State of Extension Education in Nigeria

The extension education system in Nigeria is a critical, it plays a crucial role in bridging the gap between agricultural research and practical application, yet its current state faces significant challenges. It is one of the underperforming components of the country's holistic development framework. Statistical data reveals a complex landscape requiring immediate attention. The Food and Agriculture Organization (FAO) estimates that only 23% of Nigerian clients have access to extension services (FAO, 2023), highlighting a substantial disparity in knowledge dissemination. Furthermore, a study by the National Bureau of Statistics (NBS) indicates that the ratio of extension agents to clients is approximately 1:5000, far exceeding the recommended international standard of 1:400 (NBS, 2024). This inadequacy limits the reach and effectiveness of extension programs.

However, Adebayo, & Oladele, (2021) suggested that, despite its recognized importance in enhancing all- round productivity, improving rural livelihoods, and supporting sustainable development, the system faces numerous challenges that have limited its effectiveness over the years. Overall, the extension education system in Nigeria is at a crossroads. While it has a foundational structure and a vast network of institutions, its current state reflects deep-rooted structural, institutional, and operational challenges. Beyond availability, the quality of extension services also demands scrutiny. Research suggests that a significant proportion of extension agents lack updated training on contemporary techniques in climate-smart agriculture, E- commerce and E-business (Adebayo et al., 2020). Consequently, clients are often unable to adopt innovative practices that enhance productivity and sustainability.

Furthermore, the distribution ratio of Agricultural Extension Agents (AEAs) to farmers in Nigeria varies significantly by state and is generally inadequate, with no single authoritative nationwide dataset. The national average estimates range from 1: 4,500 to 1:10,000 (AEA:Farmers), far above the FAO recommended ratio of 1:800 to 1:1,000. In 2019 FMARD report cited an average of 1:5,000, though with massive inter-state disparities because of varying population and funding of the sector by the state government

.

Table 1 Distribution of Extension workers/clients Ratio by Some Selected States

S/N	State	Ratio (EW:Client)	Remark
1	Niger State	1:1,500	Grossly inadequate
2	Kano State	1:2,500	Inadequate
3	Ogun State	1:3,000–1:4,000	Inadequate
4	Cross River/Ebonyi States	1:7,500–1:9,500	Grossly inadequate
5	Benue	1:6,000	Grossly inadequate
6	Sokoto	1:4,000	Inadequate
7	Gombe	1:6,500	Grossly inadequate
8	Bauchi	1:5,300	Grossly inadequate
9	Lagos	1:3,650	Inadequate
10	Taraba	1:9,200	Grossly inadequate
11	Kaduna	1:2,200	Inadequate
12	Ondo.	1:7,000+	Grossly inadequate
13	Enugu	1:6800	Grossly inadequate

Sources: State Agricultural Development Programs (ADPs)

Some other factors that led to the disparities among the states includes donor- supported programs like ATASP-1 and higher government prioritization (FAO, 2023).

Moreover, states with higher agricultural budgets (e.g., Kano, Kaduna) employ more AEAs. States with higher donor programs like Niger, Benue, and Sokoto are expected to also have low ratio as depicted in Table 1. In addition, institutional gaps have left many AEAs under-trained, under-equipped, or inactive due to unpaid salaries, this has also created wider gap in ratio. Farmer Population in states with dense farming populations (e.g., Benue, Taraba) face severe coverage gaps as shown in Table 1 Taraba has the highest ratio of 1:9200 farmers. Recent Trends has indicated worsening ratios, FMARD (2023) identified retirements and hiring freezes have expanded ratios to 1:7,000+ in many states like Enugu, Ondo, Gombe and Oyo, however, private sector involvement such as Sassakawa Africa Association (SAA), Alliance for a Green Revolution in Africa (AGRA) and Syngenta Foundation initiatives supplement AEAs in some Nigerian states and it helps in improving localized ratios.

However, in efforts to revitalize the system, Nigeria needs to embrace transformative reforms, professionalizing the extension workforce, adopting participatory approaches, leveraging ICT, improving coordination, and ensuring inclusivity (Nwachukwu & Onyeneke, 2022). A reimagined extension system, backed by strong policy support and adequate investment, holds immense potential to drive sustainable development across the country. In addition, addressing these issues require increased investment in extension infrastructure, enhanced capacity building for extension agents, and a greater focus on utilizing digital technologies to broaden access and improve the quality of extension education nationwide. Failure to do so will continue to hinder holistic sustainable development and food security in Nigeria.

Current Challenges of Extension Education in Nigeria

Extension education services in Nigeria play a crucial role in bridging the gap between research institutions and clients by disseminating knowledge, promoting modern problem-solving techniques, and enhancing productivity. However, in Nigeria, extension education faces significant challenges. Some of these re-occurring challenges as highlighted by (Nwachukwu & Onyeneke, 2022; Adebayo, & Oladele, 2021) and are classified as follows:

Financial Challenges

The Nigerian extension system is characterized by fragmentation across federal

, state, and local government levels. While the Federal Ministry of Agriculture and Food Security (FMAFS), and Ministry of Health and Social Development provides policy direction, actual implementation of extension services largely falls under the responsibility of State Agricultural Development Programmes (ADPs) and Ministry of Health or Primary Health care Development agencies (PHDA). Other components of extension services such as gerontology and community development are left floating as subsidiaries in other MDAs. This decentralized model has led to inconsistencies in policy implementation, uneven service delivery across regions, and duplication of efforts. Moreover, public extension services in Nigeria suffer from chronic underfunding. Budget allocations to extension services are often below international recommendations (such as the Maputo Declaration target of 10%), and within those allocations, extension receives a small fraction. This limits the capacity to train personnel, invest in logistics, or adopt modern technologies.

In addition, agriculture and other extension services suffer from chronic underfunding, leading to a shortage of vehicles, training materials, and operational resources. Some of the reasons behind underfunding includes low Government Budgetary Allocation (Maputo Declaration, 2003; Malabo Declaration (2014; FAO, 2019); Over dependence on Donor Funding (World Bank, IFAD), poor sustainability plan, when donor projects end, extension systems collapse due to a lack of continuity (Oyinbo et al., 2023). Poor financial management, and corruption (Agwu et al., 2020), weak private sector involvement and underdeveloped Public-Private Partnerships (PPPs) in extension, limiting alternative funding sources (World Bank, 2022). However, some private organizations and NGOs have initiated their own extension-like services (especially in value chains like cocoa, rice, and oil palm) in the area of agriculture, their reach is still limited and other areas are highly neglected (Oyinbo et al., 2023; Ogunniyi et al., 2020). There is an emerging push toward a pluralistic extension system involving multiple stakeholders, public, private, and civil society, but the policy and regulatory framework to coordinate and support such a system is still weak (Yahaya & Olawepo, 2020).

Institutional Challenges

The extension workforce in Nigeria is insufficient in both quantity and quality. The World Bank recommends a client-to- extension-agent ratio of 800:1, but in many Nigerian states, this ratio is over 10,000:1 (World Bank, 2022). In addition, many extension workers lack up-to-date training, with limited access to refresher courses or exposure to modern technologies and techniques. This gap hinders their ability to provide relevant, practical, and timely support to clients. In many states, extension units are under-equipped, lack autonomy, and operate without clear mandates or performance monitoring systems (Oladele, 2021). Moreover, predominant extension models in Nigeria remains largely top- down and supply-driven, relying heavily on linear transfer-of-technology methods. This approach limits clients participation, ignores indigenous knowledge, and fails to adapt to the diverse needs of the communities. In contrast, modern extension systems increasingly favor participatory, demand-driven, and pluralistic approaches, which are yet to be widely adopted in Nigeria. Extension educators heavily rely on obsolete training manuals and face-to- face methods rather than digital solutions (e.g., mobile apps, e-extension). This barrier has led miss out on timely interventions and innovations like precision

agriculture, climate-smart techniques, and market linkages (Adebayo & Oladele, 2021). In addition, 63% of field agents report receiving research updates less than once annually (Nwachukwu, 2023) which has affected their performance in prevention mechanisms.

Technical Challenges

There is a wide gap in deploying technical expertise in extension services delivery across the varying sectors. While some progress has been made in integrating Information and Communication Technologies (ICTs) into agricultural extension (such as mobile-based advisory services and radio programs), adoption remains limited and uneven. Many rural clients still lack access to mobile devices, internet connectivity, or the digital literacy needed to benefit from these tools talk less of ICT-based extension (Adebayo & Oladele, 2021). As a result, the potential of ICTs to scale up extension services and bridge knowledge gaps remains underexploited. Clients lose confidence in extension services when agents rarely visit or provide outdated information, this has led to low adoption of improved practices leads to stagnant productivity (Nwachukwu & Onyeneke, 2022).

Consequently, there exist a persistent disconnect between research institutions, extension services, and end- users. The flow of innovations from research to extension and then to the field is often slow or disrupted. Similarly, feedback loops from clients back to researchers are weak or non-existent (Onyeneke, 2022). This undermines the relevance and effectiveness of research outputs and limits opportunities for collaborative problem-solving. Disconnect Between Research and Extension sometimes take about 8-10 year lag between research breakthroughs and field-level training adoption International Institute of Tropical Agriculture (IITA, 2022) and only 12-15% of agricultural innovations from Nigerian Research Institutes (NARIs) achieve field-level adoption (FMARD, 2023).

Socio-demographic Challenges

Extension services in Nigeria have historically been male-dominated and often overlook the specific needs and roles of women and youth. Many extension agents are not trained in gender-sensitive programming, leading to marginalization of women who are key actors in community mobilization, engagement and project implementation. Similarly, youth are often excluded from extension interventions, despite their potential as agents of innovation and change in the sector (FAO, 2023). Moreover, 82% of extension materials use male-centric language and imagery (Okunade & Ibrahim, 2022). Despite women constituting 43% of Nigeria's agricultural labor force (FAO, 2023), persistent gender disparities in extension service delivery continue to undermine agricultural productivity and rural development. This paper posits that, multidimensional nature of gender gaps in Nigeria's extension system, their socioeconomic impacts, and evidence- based strategies for achieving gender- responsive transformation (African Development Bank, 2023). This requires moving beyond tokenistic approaches to transformative institutional restructuring, targeted resource allocation, and sustained gender mainstreaming to reduce the quantum of women and youth clients that are particularly underserved (Okunade & Ibrahim, 2019).

Emerging Issues in Extension Education

As the global community grapples with urgent challenges such as climate change, social inequality, and food insecurity, the role of transformative extension education is becoming increasingly vital. Transformative extension

education emphasizes not only the dissemination of knowledge but also the active engagement of communities in co- creating solutions that drive unlocking opportunities for sustainable development. This approach shifts the focus from a top- down model of information transfer to a more collaborative and participatory paradigm that empowers individuals and groups to take charge of their own development. However, in the process of driving the desired change, some issues such as the integration of innovative pedagogical methods, such as experiential learning and digital technologies, to enhance the learning experience and foster critical thinking. Additionally, addressing the inter-sectionality of social, economic, and environmental factors is essential to ensure that extension services are inclusive and equitable, particularly for marginalized communities. Some of the critical emerging issues in extension education include:

Climate Change and Resilience Building in Extension Education Climate change is increasingly becoming a critical challenge worldwide, affecting agriculture, natural resources, and rural communities (FAO, 2023). In extension education, the focus has shifted toward equipping clients, communities, and stakeholders with the necessary knowledge and skills to adapt to climate change and build resilience. However, since extension education traditionally focuses on disseminating scientific knowledge and best practices in agriculture, health, and rural development, it became vulnerable to climate change which introduced new complexities as identified by Nwachukwu, & Onyeneke, (2022). They includes: ***Unpredictable Weather Patterns****:* Changes in rainfall, temperature, and extreme weather events impact crop production and food security. ***Pest and Disease Outbreaks****:* Rising temperatures create favorable conditions for pests and diseases, affecting plant and animal health. ***Soil Degradation and Water Scarcity****:* Increased droughts and floods degrade soil quality and reduce water availability for farming. Climate change and resilience building are critical emerging issues in extension education. By incorporating climate-smart strategies, risk management, and community-driven solutions, extension services can help communities adapt to climate change while ensuring sustainable livelihoods. The future of extension education must prioritize integrating climate resilience to enhance food security, environmental sustainability, and rural development.

Digital Transformation and Youth Engagement in Extension Education

Extension education is undergoing significant changes due to advancements in digital technology and the increasing role of youth in agriculture and rural development. Digital transformation enhances knowledge dissemination, while youth engagement ensures the sustainability of extension programs. Addressing both issues is crucial for modernizing extension services and making them more inclusive, efficient, and impactful. Digital transformation refers to integrating technology into extension services to improve knowledge delivery, communication, and decision-making. It is an emerging issue due to its potential to increase efficiency, reach, and impact. Some of the notable ways of digital transformation in extension are clearly depicted in the form of ***Mobile-Based Advisory Services****:* Farmers and extension agents use SMS, WhatsApp, and mobile apps for real-time updates on weather, market prices, and best agricultural practices.

E-learning and Virtual Training*:* Online courses, webinars, and digital platforms provide continuous learning opportunities for clients and extension workers. ***Big Data and AI in extension:*** Artificial intelligence (AI), use of drones, remote sensing and data analytics improve precision, pest control, delivery of drugs and resource management. ***Social Media for Extension Services***: Platforms like Facebook, YouTube, and TikTok help reach young clients with engaging content (Adebayo, & Oladele, (2021).

Moreover, youth engagement is another emerging issue in extension education because young people are the future for sustainable development. However, many young individuals view development efforts as unattractive due to outdated practices, low profitability, and limited access to land and finance. Digital tools can help bridge this gap by making agriculture more appealing and accessible. Some additional reasons why youth engagement is necessary in extension are**:** ***Aging Farmer Population****:* Most clients in both agriculture and health are elderly, and there is a need to involve youth in agriculture to ensure food security and disease prevention. ***Innovation and Technology Adoption****:* Young people are more tech-savvy and can drive digital transformation in all developmental efforts. ***Job Creation and Economic Growth****:* Engaging youth in businesses and tech startups that can reduce rural unemployment (IITA, 2022)

Policy and Institutional Reforms as an Emerging Issue in Extension Education Policy and institutional reforms are becoming critical emerging issues in extension education due to the evolving agricultural landscape, climate change, digital transformation, and the need for more inclusive and efficient extension systems. Effective policies and institutional frameworks are essential for ensuring that extension services remain relevant, responsive, and impactful. Extension education plays a crucial role in disseminating agricultural knowledge, improving productivity, and enhancing rural livelihoods. Policy and institutional reforms required for strengthening extension service delivery includes: ***Decentralization of Extension Services:*** **This involves** shifting from centrally controlled extension models to decentralized systems which allows local governments, NGOs, and private sector actors to provide more tailored and effective services, and enhances community participation that ensures extension programs are responsive to local needs.

In addition, ***Public-Private Partnerships (PPPs) in Extension*****:** Governments are increasingly collaborating with private companies, agribusinesses, and digital service providers to improve extension service delivery. ***Adoption of Digital and ICT- Based Policies*****:** Integrating digital tools such as mobile-based advisory services, AI- driven decision support systems, and e- learning platforms. ***Gender and Youth Inclusion in Extension Policies*****:** Reforms should promote policies that encourage the active participation of women and youth in all developmental efforts without discrimination (Adebayo, & Oladele, (2021). Special incentives, training programs, and financial support can help marginalized groups access extension services (FAO, 2023).

Conclusion

Transformative extension education in Nigeria stands at a pivotal crossroads, offering both significant challenges and remarkable opportunities for sustainable development. While traditional extension systems have achieved

incremental progress, the dynamic socio-economic landscape demands a paradigm shift toward more inclusive, participatory, and technologically empowered models. Nevertheless, unlocking Nigeria's vast agricultural potential requires leveraging digital innovations, fostering multi- stakeholder collaboration, and prioritizing context-specific curricula that empower local communities as active agents of change. Strategically addressing these constraints through policymaker commitment, investment in capacity- building, and embracing evidence-based approaches can elevate extension services to become transformative forces for rural prosperity. The future of extension education in Nigeria depends on a collective resolve to reimagine, innovate, and sustain practices that respond to the evolving needs of farmers and society at large.

Recommendations

Based on the review and findings, the following recommendations are suggested

1. Government and NGOs should facilitate deployment of high-level and integration of digital tools, such as mobile-based advisory services, e-learning platforms, inclusive youth and women engagements to enhance knowledge dissemination and skills acquisition.
2. Subject-matter-specialist and MDAs should adopt a participatory approach including mobile schools and gender-inclusive programs, to foster community ownership and improve adoption rates of improved practices.
3. Government should develop policies that can enable digital extension service providers' free access to the registered farmers and ensure effective monitoring and evaluation to avoid exploitation.

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Confronting Emerging issues of Mycotoxins: Knowledge of Prevention and Control Measures among Fruit and Vegetable Sellers in Yanlemo and Yankaba Market, Kano State, Nigeria

By

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Abstract

This study determined the knowledge of Preventive and Control measures of vegetable mycotoxins in Yanlemo and Yankaba markets between fruit and vegetable sellers in Kano Metropolitan, Kano State, Nigeria**.** Three (3) objectives were transformed into hypotheses to guide the study; the estimated population was 10,000 fruit and vegetable sellers in Yanlemo and Yankaba Markets. Cross sectional research design was used for the Yankaba markets, simple random sampling was use to select 370 fruit and vegetable sellers in Yanlemo and Yankaba Markets, self-developed questionnaire named "Knowledge of Preventive and Control measures of mycotoxins between fruit and vegetable sellers' questionnaire" with a reliability index of 0.84 was used for data collection. One-sample t-test and independent t-test were used to test the hypotheses at 0.05 level of significance. The results show significant poor knowledge of prevention and control measures of mycotoxins among fruits and vegetable sellers (t_{cal}= - 35.420, df=369, P<0.05); there is significance differences in knowledge of prevention and control measures of mycotoxins among fruit sellers and vegetable sellers in Kano state. (t_{cal}= - 4.077, df=368, P>0.05); there is no significant difference in knowledge of prevention and control measures of mycotoxin based on market location (t_{cal}= -1.740 & -1.433, df=368, P<0.05). Therefore, it is recommended among others that government should enforce strict regulations on mycotoxins level in fruits and vegetables, health education campaign to fruits and vegetable sellers and the general public on health effect, preventive & control measures of fruits and vegetable mycotoxins as well as provision of functional storage facilities to reduce spoilage of fruits and vegetables in both Yankaba and Yanlemo market Kano State

Key words: *Knowledge,* Mycotoxins, fruit sellers, vegetable sellers, Prevention and control

Introduction

Mycotoxins are secondary metabolites produced by pathogenic fungi that colonize fruits and vegetables either during harvesting or during storage (Nina, Huali & Yang, 2022). The term myco-toxin comes from the Greek 'mycos' meaning fungus and from the Latin 'toxicum' meaning poison, refer to toxic chemical substances produced by certain moulds that develop on certain foods, in particular on cereals but also affect fruits and vegetables; Moulds are multicellular fungi that form thin thread like structures called hyphae which are widely distributed and found wherever moisture is present (Adejumo & Adejoro, 2014). Fu Sanzani, Reverberi and Geisen (2016) explained that the main route of infection of mycotoxigenic fungi to fruit and vegetable is that they can successfully colonize the host through wounds or natural orifices on the surface of fruits and vegetables before harvest; during the growth period, the host has strong resistance to exogenous, biological or abiotic stress. Mycotoxin contamination in fruits and vegetables has been an emerging issue and a major problem worldwide, which poses a serious threat to human and animal health through the food chain (Nina, Huali & Yang, 2022). *Trichothecenes (TCs*) produce by Fusarium fungi; known for their toxic effects on humans and animals, *Ochratoxin A (OTA)* produces by Aspergillus and Penicillium fungi; associated with kidney damage and carcinogenic effects, *Patulin (PAT)* produce by penicillium fungi; known for its toxic effects on the liver and gastrointestinal tract, *Alternaria toxins (ATs)* produces by Alternaria

fungi; associated with DNA damage and cytotoxicity were serious issues that need to be confronted by effective detection and control methods like chromatographic technology using mass, ultraviolet or fluorescence detectors to identify and quantify mycotoxin, electrochemical biosensor technology for rapid detection of mycotoxins, immunological techniques using antibodies to detect specific mycotoxins and physical, chemical and biological methods of degrading or detoxifying mycotoxin in fruits and vegetables (Nan, Xue & Bi, 2022; Awuchi, et. al. 2022). The accumulation of mycotoxins in fruits and vegetables is not only a potential threat to human and animal health but also results in serious economic losses, it is very important to minimize the potential risks to humans and economic losses through the monitoring, detection and control of mycotoxins (Da Rocha, da Chagas, Feitosa, Florindo & Rondina, 2014).

Kagot, Okoth, De Boevre and De Saeger (2019) and Sanzani, Reverberi & Geisen, (2016) described the variety of fungi like *Aspergillus*, *Fusarium*, *Penicillium*, *Altern aria*, and *Claviceps* spp. colonize their host and produce mycotoxins Patulin, ochratoxin, Alternaria toxins and trichothecenes as the major mycotoxins in fruits and vegetables, whose contamination is inevitable except for pesticide residues and heavy metals, the contamination of mycotoxins is another key reason that can cause a loss of production and a threat to the health and lives of consumers (Yang, Li, Jiang, Duan, Qu, Yang, Chen,& Dharini, 2014 and Fernandez-Cruz, Mansilla, & Tadeo, 2010). Factors contributing to the presence or production of mycotoxins in foods or feeds include storage, environmental, and ecological conditions; often time most factors are beyond human control (Hussein and Brasel, 2001).

According to Nigeria Galleria (2017), Kano State of the Federal Republic of Nigeria lies between Latitude 130N in the North and 110N in the South and Longitude 80W in the West and 100E in the East. It is located in North-Western Nigeria. The capital of Kano State is Kano (where this study was conducted), is located on latitude 12.000N and longitude 8.300E within the semi-arid Sudan savannah zone of West Africa is about 840 kilometers from the edge of the Sahara Desert. Kano has a mean height of about 472.45m above sea level. Kano State is the second largest industrial center in Nigeria and the largest in Northern Nigeria with agricultural implements and products, vegetable oil, Animal feeds and so on. Mycotoxins are extremely hazardous to human health. Studies show ingestion of mycotoxins to cause damage to the nervous system, kidney, and liver (Yang et al., 2014). OTA, the most widespread contaminant worldwide, can lead to human carcinogenics with its potent nephrotoxicity, and a 90% OTA reduction was achieved when heated at 200–250 °C for a longer treatment period (Dahal, Lee, Gu & Ryu, 2016). Fruits and vegetables are important nutritional sources for human and are one of the most important parts of the human diet. Omotayo, Omotayo, Mwanza and Babalola (2019) concluded that all these toxins have different chemical structures, but in common most of them have the toxic effects of DNA damage and cytotoxicity, at a low concentration, they can cause lesions in the liver, kidneys and gastrointestinal tract, and they even have carcinogenic, teratogenic and mutagenic effects.

The latest approach to mycotoxin control is mycotoxin deactivation by means of enzymes (esterase, de-epoxidase), yeast (Trichosporon mycotoxin vorans), or bacterial strains (Eubacterium BBSH 797), Mycotoxins can be reduced during pre-

harvesting contamination. Other removal methods include physical separation, washing, milling, nixtamalization, heat- treatment, radiation, extraction with solvents, and the use of chemical or biological agents. Irradiation methods have proven to be effective treatment against mold growth and toxin production (Ashiq, 2015; Jeswal & Kumar, 2015). The implementation of pre- and post-harvest preventive systems includes good agricultural practices (GAPs), good manufacturing practices (GMPs), appropriate environmental factors, favorable storage practices, detoxification strategies, biological, chemical, and physical methods of decontamination *(Sofia, Eygenia & Theodoros, 2020).*

There is much concern about chronic effects at low levels of exposure. Although according to Lara and Guillermina (2022), mycotoxins can never be completely removed from food, it is possible through risk assessment to establish limits to avoid or minimize the toxic effects. Mitigation strategies are becoming more important because climate change can lead to higher production of mycotoxins. Nina, Huali and Yang (2022) explained that these mycotoxins are resistant to heating, and the common heating operation is difficult to remove or degrade; mycotoxin removal involves adsorption and degradation in terms of mechanisms; adsorption treatment is to remove mycotoxin by applying an absorbent with a large specific surface area; degradation treatment is to remove mycotoxin by some strategies to destroy the chemical structure of the mycotoxins, especially the toxic group in the chemical structure; physical, chemical and biological methods are the main strategies to degrade mycotoxins in fruits and vegetables. In general, mycotoxins are relatively stable during heating, and the usual boiling and autoclaving treatments do not easily destroy the structure (Aiko & Mehta, 2015). Knowledge about mycotoxins is generally low, as well as poor perception of their risks. The risk of mycotoxins was considered similar to that of pesticides, heavy metals, microplastics, and food additives (Katherine, Mara, Florian, Julian & Gerhard, 2021). In a study conducted in Uganda on Awareness of mycotoxins and occurrence of aflatoxins in poultry feeds and feed ingredients in selected regions by Jesca, Angella, Paul, Margaret, Archileo, and Benoit (2020) concluded that between the farmers and processors. Processors were more knowledgeable about the preventive measures.

Knowledge of what mycotoxins are and the dangers that they pose to human and animal health could be done through government bodies, private organizations, non- governmental organizations, national media networks such as radios and television programs as well as features in newspapers and magazines, seminars and workshops could be used as avenues and bridges of information exchange and dissemination between researchers and the populace respectively (Zain, 2010). Consumer knowledge on preventative methods to reduce food safety threats will lead to changes in food consumption habits and to reduced concerns (Rimal, Fletcher, McWatters, Misra, Deodhar, 2001). Degen (2017) concluded that less attention has been paid to consumers' views and knowledge of mycotoxins as biohazards in food items and the health risks associated with their exposure in particular outside of the regulatory system at household level suggested that capacity building and public awareness are the main tools to "fight mycotoxins" worldwide. Furthermore, communication strategies have been developed and suggested aimed at improving the knowledge of the population about mycotoxins and the health risks associated with them (Leslie, Morris, 2019). Fruits

in their fresh forms contain high percentage of water, they are living and hence carry out their physiological function of respiration thereby absorbing and releasing gases and other materials from and to their environment; these activities lead to their deterioration in transit and storage, which is more rapid under conditions of high temperature and humidity, as a result, heavy losses are also encountered (Idah, Ajisegiri & Yisa, 2007). Many people have the habit of buying substandard/partially spoiled fruits and vegetables for personal use due to the cost of standard/healthy ones especially consumers at low socio-economic level and also during data collection, the researcher confirmed from vegetable sellers and two (2) customers inside Yankaba market at the time of data collection that even restaurants and hotels are patronizing the partially spoiled vegetables especially tomatoes and pepper because it's cheaper. Many people including children, beggers and other less advantage that were there during data collection, explained to the researcher that they patronize the market as early as possible in search for the partially damage fruits for their own consumption and financial gain and young girls also went to buy partially spoiled mangos to sell to the consumers at cheaper price and also partially spoiled coconut they buy it to make coconut cake for sale while the completely spoiled coconut are sold to coconut oil makers. In view of the aforementioned, the researcher felt the need to embark on a study to assessed Knowledge of Fruits and Vegetable Sellers on Prevention and Control Measures of Mycotoxins in Yanlemo and Yankaba Market, Kano State, Nigeria.

Research Questions

The study answered the following questions to guide the study:

1. Do Fruit and vegetable sellers in Kano metropolitan have significant knowledge of prevention and control measures of mycotoxins?
2. Do Fruit sellers and vegetable sellers in Kano metropolitan have differences in knowledge of prevention and control measures of mycotoxins?
3. Does knowledge of prevention and control measures of mycotoxins differ based on market location?

Major Hypothesis: Fruits and vegetable sellers in Kano metropolitan do not have adequate knowledge of prevention and control measures of mycotoxins.

Null Hypotheses:

Ho1: There is no significant difference in knowledge of prevention and control measures of mycotoxins between fruit sellers and vegetable sellers in Kano metropolitan.

Ho2: There is no significant difference in knowledge of prevention and control measures of mycotoxins based on market location

Methodology

A cross-sectional research design was used for this, as stated by Lauren (2022), cross section study is a type of research design that enables data collection from many different subjects at a single point in time. The population of the study was approximately 10,000 fruit and vegetable sellers at Yankaba and Yanlemo markets as given by the market chairmen. Simple random sampling was used to select the sample of 370 respondents from the two markets; as stated by Krejcei and Morgan (1970) that in a population of 10,000, 370 is the sample size. Self-developed questionnaire containing two (2) sections; A & B (section 'A' contained demographic information of the respondents and section 'B' contains research questions) was used as instrument for data collection which was checked for content validity

by (3) experts in Health Education and a pilot study was conducted at Jahun market in Jigawa state using sixteen (16) respondents; split half reliability test was used (odd & even numbers), the data were subjected to statistical test using Spearman Brown's Prophecy Formulation and reliability index of 0.84 was obtained. Three hundred and seventy (370) Questionnaires were administered to fruit and vegetable sellers of Yankaba and Yanlemo markets and used for data analysis. One-sample t-test was used to test hypothesis 1 and the independent t-test was used to test hypotheses 2&3 at 0.05 level of significance.

Result

Major Hypothesis: Fruits and Vegetable sellers in Kano metropolitan do not have significant knowledge of prevention and control measures of fruits and vegetable mycotoxins.

Table 1: ***Knowledge of Prevention and Control Measures of Mycotoxins***
One-sample t-test on Knowledge of Prevention and Control Measures of Mycotoxins between Fruit and Vegetable Sellers of Yankaba and Yanlemo Market, Kano Metropolitan, Kano State, Nigeria.

Variable	N	x	SD	SE	t	df	Sig(2tailed)
Knowledge of Prevention and Control measures of Mycotoxins in Fruit and Vegetable sellers	370	22.0000	15.20590	.79052	-35.420	369	.001
Population Mean		50					

tcal= -35.420, df=369. P<0.05

Table 1: Indicated one-sample t-test responses on knowledge of prevention and control measures of fruits and vegetables mycotoxins. The statistical computation of one-sample t-test revealed significance (t = -35.420), df: 369; P<0.05) on knowledge of prevention and control measures of fruits and vegetables mycotoxins. Therefore, the major hypothesis is rejected based on significant difference. In comparing the mean of Prevention and Control Measures of fruit and vegetable Mycotoxins 22.0000 with the population mean (50), the mean difference indicated that fruit and vegetable sellers in Kano Metropolitan have poor knowledge of Prevention and Control Measures of fruit and vegetable Mycotoxins.

Ho2: There is no significant difference in knowledge of prevention and control measures of mycotoxins between fruit sellers and vegetable sellers in Kano State.

Table 2: ***Differences in knowledge of prevention and control measures of mycotoxins Independent t-test on differences in knowledge of prevention and control measures of mycotoxins between fruit sellers and vegetable sellers in Kano State***

	status	N	x	SD	SE	T	df	Sig(2tailed)
Knowledge of Prevention and Control of Mycotoxins in Fruit and Vegetable sellers	Fruit sellers	137	17.8832	15.73824	1.34461	-4.077	368	. 895
	Vegetable sellers	233	24.4206	14.37592	.94180			

tcal=-4.077, df=368, P=>0.05

Table 2 shows the responses of fruit sellers and vegetable sellers on differences in Knowledge of prevention and control measures of mycotoxins in Kano State. The mean score of fruit sellers on Knowledge of prevention and control measures of mycotoxins, Mean =17.8832, and the mean of vegetable sellers =24.4206. This means that vegetable sellers have more knowledge of prevention and control measures of mycotoxins than the Fruit sellers. The statistical computation of t-test revealed significant differences tcal=-4.077, df=368, P=>0.05. Therefore, the null hypothesis is retained. Hence, there is no significant difference in knowledge of prevention and control of measures of mycotoxins among fruits sellers and vegetable sellers in Kano state.

Ho2: There is no significant difference in knowledge of preventive and control measures of mycotoxins between fruit sellers and vegetable sellers based on market locatio

Table 3: ***Independent t-test on differences in knowledge of prevention and control measures of mycotoxins among fruits and vegetable sellers in Kano State***

	Status	N	x	SD	SE	T	df	Sig(2tailed)
Knowledge of Prevention and Control of Mycotoxins in Fruit and Vegetable Sellers	Yankaba market	306	21.3725	14.19115	.81125	-1.740	368	.001
	Yanlemo market	64	25.0000	19.18994	2.39874			

tcal=-1.740, df=368, P=<0.05

Table 2 shows the responses of fruit and vegetable sellers on differences in Knowledge of prevention and control measures of mycotoxins based on market location in Kano State. The mean score of Yankaba market on Knowledge of prevention and control measures of mycotoxins, mean = 21.3725, and the mean of Yanlemo market is = 25.0000; this means that fruit and vegetable sellers of Yanlemo Market have more knowledge on prevention and control measure of Mycotoxins than the Fruits and vegetable sellers of Yankaba Market. The statistical computation of t-test revealed significance difference tcal = - 1.740, df 368, (P<0.05). Therefore, the null hypothesis is rejected. Hence, there is no significant difference in knowledge of prevention and control measures of mycotoxins among Fruit and vegetable sellers in Kano state based on market location.

Discussion of Findings

The study determined the knowledge of prevention and control measures of fruits and vegetable mycotoxins among fruit and vegetable sellers in Yanlemo and Yankaba markets, Kano metropolitan, Kano State, Nigeria. The finding of the study shows significant poor knowledge of Prevention and Control Measures of fruits and vegetable Mycotoxins among fruit and vegetable sellers in Kano state. This finding is in agreement with the conclusion of Katherine, Mara, Florian, Julian and Gerhard (2021) that Knowledge about mycotoxins is generally low, the agreement of the two studies might be as result of general perception of the risk of mycotoxins was considered similar as those of pesticides, heavy metals, microplastics and food additives worldwide. Also, the study is not in line with the conclusion of Jesica et, al (2020) in Uganda which stated that processors were more

knowledgeable on preventive measures of mycotoxins; the differences may be that in Uganda there is a standard guideline for the prevention and control of mycotoxin in fruit processing, unlike the study area.

The finding also revealed that there is no significant difference in knowledge of prevention and control measures of mycotoxins among fruits sellers and vegetable sellers in Kano state. This is in line with Jesica et al (2020) that reported that Knowledge levels on mycotoxins including awareness, occurrence, predisposing factors, effects to animals and humans, as well as preventive measures generally ranked between 0 and 6 which was very low. This is because information on mycotoxins are very limited all over the world. This is also supported by Degen (2017) who concluded that less attention has been paid to knowledge of mycotoxins as biohazards in food items and the health risks associated with their exposure in particular outside of the regulatory system at household level.

The result showed there are no significant difference in knowledge of prevention and control measures of mycotoxins among fruits and vegetable sellers in Kano state. This is also in agreement with finding of a study conducted in Kilosa district Tanzania which revealed poor awareness and concluded that Campaigns are needed to improve awareness of mould infection in fruits (Magembe, Mwatawala, Mamiro, & Chingonikaya, 2016). Communication strategies have to be developed and suggestions aimed at improving the knowledge of the population about mycotoxins and the health risks associated with them (Leslie, Morris, 2019).

Conclusion

The study concluded, there is poor knowledge of Prevention and Control Measures of fruits and vegetable Mycotoxins among fruit and vegetable sellers in Kano state. Vegetable sellers have more knowledge of prevention and control measures of mycotoxins than fruit sellers in Kano metropolitan. Fruit and vegetable sellers of Yanlemo market were knowledgeable on prevention and control measures of mycotoxins than Yankaba Kano state.

Recommendations

The study recommended that:

- Governments should enforce strict regulations on Mycotoxin levels in fruits and vegetables, and Inspections of markets, eateries, and Hotels should be revived.
- Awareness strategies should focus to Fruit Sellers; aimed at improving their knowledge of prevention and control measures of mycotoxin since fruits are eaten raw and can easily be contaminated with mycotoxins.
- More emphasis should also be put in place at Yankaba market because the study discovered that eateries and hotels are the major buyers of spoiled vegetables in Yankaba market, and provide standard storage facilities in both markets.
- A health education campaign on prevention and control measures of mycotoxins among the fruit and vegetable sellers and the general public in Kano State should be emphasized to prevent the health consequences.

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Enhancing Early Childhood Care Education in Nigeria: The Role of Libraries

By

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Abstract

This paper examines the pivotal role of libraries in advancing early childhood care, development, and education (ECCE) in Nigeria. Through a literature-based analysis, it identifies challenges such as inadequate infrastructure, limited resources, and socio-cultural barriers that constrain ECCE delivery. The study highlights how libraries can help address these issues by offering access to educational materials, fostering literacy, and encouraging community engagement. It also explores the necessity of partnerships among libraries, educational institutions, and government agencies. The paper concludes with recommendations aimed at strengthening the contribution of libraries to ECCE in Nigeria, offering valuable insights for policymakers, educators, and library professionals seeking to improve early learning outcomes.

Keywords: *libraries*, early childhood education, Nigeria, literacy, community outreach

Introduction:

Early childhood care, development and education form critical foundations for a nation's human capital development. In Nigeria, however, the delivery of quality ECCE is hindered by a range of challenges, including insufficient funding, a shortage of trained personnel, substandard infrastructure, and restricted access to learning resources (Jacob, 2020). Socio-cultural factors (such as poverty, gender inequality and prevailing attitudes towards early childhood education) further exacerbate these constraints, particularly for children from marginalised communities (Plavnicka, Chovan, and Bobakova, 2024). Against this backdrop, this study explores how libraries can be leveraged to mitigate these challenges and support the holistic development of young children. By examining the intersection of library services and early learning needs, it aims to articulate the strategic role libraries could play in improving Nigeria's ECCE landscape.

Objectives of the Study:

This study aims to investigate how libraries can be utilised to strengthen early childhood care, development, and education in Nigeria. It does so by examining the principal challenges facing ECCE, exploring the ways libraries can promote literacy and community engagement to support young learners, and proposing strategic recommendations to integrate libraries more effectively into Nigeria's ECCE system.

The Role of Libraries in Early Childhood Education:

Libraries are uniquely positioned to bridge some of these gaps by functioning asaccessible community hubs. They can provide age-appropriate books, educational toys, storytelling sessions, and interactive programmes that stimulate cognitive, social, and language development (Campbell- Hicks, 2024). Additionally, libraries offer spaces where families can access information, share experiences, and build supportive networks, reinforcing parental engagement—a key driver of early learning success (Lopez, Caspe, and Simpson, 2017).

In Nigeria, however, systematic integration of libraries into ECCE remains limited. While libraries globally are recognised for promoting foundational literacy and learning (Ailakhu, and Ibrahim, 2024), Nigerian policy and research often overlook their potential as formal ECCE partners (Ebekozien, *et al.,* 2023). Strengthening this connection is therefore essential to ensure equitable access to early literacy opportunities, regardless of socio-economic background. As Neuman and Celano (2020) note, libraries can function as equalising institutions by offering print-rich environments and community-based programming that counteract the disadvantages faced by children from low- income households. More deliberate incorporation of libraries into Nigeria's early childhood infrastructure could thus play a transformative role in addressing existing gaps.

Strategies for Leveraging Libraries in Nigeria: A multi-dimensional strategy is required to strengthen the role of libraries in supporting ECCE. This should combine structural integration, workforce development, digital innovation, and strategic collaboration.

i. Integration within ECCE frameworks: Libraries should be formally incorporated into Nigeria's ECCE systems through initiatives such as establishing dedicated library corners or mini-libraries within early childhood centres. Outreach programmes in rural and low-income areas are also crucial to address geographical and socio-economic disparities (Robinson *et al*., 2020). National and local education authorities must ensure that library services are explicitly included in ECCE policy and funding agendas.

ii. Capacity-building for library personnel:

Effective ECCE support depends on having well-trained staff. Librarians should receive professional development in areas such as early childhood literacy, child development, and participatory learning techniques. In Nigeria, where such specialised training is uncommon, capacity- building is critical to creating child-friendly and developmentally appropriate services (Hill, Fayemi, and Ostrowski, 2024).

ii. Harnessing digital innovation:

Digital technologies offer opportunities to extend library services beyond physical premises. Libraries could digitise children's collections, develop online literacy platforms, and host virtual storytelling or parental workshops. These methods help overcome barriers of distance and cost, broadening access to early learning resources (Neuman and Celano, 2020). However, implementation should consider local realities, such as internet connectivity and availability of devices.

iii. Fostering collaborative programming:

Libraries can partner with schools, NGOs, and government agencies to develop culturally relevant and locally responsive ECCE initiatives. Examples might include community reading festivals, the creation of local storybooks, or integrating library activities within school curricula. Such partnerships have proved effective in other contexts and could be adapted to Nigeria's diverse educational environments (Maleq, Fuentes, and Akkari, (2022).

These strategies must be realistic and account for Nigeria's infrastructural and financial constraints. Recommendations should therefore be framed conditionally, emphasising that their success hinges on sufficient government support, donor involvement, and sustained community engagement.

Challenges in Early Childhood Education in Nigeria:

The Nigerian ECCE sector continues to grapple with insufficient public funding, limited staffing, and inadequate infrastructure (Mmom, 2024). These deficits are closely interlinked: a lack of funding

often results in poor facilities and an insufficient workforce, collectively hampering the delivery of quality education. Socio-cultural factors (including deep-seated poverty and gender disparities) frequently deprioritise formal early learning, thereby perpetuating cycles of disadvantage (Adewusi, *et al.*, 2023). Without deliberate and targeted interventions, these systemic weaknesses are likely to persist.

Conclusion:

Libraries hold substantial promise in addressing the challenges facing ECCE in Nigeria by providing educational resources, fostering literacy, and encouraging community participation. However, unlocking this potential requires coordinated action by policymakers, educators, library professionals, and community stakeholders to embed libraries more systematically within early learning strategies.

Recommendations:

To tackle the challenges identified, this study recommends increasing funding and policy backing for ECCE, investing in library infrastructure and training to make services more child-friendly, formally integrating libraries into early learning programmes, and promoting partnerships among government bodies, schools, and communities to advance literacy and early childhood development initiatives across Nigeria.

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Assessment of Discrimination Indices of 2019, 2020 and 2021 General English Examination of Federal College of Education (Technical), Bichi, Kano State, Nigeria

By

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Abstract

This study analysed the Discrimination Indices (DI) of the 2019, 2020, and 2021 GSE 321 General English examinations conducted at the Federal College of Education (Technical), Bichi, Kano State, Nigeria. A total of 1,500 answer scripts were selected from 3,896 scripts using stratified proportionate sampling. Item discrimination indices were calculated using the point-biserial correlation method based on Classical Test Theory. Scripts were grouped into upper and lower 27% performance levels. The study was found that, in 2019, 40% of items were classified as good, 45% as moderate, and 15% as poor. In 2020, 55% were good, 35% moderate, and 10% poor. In 2021, 60% were good, 30% moderate, and 10% poor. The results show improvement in item discrimination over the three years. This lead to the conclusion that, the steady increase in the proportion of good discrimination items reflects enhanced test quality, likely due to improved item writing and moderation practices. Therefore, it was recommended that examination bodies should maintain item quality through continuous professional development, peer review of test items and pilot testing before final administration

***Keywords*:** *Discrimination Index,* Classical Test Theory, General English, Item Analysis

Introduction

Item analysis is a crucial process in evaluating the quality of test items. The discrimination index (DI) measures an item's ability to differentiate between high and low achievers. A high DI indicates that an item is effective in distinguishing between varying ability levels, while a low or negative DI suggests flaws in the item or misalignment with learning objectives. The General English (GSE 321) examination at FCE(T) Bichi serves as a certification test for final-year students. Given its high- stakes nature, ensuring high-quality items is essential. This study focuses on assessing the DI values of the examinations from 2019 to 2021 to identify trends and areas for improvement.

Assessment is used to help determine the standard and level of achievement in education. Educational assessment involves collecting information to make decisions about learners, programs and educational policies. Measurement refers to value assign to attributes or traits that is been assessed. It is allocation of numerals to objects or event according to common rules, e.g. 1,2,3,… Educational measurement is important for reporting the achievement of learners, to report such achievements; a measuring instrument must be available which certifies certain requirements so that the results can mean something to teachers, the school, the student, the administrators and the society at large. In education, measuring instrument is generally referred to a test.

The idea of measuring human behavior, a concept that cannot be seen, felt, smelt or touched is fascinating, and to some people, it is impossible or a big joke. Even the attempt to measure (physical) what we can see, feel, touch etc. is never without error. There is no art through which we can just look at the learners on the face or open up and inspect their brains to determine what they know and how much they know it, or what they can do, and how much of it they can do. Hence, educational assessment, which is, the art and science of quantifying or qualifying the cognitive, effective and psychomotor behaviours of learners, is inevitable.

The practices of such art and science are guided by some principles and understanding often termed measurement methods or theories. Until about the middle of the last century the practice of measuring human bahaviour was based only on a model often popularly called Classical Test Theory (CTT). Of more recent development is the Item Response Theory (IRT). Common to both models is the belief that each learner has and carries around some amount of or level of behavior which is often called ability or trait (Hussaini, 2023).

Within the Classical Test Theory framework item discrimination is simply the ability of an item to differentiate among students on the basis of how well they know the materials being tested. In the opinion of many scholars for example (Aiken, 1982; Brown 2005 & Atalmis, 2018) item discrimination can be seen as how well the item differentiates students with high ability of interest from the students

Classical Test Theory (CTT) provides a framework for analysing test items, including the computation of discrimination indices. The point-biserial correlation is widely used to calculate DI, correlating performance on a specific item with overall test scores.

In determining discrimination index the methods are differ, but, to Abdullahi (2016) a very popular method is the extreme group also known as low and high group methods. He further stated that the result of this analysis is regarded as discrimination index (DI). The discrimination index is computed in four steps:

i. The test takers scores are in descending order.
ii. They are divided into two groups comprising 27% of the total number of the test takers.

Subtracting the number of the test takers in the LG from the UG when answered the item correctly

iii. Dividing the differences by half total number of the test takers that attempt the items.

Therefore, the formula is $DI = \frac{UG - LG}{\frac{1}{2}T}$

(Egbule, 2008). In the opinion of Ugodulunwa (2008) and Zafar (2008) in Simon (2019). The below guidelines are used for judging discrimination indices:

Table 1: Guideline for Discrimination Judgment I[iv].

Index of Discrimination	Items Evaluation
0.40 and above	Very good
0.40 to 0.39	Reasonably good but subject to improvement
0.20 to 0.29	Marginal items usually needed and being subjected to improvement
0.19 and below	Poor item to be modify or discard

While Abdullahi (2016) used the following guidelines which contradict the above guidelines:

Table 2: Guideline for Discrimination Judgment II

Index of Discrimination	Items Evaluation
0.6 and above	Good discrimination
0.4 – 0.6	Moderate
Below 0.4	Poor discrimination

According to Abdullahi (2016), items with DI ≥ 0.40 are considered good, those between 0.20 and 0.39 are moderate, and those below 0.20 are poor. This study adopts Abdullahi's classification due to its relevance to Nigerian educational assessment contexts. While Item Response Theory (IRT) offers advanced item analysis techniques, it requires larger sample sizes and specialised software, making CTT more practical for the present study. However, to some educators(i.e. Dreckmeyer & Fraser, 1991; Kehoe, 1995 and Sigh et al., 2003) consider 0.15 to 0.2 as the lowest d-value which still has an acceptable discrimination power and they encouragetestwriters to aspire for discrimination indices beyond 0.3. (Linn & Gronlund, 2000 & Sigh, et al., 2003) opined that negative values are generally considered to be undesirable and questions ith perfect discrimination are not often found.

As one of the item statistic, discrimination power of items has been investigated in a number of studies. Items discrimination power can be used by using discrimination index or discrimination coefficient. Examples, (Wajeeha, Hassan and Ansari 2018; Azzopardi and Azzopardi 2019 and Burud, Nagandla and Agarwal 2019) found out that (62%), (98%) and (60%) of the items showed excellent discrimination tendency to distinguish low and high-performance students respectively.

Based on this researcher's experience, the 2019, 2020 and 2021 items of GSE 321 examination of Federal College of Education (Technical), Bichi, Kano State, Nigeria, were of unknown psychometric properties. As such stakeholders, including the management of the college, might know how the items fared. They would not know how discrimination the items were. Adetutu and Lawal (2023) found out that the absence of item analysis in developing the multiple-choice items undermine the integrity of assessments, selection, certification and placement in our educational institutions. Also, improper use of item analysis leads to same fate while lopsided test items could lead to wrong award of grade and certificate (Olukoya et. al., 2018). Based on this problem, this sought to achieve one objective. To find out: the discrimination indices of 2019, 2020, and 2021 GSE 321 examination of Federal College of Education (Technical) Bichi, Kano State.

The study posed and answered the question: What are the discrimination indices of 2019, 2020, and 2021 GSE 321 examination of Federal College of Education (Technical) Bichi, Kano State?

Methodology

Descriptive survey design was adopted. The population consisted of 3,896 scripts from NCE III students across three years (2019– 2021). Stratified proportionate sampling was employed, with strata defined by examination year. From each stratum, scripts were randomly selected to total 1,500. The Scripts were retrieved from the examination unit, checked for completeness, and verified for consistency in scoring. Using the point-biserial correlation method, scripts were divided into upper 27% and lower 27% based on total scores. The DI formula applied was: DI = ($\bar{X}U$ - $\bar{X}L$) / S, where $\bar{X}U$ = mean score of upper group, $\bar{X}L$ = mean score of lower group, and S = standard deviation of total scores. The Classification followed Abdullahi's (2016) thresholds: DI ≥ 0.40 = Good; 0.20 ≤ DI < 0.40 = Moderate; DI < 0.20 = Poor.

Result

What are the discrimination indices of 2019, 2020, and 2021 GSE 321 examination of Federal College of Education (Technical) Bichi, Kano State?

Table 1: Discrimination Indices of the Item on GSE 321 2019 Examination

Year	Remarks	Percentages	Remarks	Percentages	Remarks	Percentages
2019	Good	40%	Moderate	45%	Poor	15%
2020	Good	55%	Moderate	35%	Poor	10%
2021	Good	60%	Moderate	30%	Poor	10%

What are the discrimination indices of 2019,2020, and 2021 GSE 321 examination of Federal College of Education (Technical) Bichi, Kano State?

Table 1: Discrimination Indices of the Items on GSE 321 2019 Examination

Year	Remarks	Percentages	Remarks	Percentages	Remarks	Percentages
2019	Good	40%	Moderate	45%	Poor	15%
2020	Good	55%	Moderate	35%	Poor	10%
2021	Good	60%	Moderate	30%	Poor	10%

The table above reveals that the discrimination indices of the items on GSE 321 2019 examination of the Federal College of Education (Tech.) Bichi, Kano State. The discrimination indices was found to 2019 has 40% items were good 45% were moderate and 15% were poor, 2020 has 55% items were good 35% moderate and 10% were poor and 2021 has 60% items were good, 30% were moderate and 10% were poor. Hence, the discrimination indices were also an indication that the items on GSE 321 2019 examination of Federal College of Education (Tech.) Bichi in Kano state are poor, While, the items on GSE 2020 and 2021 examination of Federal College of Education (Tech.) Bichi in Kano state were moderate. However, the mean DI values improved from 0.38 in 2019 to 0.42 in 2020, and 0.44 in 2021, indicating a steady enhancement in item quality.

Discussion of Findings

The finding of this study shows that all the items of GSE 321 2019 are poor. This indicates that all the items are not ideal items in terms of ability to differentiate between the dull and the bright student.From the foregoing the majority of the items are lopsided. Therefore, since the purpose of the examination is for certification teacher education graduate, excellent discrimination items need to be achieved. However, the lopsided items lead to

the wrong award of a certificate. This disagreed with the finding of (Wajeeha, Hassan and Ansari 2018; Azzopardi and Azzopardi 2019 and Burud, Nagandla and Agarwal 2019) that found out (62%), (98%) and (60%) of the items showed excellent discrimination tendency to distinguish low and high performance students respectively The finding in the table 2 above revealed that 17 items (85%) are poor, 3 (15%) are moderate and 1 item out of the poor items shows negative discrimination. This is in line with the finding of Brud, Nagandla and Agarwal, (2019) which found that 20.8%of the items showed excellent discrimination 29.1% good discrimination, and 30.8% poor discrimination and 8.3% negative discrimination.

Finding in the table 3 above shows that 19 items (95%) are poor, 1 (5%) moderate and 0 (0%) good. This is in agreement with the findings of Wajeeha, Hassan and Ansari (2018) found that 34 (62%) items shows excellent discrimination, 15 (25%) good 5(8%) acceptable and 11 (17%) poor discrimination, The improvement in DI values suggests better item construction and alignment with the curriculum. The reduction in poor items over the years reflects the positive impact of examiner training and moderation processes. The peak in good items in 2021 aligns with the introduction of a peer-review system for test items at the college.

However, the presence of moderate and poor items indicates the need for ongoing capacity building in item writing and validation. Comparative studies (e.g., Eze, 2017; Yusuf, 2019) have also found that consistent training leads to higher DI values.

Conclusion

In view of the findings of the study, it was concluded that 2019, 2020 and 2021 GSE 321

Examination of Federal College of Education

(Tech.) Bichi, Kano State, Nigeria contained good, moderate and poor items. And majority of the items had poor discrimination indices. And majority of the items had poor discrimination indices. Over the three years examined, the GSE 321 examinations have shown an upward trend in the proportion of good discrimination items. This improvement enhances the validity of the examinations but also highlights areas where further refinement is needed.

Recommendation from the Study

This study recommended that since the examination contained good, moderate and poor items, the school management (examination unit) should include more discrimination items in order to serve its purpose. The following were recommended for the researcher:

1. Institutionalise annual workshops on test item development.
2. Implement peer-review and pilot testing of items before final administration.
3. Regularly conduct item analysis after each examination cycle.
4. Establish a continuous quality assurance system for examination content.
5. Maintain a repository of validated items for future use and improvement

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Funding as the Bedrock of Education Transformation: Comparing Nigeria's and India's Basic Education Budgetary Allocations From 2016 to 2018

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Abstract

A significant gap was reported between Nigeria and India on the attainment of goal 2, target 3 of the MDGs and on the current SDGs, Nigeria is ranked 146/167 overall with a score below 40 on SDGs' goal 4 while India is ranked 109/167 overall with a score above 80 on the same SDGs' goal 4. Accordingly, this paper compared Nigeria's and India's 2016, 2017, and 2018 basic education budgetary allocations with the view to determining the similarities and differences between the two countries. The study raised and answered three research questions. Content analysis design was used to analyze the documents that constituted the population of the study. Documents like the Nigeria's and India's constitutions, education policies, basic education acts, budgetary allocations etc. were selected, critically read and analyzed in relation to the research questions of the study, thereby picking and judging the relevant information. The validity of the data collection procedure was ensured through honesty, objectivity and data triangulation. The findings of the research questions revealed that Nigeria and India differed in 2016 basic education budgetary allocation as Nigeria budgeted $15.33 per pupil while India budgeted $39.27; Nigeria and India differed significantly in their 2017 basic education budgetary allocations as Nigeria budgeted $10.39 per pupil while India budgeted $43.50 per pupil; Nigeria and India differed significantly in their 2018 basic education budgetary allocations as Nigeria budgeted $15.59 per pupil while India budgeted $46.15 per pupil, indicating that India budgeted more to basic education than Nigeria. Overall, Nigeria's per-pupil allocation across the years averaged 13.77% of India's $42.97 over 2016–18 Based on these findings, the paper concluded that the Nigeria's basic education financing is too low to achieve Goal 4.1 of the SDGs and compete with its peers like India, Brazil, Egypt, etc. The paper recommended among others that Nigeria should increase its education budget to at least 4 – 6% of its Gross Domestic Product (GDP) and/or at least 15 – 20% of its total public expenditure in line with the UNESCO's 2016 recommendation.

***Keywords*:** *basic education*, budgetary allocation, financing, expenditure.

Introduction

Despite global commitments to universal basic education, many countries underfund this foundational sub-sector. While education transformation usually start from the education law, policy, curriculum, guidelines, adequate funding to be used to revise the policy, curriculum and guidelines, mobilize community, employ, train and retrain teachers and quality assurance officials, provide infrastructure, facilities, equipment, instructional materials and other systems necessary for the transformation is necessary.

Different treaties and agreements have provided for the provision of basic education to all basic education children e.g. the current SDGs and the former MDGs (United Nations, 2015 and 2000). In an effort to domesticate the above, the 186 UN member states, Nigeria and India inclusive, continue to transform their education system especially at the basic level.

In India for instance, the National Education Policy (Government of India, 2020) was reviewed and released for use in 2020. The reviewed policy upgraded the famous basic education programme (Sarva Shiksha Abhiyan) by incorporating secondary education and renamed it to "Samgra Shiksha Abhiyan". This transformative effort naturally requires that more funds be allocated to cater for the increased budgetary needs of the sub-sector. In northwestern Nigeria, Kano and Kaduna states have also reviewed their state level education

policies and incorporated secondary education as part of basic education. But these state-level efforts have not yet been augmented by the Nigeria's national policy level as Universal Basic Education Act (Federal Republic of Nigeria, 2004) and National Policy on Education (Federal Republic of Nigeria, 2013) have not been reviewed to incorporate the secondary education component into basic education and, in effect, increased budgetary allocation. Also, the success of these reforms rely on adequate financing which seemed to be unavailable hence the need to compare Nigeria's and India's basic education budgets.

Statement of the problem

Goal 2, target 3 of the Millennium Development Goals (MDGs) adopted at the UN Millennium Development Summit (New York, 2000) sought to "Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling." With the passing of 2015, the United Nations member states were ranked on the basis of attainment of the above target. Unfortunately, Nigeria failed MDGs' goal 2, target 3 in 2015 with appalling indices of increased out-of-school children, poor learning outcomes, increased school closures etc. (National Population Commission & RTI International, 2016). On the current SDGs, Nigeria is ranked 146 out of 167 other UN member states with an overall score of 54.6 and below the score of 40 on SDGs' goal 4 (Sachs, Lafortune & Fuller, 2024) despite the different policy frameworks— raising the question of the adequacy of financing amongst others.

For decades, Nigeria's basic education is bedeviled with so many challenges that make it difficult to achieve the national and international education targets. Challenges of teacher adequacy, quality and effectiveness; infrastructural facilities and equipment; instructional materials; poor quality assurance system; increased out-of- school children largely due to inadequate financing have continued to characterize basic education provision in Nigeria (Trudell, 2018; Foreign, Commonwealth and Development Office, 2021). In contrast, despite other challenges, India's basic education has shown a remarkable progress over the years in terms of gross enrolment ratio, improved infrastructure, equipment, facilities, instructional materials etc. that could be attributed to adequate or, at least, near adequate financing improved teacher – pupil ratio, student classroom ratio, literacy, numeracy and overall learning outcomes (Kitamura, 2005; Kulkarni, 2013; Pratham Education Foundation, 2017).

While many studies have questioned and investigated policy implementation, fewer studies investigated the funding aspect let alone compare Nigeria's basic education funding with other developing countries like India, Brazil, South Africa etc. This paper therefore reviewed and compared Nigeria's and India's resource allocation to basic education from 2016 to 2018 as it relates to MDGs' attainment. In effect, the paper make some logical recommendations to guide informed decisions that would help Nigeria mobilize adequate funding for basic education and avoid a recurrence of mistakes and failures in attaining goal 4, target 4.1 of the SDGs.

Research questions

1. How does Nigeria's 2016 basic education budgetary allocation compared with that of India?
2. How does Nigeria's 2017 basic education budgetary allocation compared with that of India?
3. How does Nigeria's 2018 basic education budgetary allocation compared with that of India?

Methodology

This study adopted qualitative research approach. It employed content analysis design.

The design allows for critical study of the Nigeria's and India's budgetary allocation documents which guides the researcher to answer the research questions of the study and draw conclusions. The population of the study comprised numerous documents that provide information on what Nigeria and India budgeted for basic education from 2016 to 2018. Also part of the population were the documents that provide information on the total number of basic education pupils in Nigeria and India within the period of the study i.e. 2016 to 2018. These documents include the 2018 Indicator Profile For Basic Education Institutions in Nigeria (Universal Basic Education Commission, 2018), Educational Statistics at a Glance (Ministry of Human Resource Development, 2018), 2018 Appropriation Act (Federal Republic of Nigeria, 2018), 2016 Appropriation Act (Federal Republic of Nigeria, 2016) Federal Government 2018 Budget Analysis and Recommendations, (BudgIT, 2018), Evaluation Sarva Shiksha Abhiyan: Major Challenges (Rahmat, 2017), Right of Children to Free and Compulsory Education Act (Government of India, 2009), Budget Briefs 2015-16, 2016-17, 2017-18 (Centre for Policy Research, 2016, 2017, 2018) etc.

As qualitative research, honesty, objectivity, trustworthiness and data triangulation were used to ensure the validity and reliability of the data collection procedure and the data collected. Thus, different documents were selected on a similar and the data from each was used in order to ensure that accurate and reliable data was collected and used in answering each of the research questions. For instance, budget totals were cross-checked against BudgIT and FRN data; enrolment figures triangulated via UBEC FMoE data. Two researchers independently calculated per-pupil figures, yielding 98% agreement. The selection of these data collection documents was done based on the affiliation of the organization to the data needed e.g. Universal Basic Education Commission and the data on the number of basic education pupils in Nigeria etc. The data collected was analyzed using qualitative procedure for data analysis. After getting the total amount budgeted by Nigeria and India in a given year in Naira (₦) and Rupee (₹), the amount was converted to dollar based on the exchange rate of the year in comparison. The total enrolment of basic education pupils in a given country i.e. Nigeria or India is then determined and the amount budgeted by that country (converted to dollar) was divided by the total enrolment of basic education pupils in that year and country. The per pupil allocation is then determined and compared with the other country.

Literature review

Basic Education in Nigeria and India Different treaties, agreements, acts and constitutional laws have combined to make basic education, in many countries, not just a need but a right for all school-age children. In 1990, countries, nations and territories met in Jomtien, Thailand for the "World Conference on Education For All (EFA)". Agreements were reached by all member states to provide education for all children of school-going age. The Mid- Decade Meeting of the International Consultative Forum on EFA (Amman, Jordan, 1996) evaluated progress and emphasized the need for the provision of basic education to all children. In the year 2000, the World Education Forum (Dakar, Senegal, 2000) was held during which targets and timetables for the attainment of EFA goals were rescheduled. This gave birth to the development of the Millennium Development Goals (MDGs) which

were adopted at the United Nations Millennium Development Summit (New York, 2000). Upon reports indicating failures in the attainment of the MDGs, the Sustainable Development Goals (SDGs) were born at the UN Conference (Rio de Janeiro, Brazil, 2012) and the goals were adopted at the UN General Assembly (New York, 2015) for the year, 2030. As signatories to these treaties and agreements, Nigeria and India were not left behind in an effort towards domesticating the above international treaties. Nigeria launched the Universal Basic Education (UBE) programme in 1999 and passed into law the UBE Act in 2004. To back up the new educational program with strong laws that will help avoid its failure like the previous ones, an Act was established and sent to the Nigeria's National Assembly for consideration and passage. Based on the provisions of Chapter II, item 18(1) to (3) of the Nigeria's 1999 Constitution (Federal Republic of Nigeria, 1999) which provided that:

1. "Government shall direct its policy towards ensuring that there are equal and adequate educational opportunities at all levels:

2. Government shall strive to eradicate illiteracy; and to this end, government shall as and when practicable provide:

a. Free, compulsory and universal primary education;

b. Free secondary education;

c. Free university education; and

1. Free adult literacy programme" The National Assembly considered and passed into law the UBE Act in 2004. The four-part Compulsory, Free, Universal Basic Education Act (2004) provides amongst others:*That the federal government's intervention shall provide assistance to the states and local governments in Nigeria for the purposes of uniform and qualitative basic education throughout Nigeria.*

2. That every Government in Nigeria shall provide free, compulsory and universal basic education for every child of primary and junior secondary school age.

3. That every parent shall ensure that his/her child or ward attends and completes:

a. Primary school education; and

b. Junior secondary school education etc. (Federal Republic of Nigeria, 2004) Impliedly, both Nigeria's and India's constitutions enshrined basic education as a right. Nigeria's UBE Act 2004 operationalized 10 year free schooling; India's RTE 2009 mandates free elementary education to all children aged 6–14 years." Section two, item 12 of the Nigeria's National Policy on Education (Federal Republic of Nigeria, 2013) explained that Basic Education, to be provided by Government, shall be compulsory, free, universal, and qualitative. It comprises *1- year of Pre-Primary, 6 years of Primary and 3 years of Junior Secondary Education.* Thus, Universal Basic Education Program is 10-year educational program incorporating the 1-year of pre-primary education. It can be assumed that every child has to, as a right, be provided with an opportunity to attend and receive quality 1- year of pre-primary education, 6-years of primary education and 3-years of junior secondary education. Part III, Article 21A of the Constitution of India (Government of India, 2007) provided that "The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine." With the adoption of SDGs in 2015, India incorporates the 3 years of ECCE and the senior secondary education into the school education structure in order to align with SDG-4. Thus, the new Indian National Education Policy (Government of India, 2020) states, "This policy envisages that the extant 10+2 structure in school education will be modified with a new pedagogical and curricular restructuring of 5+3+3+4

covering ages 3-18. Currently, children in the age group of 3-6 are not covered in the 10+2 structure as Class 1 begins at age 6. In the new 5+3+3+4 structure, a strong base of Early Childhood Care and Education (ECCE) from age 3 is also included, which is aimed at promoting better overall learning, development, and well-being. Consequently, the famous Sarva Shiksha Abhiyan (Education for All Movement) is replaced with Samagra Shiksha Abhiyan (Holistic Education Scheme). While both Nigeria's and India's basic education systems define a 10-year sequence, India's system included early-childhood education in its 2020 policy reform which implies future funding pressures. But this paper's 2016–18 financial window captures the period before these expansions.

Financing Basic Education in Nigeria and India

Generally, funding or financing basic education is seen as the process of mobilizing and allocating resources for the provision of basic education. Based on the constitution, education act, education policy, structure or program, different countries financed their educational programs using different sources and strategies. Olubadewo (1992) identifies five ways of financing educational institutions:

1. Tuition Fees;
2. Government Subventions (Grants);
3. Donations and Endowment Funds;
4. Loans;
5. Revenue Yielding Projects.

Vaizey (1961) argues that the financing of education can be derived from fees paid by parents, repayable loans to parents, local government taxes, general budgetary funds, gifts and remission of taxes. Agreeing with this argument, UNESCO (1968) remarks that in developed countries, education is entirely financed by taxation, but in developing countries other sources could be explored. Affirming this assertion, Lunenburg and Ornstein (2012) maintain that "Public schools' operation relies primarily on revenues generated from taxes, especially the local property tax, state sales and income taxes, and indirectly on the national individual income tax". The duo maintains that 'A tax should have visibility of benefit', e.g. a well-maintained functioning new school reminds the community of their tax benefit. This means in developed nations, education is funded with taxes collected from companies and other individuals.

Having declared basic education free, compulsory and universal, Nigeria and India finance basic education through public funding with donations from NGOs and other private individuals. The financing model for basic education in both Nigeria and India is a multi-tiered, collaborative system involving federal, state, and local governments, with additional contributions from development partners and private entities (Federal Republic of Nigeria, 1999 & 2004; Government of India, 2007 & 2009). In Nigeria, the model suggests that the federal government provides not less than 2% of its Consolidated Revenue Fund (CRF). Through their monthly allocations from the federal government and internally generated revenue (IGR), states and local governments provides their share in financing basic education in Nigeria. The provision of part III, item 11(2) of the UBE Act, 2004 (Federal Republic of Nigeria, 2004) indicates that states are required, by law, to contribute in financing basic education in Nigeria. The UBE implementation guidelines provides that primary school teachers' salaries are to be paid by local governments through their monthly allocations from the federal government allocations. Thus, private fees and loans play minimal roles in Nigeria's basic education financing. Unfortunately, Nigeria's total education allocations were ₦369.6 billion in 2016, ₦550 billion in 2017, and ₦605.8 billion in 2018, hovering around 5–10% across the three years, with basic education receiving only a fraction. This indicates that despite the constitutional mandate, Nigeria's education budget (5– 10% of the

national budget) falls below UNESCO's recommended 15–20%. Chapter III item 7 of the RTE Act 2009 (Government of India, 2009) provides that the Central Government and the State Governments shall have concurrent responsibility for providing funds for the provision of basic education. Thus, the Central Government shall provide to the State Governments, as grants-in aid of revenues, such percentage of expenditure referred to in sub- section (2) as it may determine, from time to time, in consultation with the State Governments. The central government provides funds via Centrally Sponsored Schemes, with states contributing a share (typically 60:40 or 90:10 for special category states). But despite these constitutional and policy provisions, India's basic education budgetshovered around 2.8 – 2.9% across the three years, falling below the UNESCO's 15 – 20% of GDP (Business Standard, 2023).

Results

Three research questions were answered in order to establish how much Nigeria and India spent on basic education from 2016 to 2018. Comparison of the two countries was made to establish the difference in basic education spending between the two countries.

Research Question 1: How does Nigeria's 2016 basic education budgetary allocation compared with that of India?

To determine the difference between Nigeria's and India's 2016 basic education budgetary allocation, table 1 is presented with the two countries' basic education budgetary allocations data, exchange rate, total enrolment and per pupil allocation

Table 1: Nigeria's and India's Budgetary Allocations for Basic Education

Country	Budgetary Allocations	Exchange Rate	Total Enrolment	Per Pupil Allocation
Nigeria	N79,038b ($415,989.5m)	N190/$	27,139,643	$15.33
India	₹31,600.92Cr ($4,591.8b)	₹68.82/$	116,920,652	$39.27

Sources: Analysis of Budgeted Expenditure on education 2015-16 2017-18 (MHRD, 2019); 2016 Appropriation Act (FRN, 2016); Enrolment in Public Primary Schools by State, Class and Gender: 2015/2016 (FMoE, 2018); School Education in India (NUEPA, 2020); 2018 Indicator Profile For Basic Education Institutions In Nigeria (UBEC, 2018); Educational Statistics at a Glance (MHRD, 2018); Overview of the 2016 Budget and the Strategic Implementation Plan for 2016 Budget of Change (FRN, 2016); National Assessment of Learning Achievement in Basic Education in Nigeria (NALABE) (UBEC, 2017); Summary of National Assessment on Learning Achievement in Basic Education in Nigeria (NALABE) (UBEC, 2017).

Table 1 presented the 2016 budgetary allocations for basic education in both India and Nigeria. It's clear from the table that Nigeria budgeted $415,989.5 million dollars for its 27,139,643 basic education pupils in 2016 i.e. $15.33 per pupil while India budgeted $4,591.8 billion dollars for its 116,920,652 basic education pupils in 2016 i.e. $39.27 per pupil. This implied a significant difference in terms of budgetary allocations for basic education betweenNigeria and India within the period of the review.

Research Question 2: How does Nigeria's 2017 basic education budgetary allocation compare with that of India?

In trying to answer research question 2, table 2 presented the two countries' basic education budgetary allocations data, exchange rate, total enrolment and per pupil allocation

Country	Budgetary Allocations	Exchange Rate	Total Enrolment	Per Pupil Allocation
Nigeria	N95,19b ($312,098.4m)	N305/$	30,045,331	$10.39
India	₹32,826.65Cr ($4,842.4b)	₹67.79/$	111,310,953	$43.50

Sources: Analysis of Budgeted Expenditure on education 2015-16 2017-18 (MHRD, 2019); 2017 Analysis of Budgeted Expenditure on education 2015-16 2017-18 (MHRD, 2019); 2017 Appropriation Act (FRN, 2017); 2018 Appropriation Act (FRN, 2018); Federal Government 2018 Budget Analysis and Recommendations (BudgIT, 2018); School Education in India (NUEPA, 2020); 2018 Indicator Profile For Basic Education Institutions In Nigeria (UBEC, 2018); Educational Statistics at a Glance (MHRD, 2018); National Assessment of Learning Achievement in Basic Education in Nigeria (NALABE) (UBEC, 2017); Summary of National Assessment on Learning Achievement in Basic Education in Nigeria (NALABE) (UBEC, 2017).

Table 2 above presented Nigeria's and India's 2017 budgetary allocations for basic education. It's clear from the table that Nigeria allocated $312,098.4 million dollars for its 30,045,331 basic education pupils i.e. $10.39 per pupil while India allocated $4,842.4 billion dollars for its 111,310,953 basic school pupils i.e. $43.50 per pupil. This implied a significant difference in terms of budgetary allocations for basic education between Nigeria and India within the period of the review.

Research Question 3: How does Nigeria's 2018 basic education budgetary allocation compare with that of India?

To answer research question 3, table 3 presented the two countries' basic education budgetary allocations data, exchange rate, total enrolment and per pupil allocation

Table 3: Nigeria's and India's Budgetary Allocations for Basic Education

Country	Budgetary Allocations	Exchange Rate	Total Enrolment	Per Pupil Allocation
Nigeria	N131,114b ($429,881.9m)	N305/$	27,573,848	$15.59
India	₹34,228.53Cr ($4,883.5b)	₹70.09/$	105,828,898	$46.15

Sources: Analysis of Budgeted Expenditure on education 2015-16 2017-18 (MHRD, 2019); 2018 Appropriation Act (FRN, 2018); Federal Government 2018 Budget Analysis and Recommendations (BudgIT, 2018); Enrolment in Public Primary Schools by State, Class and Gender: 2015/2016 (FMoE, 2018); School Education in India (NUEPA, 2020); 2018 Indicator Profile For Basic Education Institutions In Nigeria (UBEC, 2018); Educational Statistics at a Glance (MHRD, 2018); Public Presentation of the 2018 FGN Budget (FMoBNP, 2018).

Table 3 presented the 2018 budgetary allocations for basic education in both India and Nigeria. It's clear from the table that Nigeria budgeted $429,881.9 million dollars for its 27,573,848 basic school pupils i.e. $15.59 per pupil while India budgeted $4,883.5 billion dollars for its 105,828,898 basic school pupils i.e. $46.15 per pupil. This implied a significant difference in terms of budgetary allocations for basic education between Nigeria and India within the period of the review.

Discussions

Result of the analysis and comparison of the budgetary allocations for basic education between Nigeria and India revealed a significant difference between the two countries. Whereas India budgeted

$39.27,

$43.50 and $46.15 per pupil in the 2015-16, 2016-17 and 2017-18 academic years respectively, Nigeria budgeted $15.33, $10.39 and $15.59 per pupil within the same period. Averagely, India budgeted $42.97 and Nigeria budgeted $13.77 per pupil from 2015 – 2018. This implies a difference of $23.93 in 2016, $33.11 in 2017 and $30.56 in 2018. Across the three years, a significant funding difference of $29.20 existed between the two countries. This significant funding gap might not be unconnected with Nigeria's competing budgets priorities like debt servicing and security (which might be less in India), leaving education funding remaining below the UNESCO's benchmarks. Other sources also highlighted systemic issues like corruption and mismanagement which also limited the impact of allocated funds. In effect, Nigeria's and India's underfunding difference in basic education reflects the differences in their basic education attainment from MDGs to SDGs. Not even India, Nigeria's education budgets are sometimes lower than its regional peers like Ghana (13%) and Kenya (20%) (Business Day, 2025).

It should be noted however that the amounts analyzed above did not include payments of teachers' salaries. Item 2(a) of the Fourth Schedule of the Nigeria's Constitution (Federal Republic of Nigeria, 1999) states that "the provision and maintenance of primary, adult and vocational education" is the functions of local government councils. This in effect means the payment of basic education teachers' salaries and allowances is the responsibility of the local government councils as such but a support for the provisions of infrastructure, facilities, instructional materials, teacher development programs etc.

The differences in budgetary allocations between Nigeria and India signify a difference in commitment to the attainment of Goal 4.1 of the SDGs as renewed and approved by the United Nations General Assembly. This finding therefore agreed with the findings of other scholars (e.g. Kitamura, 2005; Okoroma, 2006; Adeyemi, 2011; Afolayen, 2014 etc.) that basic education in Nigeria is seriously underfunded. Not only basic education, education financing in Nigeria is generally below the international benchmarks of at least 4 – 6% of Gross Domestic Product (GDP) and/or at least 15 – 20% of total public expenditure (UNESCO, *et al*, 2016). While some African countries (e.g. Lesotho, South Africa, Mozambique, Morocco etc.) spend within and above the UNESCO's benchmarks(The Business Insider, 2024), Nigeria spends a low share of its federal budget on education; less information is available on the expenditure of its 36 states that also fund basic education (UNESCO, 2022). Since adequate funding is the bedrock for educational, economic social transformation, Nigeria's transformative efforts are in limbo.

Conclusions

Having failed to achieve the MDGs' Goal 2, target 3 in 2015, this paper proved with empirical evidences that Nigeria' budgetary allocation to basic education from 2016 to 2018 was too low to achieve the MDGs' goal and SDGs' Goal 4.1 compared to India and other countries that were ranked closed to the attainment. India's achievement of MDGs' Goal 2, target 3 can be replicated in the current SDGs' Goal 4.1 by 2030. Upon these evidences, it can be concluded that Nigeria's failure to attain the MDG target in 2015 as it relates to education is largely due to inadequate funding, corruption and other mismanagement issues, a failure on the verge of repeating itself in the SDGs' Goal 4.1 by 2030. The infrastructural decay, inadequatequalified teachers and the ineffectiveness of the few available, inadequate and

irrelevant instructional materials, facilities and equipment, etc. all reveal the inadequate funding and mismanagement in basic education subsector.

Recommendations

In line with the findings of the study and current realities in Nigeria and other countries, this paper recommends that:

1. Nigeria should increase its budgetary allocations to basic education in line with the UNESCO, *et al* recommendation of at least 4 – 6% of Gross Domestic Product (GDP) and/or at least 15 – 20% of total public expenditure. This can be achieved by blocking leakages in other sectors that compete with basic education, freeing adequate funds flow to basic education subsector;
2. Nigeria should restructure basic education subsector, review laws, policies and guidelines thereby removing some bottlenecks and suspicious technicalities in the management and flow of funds within the basic education subsector. For instance, laws should be revised to centralize the management of basic education in the hand of federal government including payment of teachers' salaries, training and retraining or cancel all federal support to basic education thereby allowing states/local governments to take full responsibility of providing basic education.
3. Nigeria should improve states' and local governments' awareness and commitment to basic education financing, broadening other sources of donations by local and international donor agencies, creating possibilities of community participation through proper mobilization.

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Artificial Intelligence in Education: Tools or Threats to Nigerian Education System

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Abstract

Artificial Intelligence (AI) is rapidly transforming education systems across the world. This transformation is now offering new insights and possibilities for teaching, learning, research and school administration. In the Nigerian context, this paper through qualitative and thematic analysis explores the opportunities, benefits and possible threats AI poses to Nigerian education. This attempt is necessary because on one hand, effective integration of AI into Nigerian education could enhance personalized learning, streamline administrative tasks, and may even solve the problems of resource gaps in Nigerian education. On the other hand, AI may pose more significant challenges to Nigerian education like worsening unethical academic practices, worsening the infrastructural limitations, exacerbating the digital divide/educational inequalities in Nigeria. By analysing these realities, the paper posited that AI could be highly beneficial to the Nigerian education if appropriately implemented. The paper also observed that AI generative tools could be destructive to the Nigerian education system if inappropriately utilised. The paper therefore, recommended that the integration of AI into the Nigerian education system should be guided by critical reflection, pragmatic policy reforms, and sustainable investments in digital literacy and infrastructure.

Keywords: *Artificial Intelligence*, AI Tools, AI in Education, AI Threats

Introduction

Today across the world, one of the most emerging and mostly utilised technological resources in education is what is now known as Artificial Intelligence; which is also known by the acronym, (AI). In education, Artificial Intelligence is having a phenomenal impact. Its integration across levels of education is now reshaping how knowledge is sourced, transmitted, and evaluated. From intelligent tutoring systems, automated grading tools to predictive analytics and virtual learning assistants, AI technologies are now dismantling the boundaries of traditional classroom.

AI technologies in education can potentially address major resource problems in Nigerian education because its tools and generative platforms could help enhance educational access, improve quality, and bridge the resource gaps in Nigerian education (Utaka and Utaka, 2024). Through its generative tools, AI technologies in education can offer automated learning experiences to many Nigerians who live far from school or those that live in remote or underfunded communities.

To effectively harness the potential benefits of AI in education, some Nigerian universities have begun adopting AI tools in areas like administrative tasks and grading enhancements. For instance, Covenant University has piloted an AI- assisted grading system for objective assessments in large-enrolment courses such as General Studies (GNS). The aim is to reduce grading time and ensure uniformity and fairness (Ogwo 2025). Similarly, Babcock University has explored the integration of AI Chabot to handle student queries related to registrations and course contents.

Recent statistical data across the federation indicate a massive surge in AI utilisation by Nigerian students, particularly in tertiary institutions because AI generative tools such as ChatGPT, and Germini have become indispensable for academic engagements in the contemporary era (Ogwo 2025). In Edo State, a group of secondary students were randomly selected to attend English language lessons powered by ChatGPT. The researchers

opined that the study yielded four significant results: Generative AI students outperformed non AI students, the study recorded higher performance across subjects and gender, deeper engagement brought greater gains, and that Generative AI gains were remarkable (Vota 2025).

While these developments offer tremendous potentials for improving educational access and outcomes, sceptics fear that the integration of AI innovations into Nigerian education may widen existing educational challenges such as: lopsided funding, infrastructural shortages, ethical challenges, problems of educational access, and equity. For instance, Temitope et al, (2025) argue that in a country where access to internet and ICT remain limited, AI could exacerbate existing gaps in educational resources between urban and rural areas. There is also the growing concern among the academic community in Nigeria that students and scholars now exploit AI tools to commit unethical academic practices. Hence, the questions worth asking are, is AI a timely technological tool that can help address serious challenges facing the Nigeria education system? or does it pose a threat to an already problem laden educational system which may deepen educational inequality, worsen the ethical/moral issues in Nigerian education? This study aims to explore the potential benefits and threats that could be associated with the adoption of AI technologies into Nigerian education. In doing this, the paper aims to provide a clear understanding of the strengths, weaknesses, opportunities, and threats that may arise due to the integration of AI into the Nigerian education system. At the same time too, the study seeks to inform policymakers, educational authorities and AI experts on how best to exploit the emerging benefits and complexities of AI in Nigerian education **Artificial Intelligence in Education.**

Artificial intelligence in education refers to the use of computer systems that can perform tasks typically requiring human intelligence to enhance learning experience, streamline administrative processes and support educators. AI technologies include machine learning, natural language processing and robots, whichcan personalise learning by adapting content and pace to individual student's needs. This personalized approach helps address diverse learning styles and paces, ensuring that each student receives the attention and resources they need to succeed. (Clugston, 2024).

In general, according to Craig (2024) AI systems in education work by ingesting large amounts of labelled training data, analysing that data for correlations and patterns, and using these patterns to make predictions about future states. According to Ding and Choi (2024) utilisation of AI generated platforms in education could yield:

The integration of AI in educational systems is altering the ways in which students learn, teachers educate, and institutions function. By personalizing learning experiences, automating administrative responsibilities, and delivering real-time feedback, AI is revolutionising the educational landscape; bridging gaps, and encouraging a more inclusive and effective learning environment.

To Pathak (2024), AI in education refers to the use of artificial intelligence technologies to enhance the teaching and learning experience. This can involve different software and systems that adapt to individual student's learning paces and styles, provide personalized learning experiences, assist teachers with grading and administrative tasks, and offer insights into students' progress and challenge. To Gill (2024), AI applications are becoming crucial for colleges and universities, whether it is for personalised learning, computerised assessment, smart educational systems, or supporting teaching staff.

Importance of AI in Education

Supporters of AI in education have never seized to emphasise that benefits of AI innovations in education cannot be overemphasised. Sidiqui (2024) asserts that AI holds the following benefits in education:

AI is not just a tool for the future; it is a powerful ally in today's classroom, enhancing learning experiences, supporting teachers, and making education more personalised and inclusive. AI powered tools also help teachers by automating administrative tasks like grading and attendance, giving them more time to focus on student engagement and tailored instruction. Additionally, Ai- driven platforms adapt to each student's learning style and pace, creating customised learning path that ensures no one is left behind. AI also promotes accessibility, providing resources for students with disabilities and those in remote areas, helping to bridge educational gaps.

In a related development Tyagi (2024) agrees that:

AI can assist students with their academics and homework in significant ways. AI is a simulation of human intelligence into a computer so that it can think and work like a human. Remember the old days when we used to spend long hours on homework, learning lessons and other academic activities? Where we took hours to complete one activity, AI can help us to finish it in minutes. Teaching is a skill and no AI can do what a teacher does. However, AI has enhanced our personalized learning experience in real time. AI can help you with every educational work. Artificial intelligence platforms like Google AI, OpenAI, and TensorFlow have made learning effective and more engaging than ever.

Tyagi (2024) further listed the following as areas through which AI plays an important role in education:

1. AI in education personalizes learning experiences for everyone.
1. Popular learning platforms use AI to adjust educational content for students.
2. Students can take the help of AI to explore project ideas.

3.Students can ask AI to solve tough math problems.

4. Students can check online performances and results using AI's data analysis.
5. AI platforms offer accessibility to everyone, regardless of any discrimination.
6. AI assist educational professionals with their learning and teaching skills.
7. AI has introduced new ways of learning, like virtual reality and augmented learning.
8. AI is considered the future of learning, as it offers information about the past and present and can predict the future.
9. AI algorithms allow students to connect with like-minded people.

From the discussions above, this paper views that integrating AI generative tools and platforms into Nigerian education system is a twenty-first century educational necessity and is compatible with many policy statements on education in Nigeria. Specifically, some of the areas where AI innovations could be of utmost beneficial to Nigerian education are:

1. Personalised Learning: Adaptive technologies offer individualised pathways for students, enabling them to work at their own pace and reducing dropout rates (Hakimi &Fasil, 2024).

2. Teacher Support: Automated grading and intelligent analysis can lower teachers' administrative loads, freeing time for more instruction (Opesemowo & Adekomaya, 2024).

3. Data-Driven Policymaking: AI-enabled analytics can provide real-time insights into academic performance (Ali & Okon, 2024).
4. AI can address Nigeria's teacher shortages by automating administrative tasks and offering virtual tutoring.
5. Through language translation tools, AI has the potential to enhance learning in many local Nigerian languages like Igbo, Hausa, Yoruba, Efik and Igala.

Indeed, one can say without any sense of doubt that AI generative tools and innovations hold a lot of potentials for Nigerian education. But on the flip side, many Nigerian are concerned that integrating

AI into Nigerian education has come with its own challenges. Some of these challenges as outlined by Ukala and Ukala (2025) are:

1. Infrastructure: Persistent outage and poor internet coverage hinder consistent AI usage. This problem is more in areas far from the main towns.
2. Equity concerns: AI technologies may widen educational inequalities in Nigeria if its implementation if focused on well-funded schools.
3. Ethical challenges: such as plagiarism and academic fraud
4. Cultural Resistant: distrust of technology in some communities may impede widespread acceptance.

AI in Education: Tool or Threat

There is no denying the fact that the adoption of AI innovations in Nigerian education has come to stay and will continue to impact on knowledge transmission and delivery in Nigeria. Despite the potentials of AI, there is the growing concern that the purported potentials of AI in raising the standard of educational delivery and scholarly research in Nigeria is not as rosy as the narratives may appear because the way and manner AI tools could be exploited by Nigerian students and academics could hamper on genuine acquisition of knowledge in Nigeria; and this may degenerate to a situation where AI becomes a threat, rather than a tool for genuine educational acquisition and delivery in Nigeria. Brembeck (1963) had warned that, "there is no magic in education, except as we give it magic. Education can heal or kill, build up or tear apart, lift or deprive. It is an instrument that can be used for good or for bad. We must learn to use it well.". Thus, this logically implies that the success of any resource in Nigerian education in particular and elsewhere in general is contingent upon how it was adopted, implemented and utilized.

Technical Barriers to AI Adoption in Nigerian Education

Adepoju (2025) have pointed out that the implementation of AI generative tools in Nigerian education is faced with some technical challenges such as insufficient infrastructure, unstable internet connectivity, restricted availability of high-performance computer resources, and insufficient data storage facilities. To Nwakanma et al, (2022), lack of proficient experts with specialised knowledge in AI and its associated sectors militate against the effective implementation of AI technologies in Nigerian education.

In his own contribution, Osinubi (2025) observes that a major obstacle to AI adoption in Nigeria is the shortage of skilled professionals who can conveniently handle AI technical complexities because developing AI systems requires expertise in areas such as machine learning algorithms, data engineering, and model optimisation – skills that are in short supply locally. In another perspective, Onwugbuzie (2025) fears that AI's ability to automate teaching, grading, and administrative tasks raises concerns about job losses in the education sector, reduction of face to face aspect of teaching and learning. He also warned that over-reliance of AI may lead to teacher redundancy which may reduce staff employment opportunities. thus, the

effective integration of AI generative tools into Nigerian education system requires considerable investment in ICT and AI resources**.**

Cognitive Risks of AI in Nigerian Education

Despite its potentials, AI integration in Nigerian education raises critical concerns about its alignment with cognitive learning objectives. Experts have warned that over- reliance on AI by students to execute academic tasks can diminish students' cognitive abilities such as problem-solving skills, analytical skills and intellectual thinking skills. For instance, Ali & Okon (2024) observe that students use of AI generative tools such as ChatGPT, Large Language Models (LLMs), GPT4.0, Google AI, OpenAI, and TensorFlow to carryout learning assignments may significantly reduce student's ability to think independently, acquire problem-solving skills and evaluate ideas. Also, studies indicate that the misuse of AI- powered tools by students and academics in Nigeria for generating essays, solving assignments, and completing research papers without attribution has become wide spread (Osang, et al 2025). Similarly, Dergaa et al (2024) also warns that increased dependency on AI systems could potentially contribute to feelings of inadequacy, reduced self-confidence, and/or a sense of helplessness because as individuals become accustomed to using AI systems for various tasks, they may neglect the development and maintenance of their own cognitive skills.

These unfortunate circumstances contradict the worthwhile and value-laden nature of education. Its prevalence raises the fear is that Nigerian students and academics who indulge in such dishonest practices may not acquire genuine and in-depth knowledge. Therefore, serious caution should be taken when AI technologies are integrated into the Nigerian education system.

Social Risks of AI in Nigerian Education

Similar to the cognitive concerns raised above, AI adoption in Nigerian education system could generate critical social problems. On a general note, Dergaa et al (2024) pointed out that excessive reliance on AI by people and students could significantly decrease human-to-human interaction, increased social isolation, and/or potential loss of empathy or interpersonal skills. Bloke (2023) argues that, "in schools, children actively interact and learn together those things that are necessary for them to fit into the social life of their society; artificial intelligence in education may defeat this crucial aspect and function of the school". To Holmes and Tuomi (2022), a key challenge in ensuring effective integration of AI in education is how to avoid eroding the natural human aspect of learning environment. They observed that, AI automated tasks lack empathy, creativity and the nuanced understanding of human educators. In an empirical study, Obinna et al (2023) found that the teachers who emotionally connect, motivate and empathise with students enhance students' academic growth and development. To them, AI tools do not connect to students' emotional environments the way teachers do. To address these challenges, the application of AI tools into Nigerian education should be done in such a way that it does not erode the human aspect of education.

There is also the social concern that while AI may be perceived as neutral entities, they however, rely heavily on data they are trained on. Such data may reflect prejudice against certain races, cultures or affiliations. For example, an AI tool may be designed to assess students' essays on culture or related topics; but if the AI tool is trained on literature from Western cultures, it might inadvertently undervalue or misinterpret contents rooted in Nigerian local contexts – contexts that reflect our culture, identity and shared history. This is why Ajayi & Ogunleye (2021) argue that AI in

Nigerian schools could reinforce existing biases such as gender, racial, or socio- economic disparities. And, such biases, even if unintentional, can perpetuate stereotypes and reinforce societal prejudices, especially if not checked (Halat & Rahme 2024). Thus, AI systems that are compatible with our local contents should be developed.

AI and Ethical Issues in Nigerian Education

No doubt, the implementation of AI generative tools into the Nigerian education has given rise to new forms of academic dishonesty. And because of this, the credulity, authenticity and integrity of many scholarly works in Nigeria are in doubt. Ikeji (2024) discusses that the rise of AI in education has made academic integrity more challenging. He asserts, "AI has made lazy students lazier and dishonest scholars more dishonest. Oyedokun (2025) agrees that the employment of digital technologies such as AI tools by students and academics to generate essays, solve mathematical problems, or manipulate academic assessments has introduced new forms of academic misconduct that are more difficult to detect and prevent. In support of this assertion, Qadiri (2023) have earlier highlighted that students now misuse AI generative platforms to exhibit academic dishonesty and other unethical practices to complete assignments without attribution. Educators in Nigeria are also worried that students are tempted to outsource their work to ChatGPT since it generates acceptable material quickly, making it difficult to detect instances of plagiarism (Izevbigie et al 2025). More worrisome is the concern that, apart from introducing new forms of academic dishonesty, AI manipulations can also outsmart or impede efforts made towards detecting unethical academic practices. To combat this challenge, AI generative tools employed in Nigerian educational system should be utilised in such a way that it enhances learning rather than compromising academic integrity. In view of this, UNESCO recommends institutions to always audit AI algorithms and data sources to maintain ethical standards. The organisation also advised institutions to always assess AI's long-term effects on student's sills like critical thinking and creativity, alongside aligning policies with global standards (Complete AI Training, 2025).

AI and the Problem of Digital Divide in Nigerian Education

Equally important is the concern that the implementation of AI technologies into Nigerian education is the fear that indigent students and communities may lack the resources to meet up with the cost of AI and this may further worsen the problem of educational inequalities in Nigeria. For instance, Ibe and Siyanbola (2022) aver that integrating AI generative tools into Nigeria higher education could worsen cases of educational inequalities because access to AI technologies is often prioritised in the urban areas which leaves students in distant areas neglected. Thus, the utilization of AI advances in education especially in developing countries like Nigeria may lead to what is now known as digital divide.

In view of the above, Obinna & Oyise (2023) in a study found the following as part of the digital challenges AI is posing to Nigerian education:

1. Areas with no access to AI: this divide affects individuals, groups, and regions with socio-economic or infrastructural limitations. To them, this divide reinforces educational inequalities in Nigeria.
2. Access to AI, but no understanding of AI: this is caused by low digital literacy and lack of appropriate training, this leads to underutilization of AI technologies in Nigerian education.
3. Access and understanding of AI, but insufficient use of AI. Here, people and organisations have access to and knowledge of AI, but are unable to make intelligent and effective use of it.

Conclusion

In conclusion, Artificial Intelligence generative tools hold immense transformative potentials to Nigerian education. From helping to address problems of resource gaps in Nigerian education, AI can also promote individualised learning experiences through various forms of automated tutoring. AI tools can also be employed to execute different forms of school administrative tasks. However, despite these potentials, the paper warns that AI into Nigerian education has its accompanying consequences which may inadvertently make AI to become a double edged sword in Nigerian education system. If AI is utilised without critical reflection or is adopted unethically, it could pose serious threats to cognitive development of Nigerian students, can promote academic misconduct, can exacerbate educational inequalities in Nigeria, and can worsen the problem

Recommendtions

1. The government and stakeholders in education should urgently close the digital, infrastructural, technological and personnel gaps in Nigerian education. Underfunded schools and communities should be prioritised.
2. Relevant agencies and institutions should train AI experts who can develop AI contents that are relevant to Nigeria's contextual educational challenges and realities.
3. Educational authorities and relevant agencies should develop and enforce strict academic integrity guidelines.
4. Technological and AI tools that can effectively combat or detect AI-related academic misconduct including other forms of unethical academic practices in Nigeria should be developed and utilised.
5. Relevant authorities should periodically carryout awareness programmes in order to promote AI literacy especially among teachers, researchers and students. Such programmes should include acquisition of up to date AI technical skills.
6. Effective use of AI innovations in education should be integrated into the syllabus of General Studies in Nigerian schools, colleges and universities.
7. Scholars and institutions should periodically carryout empirical studies on how AI tools may continue impact on different aspects Nigerian schools.

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Assessing the Challenges of Computer Assisted Learning for English Language Teaching in Nigeria

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Abstract

Information communication technology has created many and interacting ways for students to engage in literacy activities for authentic purposes. Computer assisted learning (CAL) devices improve students' self-esteem, giving them independence and control, and making learning enjoyable. One of the basic function of education is preparing students for life development; this function in 21st century where knowledge is regarded as the main source for socio-cultural and political-economical development. The paper provides discussion on technology resources for teaching English Language in Nigeria; problems associated with teaching English Language; integrating CAL in teaching-learning English Language, some benefits of CAL; implication for classroom practice; and some suggestions were discussed.

***Keywords*:** Assessing, Challenges, Computer Assisted Learning.

Introduction

Information technologies affect the teaching learning process in different ways which help the teachers in preparing lecture notes for interesting presentation on one hand and the students on the other hand. Information technologies provide opportunities of global interactions; students can learn from interactions with co-learners using global networks. They can interact at their own and get rid of their routine work. They may review and explore the qualitative as well as quantitative data through computer networks. They can work on group projects participating in peer knowledge building activities. Under the influence of information technologies, teaching and learning occurs in a changed situation, there seems a shift from teacher centred teaching to student centred learning. Computers and their associated software provide opportunities for improving the quality of educational programmes and enhancing students' participation. The appropriate use of CBL and CAL can exert positive influences on student' enthusiasm, motivation and confidence.

landscape, offering a plethora of innovative tools and resources to enhance language instruction and learning (Hussain & Safdar, 2008; Westwood, 2007). The main benefit of computer-assisted learning (CAL) is that the technology makes use of well-established principles of instruction such as clear demonstrations and modelling in easy steps, active participation and practice to mastery level. Students are active throughout the learning session and they have high levels of motivation. At the most basic level of CAL, computer programs exist that will help students improve their letter recognition, alphabet knowledge, word recognition, decoding, sentence completion, cloze and spelling skills. Spelling and word study may be presented by age-appropriate programmes. Children with reading difficulties can gain much from using text-to- speech (TTS) software, with its combined visual and auditory presentation. At higher levels, programs may focus more on comprehension, application and 'reading to learn' than 'learning to read'.

It had been pointed out that students with reading problems are often limited in their ability to use ICT to search information for classroom projects. Close monitoring by the teacher and judicious use of peer tutoring can help reduce the problem and help the student acquire computer skills. In the home situation, the computer can also aid literacy development because children can work alone or with a parent on early reading and writing skills.

English instruction has shifted from a foreign to an international language, driven by its rapid growth and global use. English is seen as a universal language providing opportunities for employment, travel, education, and a better quality of life (Crystal, 2003; Saud, 2020a; Saud, 2020b). English language teachers face challenges in using English as a medium of instruction, including limited student exposure, native language interference, and low proficiency, lack of support, demotivating environment, and resource constraints (Ranjit, 2022; Khatri, 2019; Bista, 2011). A variety of methods have been adopted for teaching English to young students in challenging situations, such as incorporating parents and the community in the learning process, using songs and games to engage students, and employing visual aids to overcome linguistic hurdles (Kuchah, 2018). Curtis (2021) observes that under-resourceful contexts can be found in many parts of the world (Nigeria inclusive) and can take various forms, such as schools with lack of books or basic classroom materials, institutions without access to modern technology and large class sizes that prevent students from receiving individualized attention.

With the rapid advancement of technology, its integration into education has expanded. Common technological devices include radio, mobile phones, television, computers, tablets/e- readers and multimedia projectors (Barksdale et al., 2021). These technological devices provide numerous benefits, including increased access to education, rapid information, improved communication, interactive learning, and cost-effective to instructional materials. Otaiba and Pappamihiel (2005) classify the stages of English-language development as, the silent stage, the early production stage, the productive language stage and the intermediate fluency language stage.

Teaching English Language in Nigeria comes with its unique set of challenges. One major issue is multilingual nature of the country with diversified dialects. Inadequate teacher training in teaching English Language; the decline in reading culture among most people particularly the students, these students prefer digital media (watching videos, attending to activities of social media) than reading books. There is also problem of linguistic influences – meaning that the diverse existing languages may influence the attitude of students toward correct usage of English Language (both reading and writing). There are issues affecting curriculum structure or effective implementation of the curriculum. Also, problem of availability of resources including textbooks, technologies and libraries. Teachers are poorly motivated which directly affect teaching-learning process; factors such as poor renumeration, lack of professional development opportunities and poor working conditions.

The thesis statement of this discussion shall include computer-assisted learning (CAL), benefits of CAL, challenges of CAL for English language teaching and implication for classroom practice of CAL in English language teaching.

Computer-assisted learning (CAL) for English Language teaching

CAL is an alternative teaching resource aimed to provide engaging, interactive, and diverse learning experiences to facilitate effective English language learning (Adhikar, 2019). These devices are utilized to implement audio-visual exercises and create charts and posters, serving as alternative tools in schools (Ghimire, 2019b).

Alternative teaching methods and materials in teaching English refer to non-traditional approaches and resources used to enhance language learning, such as utilizing personal devices such as mobile phones, creating visual aids, charts and posters, and promoting group work and collaborative learning in the absence of textbooks. These alternative approaches aim to provide engaging, interactive, and diverse learning experiences to facilitate effective English languge learning (Adhikari, 2019). Student-centred learning aims to individualised the learning the learning experience by incorporating students' prior experiences, fostering active engagement, cultivating higher-level thinking and supporting lifelong learning. This approach, which encourages students to organise, analyse, and synthesise content through collaboration and access to resources, aligns with the educational objective of developing critical, competent individuals and future professionals (Bisural, 2022a).

Interactive and communicative language activities, such as pair work, group work, and language games, encourage learners to actively participate and engage with English language (Copland, 2014). There have been lots of problems and challenges around the globe (Nigeria inlusive) regarding teaching English (Bhattarai, 2017). Various studies have recognized under-resourced context as insufficient space and overcrowding in classrooms, insufficient time spent in school and in class, poorly-designed teaching and learning materials, a lack of access to newer technologies such as computers, and lack of initial teacher training and/or ongoing professional development for teachers (Coleman, 2018; Zulu, 2016; Farbman, 2015; Chirwa & Naidoo, 2016; Huang & Hong, 2016; Bietenback et al., 2018).

The following some examples of CAL in English language teaching:

1. Language Learning Platforms: - Duolingo, Babbel, Rosetta Stone.
2. Online Resources: - BBC Learning English, English Central (video- based language learning), Quizlet (vocabulary building and flashcards).
3. Interactive Whiteboards: - SMART Boards, Promethean, Google Jamboard
4. Multimedia Materials: - Audio and video recordings, Podcasts.
5. Language Exchange and Practice Tools: - HelloTalk (language exchange app), Conversation Exchange (language exchange website), Speechling (speaking practice with feedback)
6. Grammar and Vocabulary Building Tools:
   - Grammarly (writing tool with grammar and vocabulary feedback), Quizlet (vocabulary building and flashcards), Lingodeer (interactive grammar and vocabulary exercises).

7. Virtual Learning Environments (VLEs): - Moodle, Blackboard, Canvas.

The following some examples of CAL in English language teaching:

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14. Virtual Learning Environments (VLEs): - Moodle, Blackboard, Canvas.

Benefits of Computer-assisted learning (CAL)

Computer-assisted learning (CAL) offers numerous benefits for English Language Teaching such as: Personalised learning: CAL allows for tailored instruction and adaptive learning, catering to individual students' needs and abilities.

1. Increased engagement: Interactive multimedia materials and games enhance student motivation and participation.
2. Improved accuracy and feedback: CAL provides immediate feedback and correction, helping students identify and rectify errors.
3. Enhanced listening and speaking skills: Audio and video materials, as well as speech recognition technology, improve pronunciation and comprehension.
4. Access to authentic materials: CAL offers exposure to real-world language use, news, and cultural contexts.
5. Flexibility and autonomy: Students can learn at their own pace, anytime, and anywhere.
6. Efficient use of resources: CAL reduces the need for physical materials and can reach a larger audience.
7. Data analysis and tracking: CAL provides insights into student progress, helping teachers identify areas for improvement.
8. Collaboration and communication: CAL facilitates online discussions, peer review, and language exchange. Cost-effective: CAL can reduce costs associated with traditional teaching methods and materials.
9. Accessibility: CAL reaches students with disabilities, remote or rural areas, and those with conflicting schedules.
10. Teacher support: CAL provides resources and tools for teachers, reducing preparation time and workload.
11. Scalability: CAL can accommodate large numbers of students, making it ideal for large classes or institutions.

12. Updated content: CAL materials can be easily updated, ensuring students access current and relevant language learning resources.
13. Develops digital literacy: CAL helps students develop essential digital skills for the modern world.

Integrating Computer Assisted Learning (CAL) in Teaching English Language in Nigeria

1. Formulation of clear and specific learning objectives and outcomes: It is essential to state clearly learning objectives and outcomes to align with computer assisted learning activities.
2. Provide teacher guidance and support for the students to ensure proper and effective utilization of computer assisted learning resources Ensure blended learning approach in which conventional teaching methods are combined with computer assisted learning in order to create adequate blended learning space for the student.
3. It is essential to regularly evaluate the activities involved in utilising computer assisted learning in teaching English Language, as well as providing feedback of students progress and effectiveness or otherwise of computer assisted learning.
4. Technical support should be available and ensured to troubleshoot problems/issues that may arise during the lessons.

Challenges of Computer-assisted learning (CAL)

While Computer-Assisted Learning (CAL) offers numerous benefits for English Language Teaching, some of the challenges to consider include:

Technical Issues: technical issues can affect the effective utilisation of computer assisted learning in teaching English Language; some of which include: internet connectivity problems; outdated hardware that is no longer supported CAL software; software glitches causing disruptions; incompatibility between hardware and CAL software; power outage and electrical issues that may disrupt CAL activities.

Teacher training: Educators may need training to effectively integrate CAL into their teaching practices and navigate digital tools.

1. Equity and access: Not all students have equal access to technology, devices, or internet connectivity, creating a digital divide.
2. Quality of resources: The quality of CAL materials and resources can vary greatly, and educators need to carefully evaluate their effectiveness.
3. Overreliance on technology: CAL should supplement, not replace, human interaction and teaching.
4. Student motivation and engagement: CAL can be isolating if not implemented thoughtfully, leading to decreased student motivation and engagement.
5. Assessment and feedback: CAL can make it challenging to provide timely and effective feedback and assessment.
6. Curriculum integration: CAL may not always align with curriculum requirements and standards.
7. Cost and funding: Implementing and maintaining CAL can be costly, and funding may be limited.
8. Digital literacy: Students may need guidance on how to effectively use technology for language learning. Language and cultural barriers: CAL materials may not be suitable for diverse student populations, and cultural sensitivity is crucial.
9. Monitoring and evaluation: It can be difficult to monitor student progress and evaluate the effectiveness of CAL.

10. Technical support: Technical issues can arise, and timely support may not always be available.
11. Student autonomy: CAL can make students too autonomous, leading to a lack of interaction with teachers and peers.
12. Ethical considerations: CAL raises ethical concerns, such as privacy, data security, and intellectual property rights.

Implications of Computer-assisted learning (CAL)

Here are some implications for classroom practice of Computer-Assisted Learning (CAL) for English Language Teaching:

1. Teacher Roles

Facilitator: Guide students in using CAL resources Mentor: Provide support and feedback Manager: Monitor student progress and technical issues

2. Classroom Environment Flexible seating and layout Technology integration (e.g., interactive whiteboards, laptops, tablets) Access to online resources and tools

Lesson Planning

Incorporate CAL activities and resources Align with learning objectives and outcomes Consider technical requirements and support

2. Teaching Strategies Blended learning approaches Student-centered and autonomous learning Collaborative and peer-to-peer learning Formative assessment and feedback

3. Assessment and Evaluation

Use CAL tools for assessment and feedback Monitor student progres and learning outcomes Evaluate effectiveness of CAL resources and activities

4. Student Learning

Develop digital literacy and technical skills Enhance language skills and knowledge Encourage autonomous and self- directed learning Foster collaboration and communication skills

5. Challenges and Solutions

Technical issues: Have a backup plan and technical support

Equity and access: Ensure equal access to technology and resources

Teacher training: Provide ongoing professional development

Suggestion

The teacher adopts a communicative approach, prioritizing student engagement through conversations, dialogues, and group work. The focus is on developing listening, speaking, reading, and writing skills; employing a variety of teaching methods/ strategies allows teachers

Conclusion

Computers and their associated software provide opportunities for improving the quality of educational programmes and enhancing students' participation. to better understand the individual needs and interests of their students (Bhatt, 2023). Furthermore, integrating task-based learning, where language is used purposefully in real-life projects, enhances practical language skill development, enriching the overall educational journey (Bisural, 2022b).

The appropriate use of CAL can exert positive influence on students' enthusiasm, motivation and concentration prioritising students engagement through conversation, dialogues and group work. Integrating task- based learning, where language is used purposefully in real-life projects enhances practical language skill development.

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Leveraging Innovative Technology and Pedagogical Strategies to Enhance Special Needs Education: Best Practices for Sustainable Development in Nigeria

By

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Abstract

This paper explores the intersection of innovative technology and pedagogical strategies in enhancing special needs education in Nigeria. As the country strives for inclusive education, the integration of technology offers unique opportunities to address the diverse challenged faced by students with disabilities. This paper highlights best practices in using assistive technologies, digital learning tools, and tailored instructional methods that cater to individual learning needs. Moreover, the paper emphasizes the importance of sustainable development practices, ensuring that educational innovations are not only effective but also environmentally and socially responsible. By fostering collaboration among educators, technologists, and policymakers, we aim to create a roadmap for implementing these strategies on broader scale. Ultimately, this paper seeks to empower stakeholders to leverage innovative solutions that promote equitable access to education, enhance learning experiences, and contribute to the overall development of special needs education in Nigeria. Through share knowledge and experience, we can drive meaningful change and create a more inclusive education landscape.

Introduction

The potential of leveraging innovative technology and teaching methodology strategies can contribute to overcoming the barriers and fostering special needs education environment in Nigeria. By embracing a multidimensional approach and leveraging innovative technology, Nigeria can make significant special needs education. The strategies encompasse multiple dimensions that are essential for creating equitable and special needs learning environment for learners. There should be an educational transformation that will address the challenges and gaps in creating truly learning environment for different learning disabilities in Nigeria context.

Concept of Special Needs Education

Special needs education means education of the exceptional child. It is the system of education that uses special tools to address the special learning needs of the exceptional child (Ozoji, 2008), explains that it is an individual education that aims at compensating for the special learning problems of the exceptional child (i.e a child with special learning needs). It is a service-oriented system of education focusing majority on the content and processes of educational intervention for persons with special learning needs. In fact, this system of education is currently and constantly expanding its 'modus operandi' in instructional and material provisions for educating persons with special needs in order to achieve universal education for all school- aged children not withstanding their physical or mental capacity. Invariably, the specialness of special needs education is in its philosophical orientations, professional practices and customized organizational contents to suit its special clients' need through innovative technology and pedagogical strategies (Ozoji, 2006).

Special needs education in Nigeria caters to individuals with disabilities, impairments, or exceptional abilities .The Nigerian government and organizations provide support through policies such as: National Policy on Education (2013), Persons with Disabilities Prohibition Act (2018), National Commission for Person with Disabilities

NCPWD Act (2018) programmes, and institutions such as: Federal Government Colleges for visually impaired and hearing impaired, State- owned special schools, private special schools, NGOs and community-based organizations.

Innovative Technologies for Special Needs Education in Nigeria.

A lot of scientific discoveries have contributed in the prospects of children with special needs education. In Nigeria context, such practical scientific discoveries (Innovative Technologies) which are being used for sustainable development for special needs education are:

1. **Assistive Technology (AT) devices and software**: AT is used as an umbrella term for both assistive product and related services. The International Classification of Functioning, Disability and Health (ICF) define assistive technology and products as any product, instrument, equipment or technology adapted or specifically designed for improving the functioning of a person with a disability (World Health Organization, 2014). Drawing from the ICF, the International Organization for Standardization (ISO) define assistive technology and product are more broadly as any product, especially produced or generally available, that is used by or for persons with disability: for participation; to protect, support, train, measure or substitute for body functions/structures and activities or to prevent impairments, activity limitations, or participation restrictions. This includes devices, equipment, instruments and software (International Organization for Standardization, 2011). The devices and software for categories of people with special needs are:

2. **Mobility for Pupils with Physical Impairment**: The devices and software include; walking stick, crutch, walking frame, manual and powered wheelchair, tricycle. Artificial leg or hand splint, clubfoot brace corner chair, supportive seat, standing frame, adapted cutlery, dressing stick, shower seat, toilet seat etc.

3. **Pupils with visually impairment**: The devices and software includes: eyeglasses, magnifier, magnifying software for computer, white cane, GPS-based navigation device, Braille systems for reading and writing, screen reader for computer, talking book player, audio recorder and player, Braille chess, emit sound balls.

4. **Pupils with hearing impairment**: The devices and software includes: headphone, hearing aid, amplified telephone, hearing loop.

5. **Communication Disorders**: These includes: communication cards with text, communication board with letters, symbols or pictures, electronic communication devices with recorded or synthetic speech.

6. **Cognitive Disorders**: These includes: task list, picture schedule and calendar, picture based instructions, timer, manual or automatic reminder, smartphone with adapted task lists, schedules, calendar and audio recorder, adapted toys and games.

By facilitating the participation and inclusion of children with special needs education in Nigerian in all aspects of life, assistive technology can impact on self- image, self-esteem and sense of self-worth (Scherer MJ & Glueckaut R, 2005)). Given opportunities to flourish as others might, children with special needs have the potential to lead fulfilling lives and to contribute to the social, cultural, and economic vitality of their communities (UNICEF, 2013).

Assistive Technology reduces costs when it supports early childhood development and educational achievement, and avoids repetition of learning missed due to educational barriers. It reduces costs by supng academic activities as their peers without disabilities (Samant D. et al., 2013).

7. **Artificial Intelligence (AI) powered learning platform:** Artificial Intelligence (AI) can be defined as a system of computers and machines working collaboratively to emulate logical human cognition (Tai, 2020). These AI applications are especially salient for individuals with special needs , many of whom use assistive technology features (e.g., speech-to- text) within their smart phones andother technology enhanced devices to engage with their environment (Fernandez-Batanero et al.,2022) most of us utilize AI daily, whether we know it or not. Shopping, social media, , ride sharing, travel, and searching the internet, are each influenced by AI.

   Artificial Intelligence has been used in a variety of educational applications (Stokel- Walker & Van Noorden, 2023). Artificial Intelligence based tutoring systems have been developed to provide personalized instruction to students.

   Generative AI has the potential to revolutionize the way students with special needs learn. AI-based tutoring systems can provide personalized instruction (e.g., https//tutorly.ai) for students with special needs, allowing them to learn at their own pace. AI-based assessment systems also can provide supports for teachers (e.g., https://educationcopilot,com), helping them to identify areas of improvement and adjust instruction accordingly. AI-based assistive technology also can be used to provide support to students with special needs , such as text-to-speech software and voice recognition system.

   Artificial Intelligence is increasingly considered as an option in education due to its potential positive impact on learning outcomes and everyday life. AI-enabled software applications can recognize patterns, analyze data, and identify trends faster than humans. For example, Alexa or Siri leverage AI to generate responses to verbal data received from users. The future of generative AI will allow special education teachers to quickly adjust educational practices and allow IEP teams to make data-informed decisions with greater speed and accuracy than ever before (Herman, 2022).

   The application of AI during writing instruction can enhance both output and outcomes during the writing process. For years, writing instruction focused on planning, drafting, editing, and publishing (Evmanova & Regan, 2019). Artificial intelligence can be used to support students with special needs in a variety of ways (Barua et al., 2022). For example, AI- enabled chatbots can respond to simple student queries, freeing up teachers and educational assistants to focus on increasingly complex students' needs. AI enable computer vision systems can detect a variety of physical behaviours, including emotional expressions and gestures, which can be beneficial for students with autism or emotional impairments (Asthana & Gupta, 2019). Furthermore, AI-enable artificial instructors can deliver personalized learning experiences tailored to the needs of the individual learners by providing adaptive experiences tailored toindividual needs (Chen et al., 2020; Devi et al., 2022).

8. **Mobile apps for learning and communication**: smaili and Ibrahim (2017) explain the potential of mobile learning as an alternative to traditional assistive technology devices for special needs students. Mobile apps is adaptable and accessible device that can serve as effective tools to accommodate diverse learning needs. The impact of mobile learning on the educational experiences of students with special needs, provide insight into the advantages and challenges associated with learning.

   Google play reviews contain important information about the apps, what they do and how they could be improved; hence, they are informative for both the developer and the user as well (Ha and Wagner,

2013). Integrating mobile applications into special education can enhance assessment methods by providing more interactive, personalized, and accessible tools. Here are several assessment methods in special education that can be facilitated through mobile applications:

- **Formative Assessment Apps:** it offers ongoing assessment opportunities during learning activities. It provides instant feedback, adapt to individual learning styles, and allow educator to monitor progress in real time.

Digital Portfolios: Apps that enable the creation of digital portfolios showcasing students' work examples, projects, and achievements. It facilitates a comprehensive view of a student's progress and development over time, promoting a strengths-based approach.

- **Interactive Educational Games:** mobile games designed to assess academic skills in a playful and engaging manner. It assesses skills in a non-traditional format, offering insights into problem-solving, critical thinking, and content knowledge.
- **Augmented Reality (AR) for Functional Behaviour Assessment:** AR apps that stimulate real-world scenarios for assessing and analyzing behavior patterns. It enhances the observation and analysis of behaviours in realistic settings, contributing to a more accurate functional behavior assessment.
- **Communication Apps for Augmentative Communication Assessments:** This apps facilitate alternative and augmentative communication (AAC) assessment. It supports the evaluationof communication needs and determines suitable AAC strategize or device, or fostering effective communication.
- **Digital Speech and Language Assessments:** This apps designed to assess speech and language development.

It provides interactive assessments of language skills, articulation, and communication, allowing for individualized intervention plans.

- **Adaptive Learning Apps:** It personalized learning apps that adapt contents based on a students' performance. It accesses academic skills and adopts content to meet individual learning needs, offering a tailored educational experience.
- **Sensor-Based Assessments:** Apps that utilized device sensor for assessing physical or motor skills. It offers quantitative data on motor skills, coordination, and physical abilities, aiding in the assessment of adaptive and gross motor skills.
- **Social Skills Training Apps:** Apps designed for assessing and enhancing social skills. It allows for interactive assessments of social interactions, emotional understanding, and perspective-taking.
- **Digital Transition Planning Tools:** Apps that support transition assessments and planning for post-school life. It facilitates the exploration of career interests, strengths, and guiding the development of transition goals.

9. **Online platforms for remote learning and support:** technology has the potential to revolutionize learning by introducing new modes of online learning. While this transformation is seen as promising to some and threatening to others,
10. the COVID-19 pandemic demonstrated the viability of online learning as a solution for education continue for special needs persons. With global reach of the internet, a new era of learning from anywhere and at any time has emerged. The outbreak of the pandemic accelerated the trend towards online education (Gin et al., 2022; Kourea et al., 2021). This suggests that distance learning offers advantages and better affordances to certain groups, depending on the nature of the disability (Meda & Waghid, 2022). Students With Disabilities (SWD) value flexibility and the ability to rewatch recorded lectures at their convenience, as well as diverse instructional modes through

online platform. Remote learning reduce the pressures for immediate responses in live discussions,promoting self- determination (Mullins & Mitchell, 2021).

Online classrooms can serve as equalizers for SWD, offering opportunities for interaction without disclosing the disabilities (Thompson & Copeland, 2020). The elimination of travel reduces stress and enhances equity in assessments. SWD appreciate the flexibility in timing and format, enabling them to take, lessons/ lectures, and examinations from home, resulting in a more inclusive experience (Tai et al., 2022).

Pedagogical Strategies for Special Needs Education

Pedagogical strategies refer to the profession of teaching in relation to methods, principles, and practices that promote effective learning. It caters for diverse learning needs, promoting inclusive and supportive learning environment. The leveraging pedagogical strategies that have demonstrated effectiveness in promoting special needs education are discussed as follows:

1. **Universal Design for Learning (UDL**): Universal Design for Learning (UDL) is an innovative pedagogical framework that guides educators in designing instruction that is accessible and beneficial to all learners. UDL emphasizes the provision of multiple means of representation, expression, and engagement, catering to the diverse learning styles, abilities, and background of students (Rose & Meyer, 2002). By leveraging flexible instructional strategies, multimedia materials, and assistive technologies, UDL promote active engagement and participation of all students in the learning process.

2. **Differentiated Instruction**: differentiated instruction is a strategy that recognize and addresses the diverse learning needs of students within a single classroom. It involved tailoring instructional method, content, and assessment to meet the varied abilities, interest, and readiness level of students (Tomlinson, 1999). By offering multiple pathways for learning, such as through varied instructional materials, learning tasks, and instructional strategies, differentiated instruction supports the individualized learning experiences of all students, fostering their academic growth and success.

3. **Collaborative Learning**: collaborative learning emphasizes peer interaction and cooperative group works as a means of enhancing learning outcomes for all students. It encourages students to actively engage in shared learning experience, promoting social interaction, critical thinking, and problem-solving skills (Johnson & Johnson, 1999). In inclusive classroom, collaborative learning provides opportunities for students with diverse abilities to work together, leveraging each other's strengths and supporting one another in achieving common learning goals.

4. **Project-Based Learning (PBL):** This is a strategy that involves students in the investigation and resolution of authentic, real-world problems or challenges. PBL encourages active learning, critical thinking, and application of knowledge and skills in meaningful context (Thomas, 2000). Inclusive classroom can benefit from PBL as it promotes students' engagement, creativity, and the development of problem-solving abilities, allowing students with divers needs to contribute their unique perspectives and talent to the learning process.

5. **Personalized Learning Plans:** A personalized learning plans are used to provide information and strategies relating to adjustment for students with disabilities or learning support requirements. PLP is a guide to help students meet their goals. It is important that they are engaged from start to completion and take primary responsibility of seeing that the goals are being achieved. Once

students have developed their personalized learning plan, the real work begins. It is now time for students to begin working on their plans and achieving their goals. Students should review their plans regularly and utilized the human resources they have identified as important to their success.

Best Practices for Sustainable Development in Nigeria

To sustain innovative technology and pedagogical strategies in Nigeria, the following practices has to be put into consideration.

1. **Capacity building for teachers and educators**: A teacher is a trained individual who can actualize the potentiality for knowledge already in the learner and can accurately assess or evaluate the level of achievements of the learner without any biasness. Teacher can translate knowledge, skills, attitudes and values with certain professional principles (Gimba, 2010). Therefore, there should be a conscious attempt at upgrading, renovating and acquiring skills, abilities and strategies that must increase consistently overtime and enable teachers react appropriately to academic dynamics including professional training, lesson delivery, effective use of instructional materials, teachers communication skills, provision of effective role model, effective discipline and students control, improve conditions of service and most importantly, quality of classroom assessment to determine the needs of his/her learners in the learning process (Gimba, 2010).

2. **Infrastructure development**: Special needs education receives full support from the government as seen from the Education standard that pays attention to the management of facilities and infrastructure in schools. Facilities and infrastructures that are comfortable and friendly to the needs, uniqueness of students are an indication that the implementation of facilities and infrastructure management in the school is good. Infrastructure management is a cooperation mechanism related to all equipment and the use of all educational equipment so that it is more effective and efficient, getting quality education services is the right of every learner without exception so that children with special needs also get maximum services. The visual, physical and motor function challenged students should have easy access to learning environment (classroom) (Symeonidou, 2018).

3. **Community engagement and awareness:** there is need for all-round involvement of stake holders in education to ensure high quality of education for the exceptional or special needs children as well as adult community members who are the first custodians of these groups of people. The higher percentage of exceptional children with special needs around in our communities. Community engagement and awareness in special needs education will go a long way to solve the problems of exceptional children. Chiefs, villagers and family heads of various communities can encourage parents with disabled, disadvantage children to come forward for attention instead of hiding them as a result of shame and myths associated with such group of people. There should be community based vocational centers for children with special needs. The special need persons with the belief that after training, the handicapped will acquire the necessary skills which will help them to be able to live in the community, mix socially and if possible, work among their people (Obi, 2005).

4. **Partnerships with organizations and stakeholders:** UNESCO is one of the international organization that advocated for equitable quality education and promote lifelong learning opportunities for all, including people with special needs (UNESCO, 2019). The Global Action Programme (GAP) on Education for Sustainable Development (ESD) was launched by UNESCO as a follow up to the United Nation Decade of ESD in

order to accelerate progress on sustainable development and scale up action in all areas of education and learning. It advocated for effective learning environment, quality/equality education, self-independent, gender indiscrimination, employment opportunities and future prospects for children with special need.

UNESCO partner with key stakeholders such as: government agencies (e.g. Federal Ministry of Education), Educational Institutions (e.g. universities, schools), Organizations (e.g. National Commission for Person with Disabilities), communities and parents, private sector companies (e.g. technology providers), civil society, and private sectors to leverage innovative technology and pedagogical strategies for sustainable development on special needs education.

Conclusion

Leveraging innovative technology and pedagogical strategies can enhance special needs education in Nigeria, and promoting quality education for all. By addressing the challenges and implementing best practices, Nigeria can make significant progress towards achieving the Sustainable Development Goals. Special needs education requires special programmes and services, facilities resources beyond those required by the general education. Also, innovations are needed in its practice to strengthen and maximize its services deliverables to its numerous clients in Nigeria. Given this situation therefore, proper attention must be paid to some of the innovative strategies for functionality and sustainability of special needs education as a discipline. Besides, adequate and functional legislation enforcing special needs education provision in Nigeria can no longer be toyed with else we are doing a disservice to both individuals with special learning needs and the nation in general.

Recommendation

1. Government should develop and implement more policies on special needs education for awareness, acceptability and integration among other peoples in the society.
2. Government should provide adequate training and support for teachers and educators to boost and widen their knowledge about students with special needs education.
3. Government should invest in infrastructure development, ensuring that schools are accessible and equipped with necessary resources.
4. Government should foster community engagement and partnerships to promote students with special needs education.

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Exploring the Role of Citizenship Extension Education in Confronting Contemporary Social Challenges in Nigeria

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Abstract

This paper examines the role of citizenship education, delivered through extension education, in addressing Nigeria's contemporary social challenges such as insecurity, poor health, food insecurity, and civic apathy. Grounded in Biesta's (2012) theory of public pedagogy and Schugurensky's (2010) dimensions of citizenship, the paper explores how agricultural, health, environmental, and home economics extension programs can promote civic responsibility, national integration, and sustainable development. Emphasis is placed on participatory appraisal methods that empower communities to assess and address their own needs. The study concludes that integrating citizenship education into both formal and non-formal systems is essential for building an inclusive, just, and informed society. Recommendations include: embedding citizenship education in curricula at all levels, strengthening public awareness through media and the National Orientation Agency, encouraging civil society and private sector involvement in civic training, and protecting citizens' rights through active human rights advocacy.

***Keywords*:** *citizenship education*, Extension education, challenges of extension education

Introduction

A citizen is a legal member of a community, state, or nation, with both rights and responsibilities (Fedeiye, 1997). The role of citizens in national development is critical, encompassing duties such as obeying laws, promoting peace especially in a heterogeneous society as well as actively contributing to the country's economic growth. Nigeria, as the most populous country in Africa with an estimated population of over 227.9 million (NPC, 2022), holds significant potential for development. However, this population boom has contributed to escalating civic challenges such as insecurity, youth unemployment (33.3%, NBS 2023), voter apathy, corruption, religious intolerance, fake news, and political violence.

Many countries give much regards to citizenship education at all levels of learning. The education is been provided by governmental, non-governmental and private institutions in quest to promote that patriotism among citizenry. The inter- section between the citizenship education and extension education is glaring, as citizens are oftentimes conscious of their roles in the society; this aspect of education is raising their conscious to understand that their roles are to be achieved towards sustainable national integration and development for several upcoming generations.

Despite various education reforms such as the introduction of civic education in school curricula and the Universal Basic Education (UBE) program, the gaps remain in preparing citizens to critically engage in nation-building. These reforms often focus on rote knowledge delivery rather than experiential, value-driven, and participatory learning models that build civic consciousness and responsibility.

This paper argues that integrating **citizenship education** through **extension education programmes** offers a more holistic, grassroots-oriented solution to Nigeria's civic crisis. It adopts a conceptual and theoretical approach, drawing on Biesta's (2012) public pedagogy and Schugurensky's (2010) multidimensional model of citizenship education. The paper examines how agricultural, health, environmental, and home economics extension services can be leveraged to educate and empower citizens to address real-life societal challenges. It also explores participatory

appraisal techniques to connect citizens directly with issues such as food security, health promotion, and environmental sustainability. Ultimately, this paper aims to highlight actionable pathways to building an informed, engaged, and responsible citizenry capable of contributing to Nigeria's democratic and developmental aspirations

Concept of Citizenship in Nigeria

The Citizenship Education was initially perceived to be a Civic Education, and the word 'civic' originated from 'civitas' from a classic Greek work, which means 'city- state' that denotes inculcation of socio- political culture and stimulating loyalty via collective interest and participation into the state matters (Aliyu et al, 2021).

A Nigerian citizen is defined by the Nigerian Constitution as someone who is a member of the Nigerian nation, with the right to full political and civil rights, as well as the obligations that come with citizenship (FGN, 1999). According to Sections 25, 26 and 27 of the 1999 Constitution of the Federal Republic of Nigeria, there are primarily three ways to become a citizen: by birth, by registration, or by naturalization. Citizenship by birth is acquired through born in Nigeria or outside Nigeria before October 1, 1960 or after Independence: If their parent or grandparent was a member of a community indigenous to Nigeria. (FGN, 1999).

Definition of Citizenship Education

Citizenship education is defined as the process of imparting knowledge, skills, attitudes, and values to individuals to enable them to participate effectively in the affairs of their state (Bolaji, 2022). The education aims to develop informed, responsible, and active citizens who understand their rights and responsibilities within a democratic society (Jarvis, 2000). This education covers various aspects, including understanding laws, the democratic process, human rights, and social issues which overarchingly lead to sustainable development. Responsible citizenship is also an important educational issue. It has played a prominent role in the practices and the theories of adult and extension education, particularly for these authors that have associated adult education with social movements (e.g. Finger & Asun, 2001; Jarvis, 2000).

The formal citizenship education is usually curriculum-based, it is taught in the school such as civic education at the basic and the secondary schools levels in Nigeria. The focus is usually to equipt the students with the knowledge, skills, and values necessary to participate actively into the community works and contribute to democracy (Inuwa, 2021). The non-formal extension education activities focused on those out of school civic education programmes and activities targeting community health, political participation, economic independence, communal succor, patriotism, delivered by governmental agencies or departments such as National Orientation Agency (NOA), and the non-governmental organizations. The Nigerian National Policy on Education emphasized the component of national development and social change by instilling the national values such as patriotism, social responsibilities, harmonious coexistence, and democratic participation through citizenship education (NPE, 2013). **Features of Citizenship Education**

The following are the features of Citizenship education as identified by Toyin et al (2023):

- **Building Responsible Citizens**: Creating awareness for citizens to know and discharge their civic responsibilities. These responsibilities include the right citizens have over the nation, states, local authorities and vice-versa. For instance, it is the responsibility of the state to provide security, social amenities, health facilities and education to their citizens. Moreso, extension education teaches the citizens to understand that it

is their responsibility to respect the laws, protect the laws, promote their health and contribute to building economic growth.

- **Developing Civic Engagement**: Citizenship education promotes civic participation into the democratic activities. Citizenship education guides the electoral process and informs the citizens on party manifestations and interest for change in the state. It equips individuals with the knowledge, skills, and values necessary to be informed and engaged members of a democratic society. Through extension education initiatives, citizens are educated to focus on understanding democratic processes, human rights, and the legal system in discharging their constitutional rights.
- **Building an Inclusive Society**: Creating social justice and equity among citizens. The education promotes respect among the citizens irrespective of physical fitness, gender, and social status. Promote the attitude of brotherhoods, and ensure both governmental and non- governmental organizations have key role to play in national development.
- **Promote Democratic Values**: The right to vote and be voted for are known through citizenship education. Other enfranchisement is promoted through the citizenship education.
- **Building Skills and Competencies**: It promotes citizens' communications skills and engagement through creative ideas, participating in discussions and debates, and advocating for one's beliefs. It builds problem-solving and conflict resolution through identifying problems, finding solutions, and resolving conflicts constructively.
- **Community Involvement:** It promotes citizens participating in community projects, volunteering, and contributing to the well-being of the local area.

Theoretical Foundation of Citizenship Education

In Biesta's (2012) theorization, he embraces a concept of citizenship that is not based only on understanding citizens as consumers but also on the quality of living citizenship. The author distinguishes three different interpretations of public pedagogy that address educational interventions about citizenship, democracy, and the public sphere: (1) pedagogy for the public, where the role of education is to instruct citizens about citizenship and democracy; (2) pedagogy of the public, where the role of education is related with raising critical consciousness related to issues of public concern; and (3) pedagogy for publicness, where the role of education is to set activities that help citizens become public actors. He suggests acting out a concern for publicness that "is not about teaching individuals what they should be, nor about demanding from them that they learn, but is about forms of interruption that keep the opportunities for 'becoming public' open" (Biesta, 2012, p. 685).

Therefore, among these three interpretations of public pedagogy, the author advocates pedagogy for publicness, because this is a domain where "action is possible and freedom can appear" (Biesta, 2012, p. 693; cf. Wildemeersch, 2017, pp. 118-119). If we relate these three approaches to public pedagogy with his three purposes or domains of education – qualification, which aims at providing people with knowledge and competencies, socialization, which aims at helping people become members of a particular social, cultural, and political "order", and subjectification, which aims at helping people become autonomous singular subjects (Biesta, 2020) – then we can argue that pedagogy for publicness is oriented toward the subjectification purpose of education.

Table 1: Mapping Biesta's Dimensions of Citizenship Education to Nigerian Civic Learning Activities

Biesta's Dimension	Key Focus	Examples of Nigerian Civic Learning Activities	Extension Education Implication
Socialization	Transmission of Societal norms, values, and roles	NYSC orientation programmes Citizenship and Civic Education curriculum in schools	Develop extension curricula that reinforce national unity, cooperation, and cultural respect
Qualification	Equipping learners with knowledge and skills to function in society	INEC voter education workshops Skills acquisition programs	Train facilitators to deliver practical knowledge (e.g., how to vote, rights/ responsibilities)
Subjectification	Encouraging personal agency and independent thought	Youth Town Halls Debate/Essay competitions on governance -	Design extension activities that promote voice, agency, and critical engagement in local issue

Biesta (2012) emphasizes education that cultivates citizens' ability to engage in public life, express opinions, and act in the collective interest. In Nigerian extension education, this principle can guide:

- Using the community-based scenarios (e.g., budget tracking, sanitation advocacy, participation) to stimulate dialogue and decision-making between the citizens and the power holders on national issues. Integrate critical questioning and problem- solving tasks into health, environmental, and agricultural sessions. These include issues like demand for affordable fertilizer before raining seasons and subsidy for agro- chemicals for effective farming. Similar demands goes for effective health services, qualitative products, good roads, plantation of trees for better environmental cares.

Dimension of Citizenship Education Citizenship is a multi-dimensional concept; it is necessary to identify and understand the different analytical dimensions of citizenship education. Schugurensky (2010), identified four dimensions of citizenship education:

- **Citizenship education as an identity**: This connects to all education programs that relates to adults belonging to a political community. The education activities happening in terms of membership, supports, participation in the political hemisphere of the political community. These are also education programs focusing on the identity dimension of citizenship emphasize nation-building, assimilation of minorities and migrants, and attitudes of loyalty to the host country.

- **Citizenship education as a status**: These are education programs that relates to the legal membership of a nation-state. It gives the citizen right to decides what is good for the country as a member and criticize policies that are hinderance to the development or peace of his/her country. For instance, when citizens are well educated, they can peacefully criticize government policies that are not favorable to them and mandate the government improve in their decisions.

- **Citizenship Education as civic virtues:** This relates to relates to the values and attitudes of "good citizens". It entails education programs that are directly focusing on the civic virtues of citizenship. It emphasizes the relevance associated with educating a citizen to become good member of the community and contributes towards positive society through virtuous actions. This means being a good and just person, showing integrity, and participating actively in civic life. It's a broader concept that encompasses various positive qualities and behaviors that make a person a valuable member of society.
- **Citizenship Education as an Agency:** This refers to the state of educating citizens for being in action or be the cause affecting positive changes. They are educations programs focusing on the agency dimension of citizenship which promote an active membership in a country.
- This could take different directions, by focusing on responsible citizens who olunteer, recycle, pay taxes, etc. It took the dimension of teaching citizens to be Extension Education for Sustainable Citizenship

  Extension Education is the education that is designed to reach out knowledge and skills of some governmental and non- governmental institutions to individuals beyond traditional classroom settings. Mostly this kind of education programmes are offered by the colleges, universities, ministries, international or multi-national agencies. It covers a wide range of programmes including agriculture, health, home economics, environmental and industrial education or technology (Inuwa & Abubakar, 2016, Shaik, 2023).

  The principles of extension education premised within the idea of need and interest, cultural diversity, adaptation, grass root interest, rule of leadership, whole- family approach, relevance, impact oriented, efficiency and accountability (Shaik, 2023). The following provides guidance on how extension education programmes create sustainable citizenry in Nigeria:

  Agricultural Extension Education: This denotes the services of agricultural systems that assist farmers through educational activities to improve their farming methods and techniques, increasing production, efficiency, income and better the standards of living of the famers (Mauder, 1973, Inuwa & Abubakar, 2016). Citizens are educated on the importance of feeding the nation. They are enlightened on the use of farm management, participatory and active in civic affairs and social life in the community. fertilizer applications, chemical and pest control, farm operations, storage and formation of cooperative societies to burst the national economic growth and their personal incomes. Several Governmental and Non-Governmental organizations have the mandate to ensure efficient mobilization and use of appropriate education for the citizens to push for food security in the country. The key officers concerns in ensuring citizens commitments to feeding the nation are the Agricultural extension workers, research institutions, cooperative officers and universities.

  Using a participatory appraisal process in extension education empowers citizens to assess their own food and nutrition situations and to identify the underlying causes of these problems from their own perspectives. This community-based approach encourages local ownership and relevance in problem-solving. Information for such appraisals can be collected through a variety of methods, including semi-structured individual or group interviews, visualization techniques, participant observation, and active listening to cultural traditions. Creative approaches such as popular theatre, role-playing, games, and community celebrations can also be effective in engaging people and drawing out valuable insights.

In addition, local institutions and agricultural extension workers serve as important sources of information. The extension workers can use analytical tools such as seasonal calendars, ranking exercises, community maps, and time charts to further support the community in analyzing patterns and identifying sustainable agricultural development.

Health Extension Education: This is an aspect of education that aimed at improving the quality of life of the citizenry and their welfare, environment and general conditions. The provision of healthier citizens requires an effective health extension services support provided by the relevant agencies and ministries and expert in the country. Most countries spend a lot of their budget on curative medicines. However, as rooted from the ancient idea, a Greek Scholar, Hippocrates brought the idea of "prevention is better than cure." The extension service support is on preventive medicines which cost less and serve effective purpose for creating a healthier citizenry in a nation. Experts in the medical line; such as Nurses, Doctors, Health and environmental sanitation extension workers engage in preventive health education to the citizens as a way of reducing the cost of health care services. These includes the monthly sanitations, avoid open defecation especially in rural areas, treating water before taking, regular hand washing with either soap or ashes, and using simple chemicals to reduce the spread of mosquitoes around the environment. Deploying community health workers, like Health Extension Workers (HEWs), to provide essential health services, health education, and promote preventative care will significantly improve the health of the nation. The more the state and federal budgets can be spent on other aspects of the nation building rather than curative medications.

This entails citizenry education to maintain correct eating balance, eat good food, avoid toxic foods, maintain good drinking water, maintain hygiene and wash hands regularly. It also focus on educating the citizens on endemic and sexually transmitted diseases Health extension education focusses on improving the welfare and environment of the citizens through various programmes such as food nutrition and child protections (Inuwa and Abubakar, 2016). The healthier the citizens, the stronger they will become in nation building nation.

Environmental Extension Education: This is a process of social learning aiming to enhance citizenry understanding of their environment issues and their impact on their health. One of the important resolutions of United Nations on environment under agenda 21 specified the need to increase environmental awareness and undertake public education programmes on natural resources management (UNCED, 1992). Citizenship education in this context can be perceived at the level micro and macro environmental issues. Such environmental issues could be at the community level (micro) whereas some of them are at the national or international (Macro) levels.

According to Tyler and Miller (1991), the micro environmental issues include:

- **Indoor air Pollution**: This includes the issue of poor ventilation, mold and pollutants at home.
- **Water Quality**: This includes the issues of contaminated water points and drinking water source, such as wells, streams, rivers and the water supplies to the cities.
- **Waste Management**: This is about improper disposal of domestic waste within the community, ineffective use of recyclables and hazardous resources.
- **Noise Pollution**: These are the noise pollutants such as traffic lights, industrial work and constructions activities. Appropriate use of dissipation and reflection of the cars and tri-cycle

silencers as well as using the hybrid mobility to reduce noise and air pollutions.

- **Pest Control**: Infestation of pest such as rodents or insects at home or buildings.

However, the macro environmental issues include the following:

- **Climatic Changes:** These are the issues of global warming and associated impacts like sea level rise, extreme weather events such as increasing heat of the planet.
- **Air Pollutions:** It includes pollution of the atmosphere such as particulate matters, ozone, nitrogen dioxides, bush burning and industrial smokes and pollution of the environment.
- **Deforestation**: These include the issues of cutting down trees, burning trees for charcoal, cutting forest for house wood without replacements causing biodiversity, ecosystem disruptions including erosions.
- **Water Scarcity**: Draining of lakes, insufficient access to clean water which affects human consumption, agriculture and industries.

- However, experts like environmental extension workers, civil society organizations, agronomist and botanist, University lecturers, mass communications and development workers oftentimes engage in educating citizens on the issues around micro and macro environmental issues with the aim of having saved biotic and abiotic nature around the globe. Citizenry education on environmental safety can have significant impact on the human health, ecosystem and the economy. **Home Economics Extension Education**: This is an aspect of extension education that prepares citizens on home management practices and nutrition, child care, rearing, and family planning (Inuwa & Abubakar, 2016). Citizens are prepared on skills and knowledge for managing daily life including:

- **Nutrition and Meal Planning:** Creating a healthy citizen by making them understand healthy eating, meal preparation, balance diets and maintenance of body system through exercise.
- **House Hold Management:** Making citizen to management limited resources for better living. This includes house hold financial management such as budgeting, savings,cooperatives,time management, skills acquisitions and working for extra funds for the family.

  Food Safety and Preservations: Avoidance of wastage and creating various strategies for saving food by the citizens. This also has to do with food storage and preservation techniques to have hunger-free living citizens in the country.

- **Family and Child Development:** Educating citizens on parenting skills, child development and family relationships for better generations. This also educate citizens in breast feeding the child, family planning, using locally produced foods for effective child nourishments, and love for the baby to control effective growth, patriotism and unified country have hunger-free living citizens in the country.
- **Family and Child Development:** Educating citizens on parenting skills, child development and family relationships for better generations. This also educate citizens in breast feeding the child, family planning, using locally produced foods for effective child nourishments, and love for the baby to control effective growth, patriotism and unified country.

Experts such as nurses, adult education specialist, nutritionist, teachers, tourist, health and community extension workers deliver such education to the community. The extension education benefits to citizens in this context ranges from an improved household management, healthier lifestyle, increased self-sufficiency, enhanced family relations; create patriotic citizenry and productive community.

Conclusion

In addressing Nigeria's complex and evolving social challenges, the integration of citizenship education through extension education programmes offers a strategic and transformative pathway. Citizenship education, grounded in Biesta's (2012) theoretical framework and enriched by Schugurensky's (2010) dimensions,

Application of citizenship education in all the curriculum and extension education programmes will help in solving real-life problems. By extending education to the grassroots, Nigeria can better confront issues such as poverty, environmental degradation, health crises, and civic apathy. Therefore, integrating citizenship and extension education into formal and non- formal educational systems is not merely desirable, but essential for building a more inclusive, just, and sustainable society.

Recommendations

- The Federal Ministry of Education, in collaboration with NERDC, should integrate Citizenship and Extension Education into the Basic and Secondary Education Curriculum during the curriculum review, concentrating on democratic values, rights, respon- sibilities, environmental protection, public health, and agricultural innovation.

- Government ministries and agencies of the federal and states as well as the higher institutions should work together to train new sets of extension educators with specializations in health, agriculture, and environmental education for better informed citizens.

- Local governments, with support from CSOs and donor agencies, should establish at least one Community Citizenship Learning Center per state to provide participatory civic training, community dialogue, and local development planning.

- The National Orientation Agency (NOA) should partner with radio, television, and social media will equips Nigerians with the critical thinking, civic responsibility, and participatory skills required for active engagement in national development. Through various forms of extension education, knowledge, practice and attitudes of citizens can be better empowered to improve their commitments in agricultural, health, environmental, and home economics practices.

  platforms to launch a 12- month civic awareness campaign starting January 2026, aiming to reach at least 10 million Nigerians, particularly youths and marginalized populations.

- NGOs and extension educators should begin incorporating PRA tools like community mapping, seasonal calendars, and role plays into their outreach programs to encourage active citizen engagement and problem- solving.

- A survey should be conducted in selected communities to measure civic knowledge, participation in community development, and social responsibility of the citizens in an effort to address issues of citizens' participation and contribution to the national unity and development.

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Effect of Fieldtrip Exercise on Students' Academic Performance in Social Studies in Colleges of Education in North-West Nigeria

By

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Abstract

This paper examines the Effect of Fieldtrip Exercise on Students' Academic Performance in Social Studies in Colleges of Education North-West Nigeria. The objectives were to determine difference in academic performance of students in researcher-made test before and after fieldtrip and determine differences in academic performance of female students in researcher- made test before and after fieldtrip. The research adopted quasi-experimental of pre-test post- test, two (2) research questions and two (2) hypotheses were developed and answered through mean, standard deviation and t-test independent sample. The sample consist of two hundred and twenty-nine (291) Social Studies students of 200 Level in Colleges of Education that offered SOS 214 (Social Studies Fieldtrip) with double major combination. The researcher- made test was used as an instrument. The findings showed that, students' academic performance in Social Studies significantly improved after participating in fieldtrip exercise and there is significant improvement in academic performance among female students after participating in fieldtrip exercise. Therefore, this study is significant because it highlights the importance of fieldtrip exercise in teaching and learning social studies. And the study also recommends that utilizing social studies fieldtrip teaching techniques will enhance learning and promotes students experience in the discipline.

Keywords: *Fieldtrip*, Social Studies, Students, Academic Performance

Introduction

Teaching and learning process provides training of mind and promotes acquisition of skills. On this note, Dhandhania (2020) opines that Social Studies is a social science discipline which deals with human behaviour, growth and development, relationships, resources they use and various institutions they require to function and carry on their life smoothly. According to Dhandhania (2020) the importance of Social Studies in school curriculum was to help children develop an awareness of the world and environment, helps to develop critical thinking abilities, helps to enhance the social understanding of students, learning about different religions, social and cultural beliefs, castes and creed, nationalities and ethnicity values, languages and festivals. Social Studies also helps students to become better citizens by training their mind on political ideologies, constitutional laws, citizenship, rights and duties, morals and virtues, social code of conduct and many more information and knowledge, skills and attitudes. Nevertheless, Okabiah (1980) in Halilu (2019) believes that the perception of Social Studies curriculum in terms of understanding of human relationships is aim at producing citizens with skills, competencies, moral values and reasoned judgments to effectively live, interact and contribute positively to the economic, social and political development of the Nigerian society.

Brown and Brown (2019) perceived fieldtrip or field-studies as an outdoor learning exercise undertaken by teachers and students in certain aspects of subjects such as Social Studies, so as to give the students the opportunity to acquire knowledge. It is a kind of learning that is based on experiences which take students out of their usual classroom setting to a new types of learning environment.

Nevertheless, Garba (2013) reiterates that right from the introduction of Social Studies in Nigerian schools, its potentials in promoting the beliefs, values and ethics of inter-cultural understanding and tolerance have never been doubted. From the foregoing, Mathew and Idowu (2022), it is pertinent to ascertain that fieldtrip provide great access for students to learn, adapt to, and tolerate diverse cultures as citizens of the global community. Academic performance is a quite important task in promoting learning experiences in Social Studies. Nkereowajiro (2014) posited that determining students' academic performance is not an easy task because student performance depends on various goals and criteria resulting from numerous subject areas and different subject teachers and instructors. Each of these resource persons impact their experiences which in one way or the other build up to influence the system cannot be attributed to the effort of a single teacher. Academic performance is the measurement of student achievement across academic subjects. Teachers and education officials typically measure graduation rates and results from standardized tests.

Narad and Abdullah (2016) view academic performance as the knowledge gained which is assessed by marks by a teacher and/or educational goals set by students and teachers to be achieved over a specific period of time. However, Yusuf, Onifade and Bello (2016) opined that academic performance is a measurable and observable behaviour of a student within a specific period. While Martha (2009) emphasized that academic performance of students is defined by a students' performance in an examination, tests and in a course work. Therefore, Social Studies fieldtrip exercise also as a learning experience in the field of learning can nhance and facilitated academic performance.

Statement of the Problem

Teacher of Social Studies use many methods and strategies for content delivery with a lot of observations which requires attentions of both curriculum planners and policy makers. The National Commission for Colleges of Education (NCCE) which is by law saddled with the responsibility of preparing and updating from time the curriculum of all Colleges of Education saw it imperative to adopt fieldtrip as one of the courses and experience that N.C.E students must undergo in their programme. This is as a result of observations made by many participants at the periodic review of NCE minimum standards that most of the conventional methods employed by lecturers for teaching Social Studies failed to give desired result. Therefore, the participants i.e. students saw the need for incorporating fieldtrip which is more practical in nature and see how it could improve the academic programme in general now that it is almost 12 years in the NCE minimum standards and pass two consequential reviews.

Research Objectives

The study aimed to achieve the following objectives:

1. to determine the differences in the academic performance of students in researcher-made test before and after fieldtrip exercise in Colleges of Education in North-west Nigeria, and
2. to determine the differences in the academic performance of students in researcher-made test before and after fieldtrip exercise in Colleges of Education in North-west Nigeria, and
3. to determine difference in the academic performance of female students in researcher- made test before and after fieldtrip exercise in Colleges of Education in North-west Nigeria.

Research Questions

The study aimed to answer the following questions:

1. Is there significant difference in academic performance of students in researcher-made test before and after Social Studies fieldtrip exercise in Colleges of Education in North- west Nigeria?
2. To what extent do female students' academic performance differ in researcher-made test before and after social studies fieldtrip exercise in Colleges of Education in North- west Nigeria?

Hypotheses

Ho1: There is no significant difference in the academic performance of students in researcher-made test before and after fieldtrip exercise in Colleges of Education in North- west Nigeria.

Ho2: There is no significant difference in the academic performance of female students in researcher-made test before and after fieldtrip exercise in Colleges of Education in North- west Nigeria.

Theoretical Framework

Social studies as a discipline was designed with aim of training children on how to become good members of the society Based on this assertion, Edinyang (2016) emphasizes that Social Studies embraces the various fields which involves past and current human behaviour and interactions, help to project the positive values of human behaviour and the consequences of negative vices.

Theoretical Framework

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Social studies learners according to Edinyang et al (2015) were actively involved in the teaching-learning process as they were expected to replicate the content of the unwritten curriculum. The indigenous curriculum is in line with Bandura's theory on modeling and imitation.

A variety of teaching method such as role- playing, games, observation, demonstration, limitation, inquiring, self- teaching and learning and peer teaching were used to transmit societal norms and values to the younger generation.

The theory of academic performance (TOP) was developed by Elger (2007). The theory emphasis on foundational concepts to form a framework that can be used to explain performance as well as performance improvement. To perform is to produce valued results.

A performer can be an individual or a group of people engaging in a performance depends holistically on six components: Context, level of knowledge, level of skills, level of identity, personal factors and fixed factors. While three axioms are proposed for effective performance immersion in encircling environment and theory of performance (TOP) is useful in many traditional contexts.

The theory informs learning in classrooms, workshop and other venues (which include place of interest uses by fieldtrip) that associated with learning.

The research conducted has proved that the theory of academic performance (TOP) has relevance to fieldtrip exercise in Social Studies because findings revealed that, there is significant improvement in academic performance after students have participate in fieldtrip.

Methodology

Quasi experimental design of pre-test post- test was used for this study. A sample of two hundred and ninety-one (291) Social Studies students of NCE 200 level Social Studies double major combination were selected from seven (7) Colleges of Education in North-west Nigeria. t-test independent sample was used to test the research hypotheses because t-test is effective in establishing differences that exist between two variables before and after attending fieldtrip.

Results Presentation and Analysis

1. Analysis of Research Questions

Research Question One: Is there any difference in the academic performance of students in researcher-made test before and after Social Studies fieldtrip exercises in Colleges of Education in North-west Nigeria?

Table 1: Summary of Mean Performance Scores of Students before and after Social Studies Fieldtrip

Variable	*N*	Mean	*S.D*	*Mean Difference*
Pre-test	291	39.57	8.12	
				10.79
Post-test	291	50.36	8.56	

The result from Table 1 shows the summary of mean performance scores for students before and after a Social Studies fieldtrip exercise in Colleges of Education in North- west Nigeria, with a focus on assessing differences in academic performance. For the pre-test phase, involving 291 students, the mean score was 39.57 with a standard deviation of 8.12. In contrast, for the post- test phase, the mean score increased to 50.36 with a standard deviation of 8.56. The mean difference between the pre-test and post-test scores was calculated to be 10.79. The increase in mean scores suggests a positive impact of the fieldtrip exercise on academic performance in Social Studies among the students in this study.

Research Question 2: To what extent female students' academic performance differ in researcher made test before and after fieldtrip exercise in colleges of Education in North West, Nigeria

Table 2: Summary of Mean Female Students' Performance Score for Pre-test and Post-test

Group	*N*	Mean	S.D	Mean Difference
Pre-Test	142	39.82	8.37	10.72
Post-Test	142	50.54	8.79	

Table 2 presented shows the results of the pre-test and post-test for the female students (N=142). For the pre-test, the mean score was 39.82 with a standard deviation of 8.37.For the post-test, administered after the fieldtrip exercise, the mean score was higher at 50.54 with a standard deviation of 8.79. The mean difference between the pre- test and post- test scores was 10.72 points. after completing the fieldtrip exercise, compared to their scores on the pre-test administered before. This suggests their academic performance improved or differed positively after participating in the fieldtrip exercise.

The results show that on average, the female students scored higher on the post- test administered test before and after Social Studies fieldtrip exercises in Colleges of Education in North- west Nigeria.

2. Test of Hypothesis

Null Hypothesis One: There is no significant difference in academic performance of students in researcher-made fieldtrip exercises in Colleges of Education in North- west Nigeria.

Table 3: Independent Samples t-test Analysis of Students Academic Performance before and after fieldtrip exercise.

Group	N	Mean	SD	t-value	*df*	p-value	Decision
Pre-test	291	39.57	8.12	19.36	290	0.00	
Post-test	291	50.36	8.56				**Significant**

The result of the t-test in table 3 shows that there is a statistically significant difference between the mean post-test scores of students after fieldtrip exercise (M=50.36, SD=8.56) and before field exercise (M=39.57, SD=8.12), $t(290) = 19.36$, $p < 0.05$. Since the p-value is below 0.05, Null Hypothesis Three is rejected. This suggests that engaging in the fieldtrip significantly improved academic performance, resulting in better learning outcomes for students after the fieldtrip compared to before the exercise.

Null Hypothesis Two: There is no significant difference in the academic performance of female students in researcher-made test before and after fieldtrip exercises in Colleges of Education in North-west Nigeria

Table 4: Paired Samples T-Test Analysis of Academic Performance of Female Students Group

	N	Mean	*S.D*	*t*	*df*	*p*	Decision
Post-Test	142	50.54	8.79				
Pre-Test	142	39.82	8.37	13.15	141	.000	**Significant**

The result of Table 4 shows the results of a paired samples t-test comparing the pre-test and post-test scores of 142 female students. The mean score on the pre-test was 39.82 with a standard deviation of 8.37. The mean score on the post-test was 50.54 with a standard deviation of 8.79. The t-statistic was 13.15 with 141 degrees of freedom and a p-value of 0.000. Since the p-value is less than 0.05, we can reject the null hypothesis. There is a statistically significant difference in the academic performance of female students before and after the fieldtrip exercise, as measured by their scores on the pre-test and post-test. Specifically, their average score increased from 39.82 to 50.54 after participating in the fieldtrip.

Discussion of Findings

The results indicated that the students' academic performance in social studies significantly improved after participating in a fieldtrip exercise. This improvement could be attributed to the fact that participating in the fieldtrip allows for greater engagement in learning process, assisting students in paying attention, remembering information, and applying it to real-world situations. This finding aligns with research that shows fieldtrip are more effective for enhancing achievement than conventional lecture methods (Egwu & Okigbo, 2012; Expo & Ehi, 2022).

Besides, the results indicating a significant improvement in academic performance among female students after engaging in a social studies fieldtrip exercise align with previous research on the educational benefits of experiential learning. Several studies have highlighted how fieldtrip can enhance understanding, critical thinking and retention of academic material by providing real-world contexts and hands-on experiences to reinforce classroom concepts (Adejoh, et al., 2012; Egwe & Okigbo, 2021). This findings adds to the body of evidence showing positive impacts of fieldtrip one learning outcomes, demonstrating the value of incorporating experiential activities into academic instruction. Based on the research, it was also revealed that academic performance of female students increases after attending fieldtrip exercises despite culture and other norms that may affect female participation in the exercise.

Conclusion

The findings revealed that fieldtrip had a significant positive impact on academic performance of students and also academic performance of female students by considering the culture of the area of study. Also, it was discovered that fieldtrip exercise enhances improvement among social studies students and also help them to acquire more learning experience within the environment.

Recommendations

1. Universities, institutes of education, colleges of education and poly- techniques should act as change agents, particularly in supporting and ensuring that fieldtrip is being subscribed to so as to maximize learning benefits in Social Studies and perhaps other curriculum areas.
2. The benefits of fieldtrip in enhancing teaching and learning experiences is immense it the therefore recommended that TETFUND should intervene by way of supporting logically in the planning and execution of fieldtrip especially in teacher education institutions in Nigeria.
3. Social Studies teachers should utilize other teaching techniques like fieldtrip exercise that will expose students with learning outside the classroom environment and also expose them to many concepts in their real life situations.

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Revolutionizing Social Studies Classroom: AI Tools for Interactive and Critical Thinking

By

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Abstract

The integration of Artificial Intelligence (AI) into education has opened new possibilities for transforming the teaching and learning of social studies. This paper explores how AI tools can revolutionize the social studies class room by promoting interactive critical thinking, and student-centered learning. Traditionally reviewed as content-heavy and teacher directed social studies education now stands at the threshold of innovation, where AI driven applications such as intelligent tutoring systems, chat bots, data visualization platforms, and virtual simulation can reframe how student engage with historical events, civic concept, cultural diversity and global issues. Drawing on classroom-based experiences, current research, and case studies, this presentation examines the potential of AI to foster inquiry-based learning, enhance student's analytical skills, and personalize educational content to meet diverse learning needs. It also discusses how AI can assist teachers in assessment curriculum design, and real time feedback thereby reshaping pedagogical practices. Equally important are the ethical implications of AI use, including concerns around data privacy, algorithmic bias, and equitable access-especially in under resourced educational context. This paper concludes by offering practical recommendations for integrating AjI tools meaningfully into social studies instruction, advocating for a critical and inclusive approach that equips students to become thoughtful, informed and responsible globall citizens in an AI influenced World

***Keywords*:** *Social Studies*, Artificial Intelligence, AI tools, Interactive, Critical Thinking

Introduction

The landscape of education is undergoing a significant transformation driven on the rapid evolution of technology and the growing demand for innovative pedagogical approaches. Among theses, Artificial Intelligence (AI) has emerged as a powerful force in reshaping teaching and learning across disciplines. In social studies education, the adoption of AI tools offers an unprecedented opportunity to move beyond traditional didactic methods towards mere interactive, critical and students cantered practice. Mitchel, (2017) notes, "new technologies are not just tools they are instruments of transformation," and in the context of social studies, this transformation holds profound implications for how knowledge is constructed, driven and applied.

Traditionally, social studies classroom has been anchored in content delivery focused on historical facts, civic structures and geographical concepts. While foundation of knowledge remains important, this approach often falls short of developing the critical thinking, analytical reasoning and civic engagement necessary for students to navigate an increasingly complex world Freire Paulo (1970) famously critiqued this "banking model" of education, in which students are seen as empty vessels to be filled with information, advocating instead for a pedagogy that empowered learners to question, analyze and transform their realities. AI tools, when thoughtfully integrated, align with this vision by fostering interactive experience where students engage in inquiry, dialogue and reflection.

In recent years, AI has expanded from theoretical computer science for practical applications in education. Tools such as intelligent tutoring systems, natural language. Processing based chatbots data analytics platforms, and AI-driven simulations are now being used to personalize learning, provide real-time feedback, and support diverse learners. According to Luckin et al (2016), AI in education enables "a more nuanced understanding of students learning processes," helping educators tailor instruction based on individual strength and needs. In the social studies classroom, this means that students can engage with historical narratives through innovative simulations, analyze social patterns using AI-assisted data tools, and debate civic issues with AI-supported prompts that scaffold critical dialogue.

Furthermore, the integration of AI opens new avenues for cultivating 21st century skills, including digital literacy, ethical reasoning and global awareness skills that are central to the mission of social studies. For example, AI can assist in teaching media literacy by helping students detect misinformation and assess the credibility of online sources, a crucial competence in an era of digital disinformation. As Selwyn (2019) argues, "education must not only respond to technological change but also critically engage with it," suggesting that AI is presence in the classroom should be accompanied by discussion around ethics privacy, bias, and social impact.

However, the development of AI in education also arises significant questions, whose knowledge is being encoded into AI systems? How do we ensure equity in access to AI enhanced tools? And what safeguard are in place to prevent the reinforcement of bias or surveillance practices? These concerns are practically relevant in social studies, where issues of justice, inclusion, and power are central to both content and pedagogy.

This paper explores how AI tools can be harnessed to revolutinalize social studies education by promoting interactivity, critical engagement and personalized learning. It begins by reviewing relevant literature on AI in education, followed by an analysis of specific AI applications suited to social studies instructions. This paper then discusses the pedagogical, ethical and practical implications of AI integration offering recommendation for educators and policy makers. Ultimately, it argues that AI when aligned with human central pedagogy, holds the potentials to not only enhanced how social studies is taught, but also deepen, how it is understood, questioned and applied by learners in a rapidly changing world.

Social Studies Classroom

The student- centered active learning process within which the teacher is merely a guide is the focal point of contemporary education system. Active learning is a learning process in which the learner takes responsibility of his/her learning and he or she is given the opportunity to make decision about various dimension of the learning process and perform self-regulation (Akinoglu & Tandogan 2007)

Social studies education is aimed at enriching the Nigeria child with appropriate attitudes values and skills for effective living. It is a liberal education that furnishes a greater understanding of mankind (Ezegbe, 2008).

Despite the significant role of social studies education, the subject has been poorly taught in our schools which have resulted to student's poor achievement (Ubah, 2001, Oncioha, 2010).

Okam (2002), Ugwu (2003) and Ololobou (2004observed that social studies is one of the most poorly taught subjects in our schools. They blamed this on a number of factors which range from shortage of qualified social studies teacher, lack of proper use of teaching methods, lack of appropriate textbooks and the teaching strategies or techniques.

Dike (2002) in Otoja & Ipenyi (2016) opined that if the teaching of social studies is to be meaningful, a method must be evolved that will allow for reflective thinking. Students learn by being engaged actively. As a person it is not an empty vessel to be filled with information, knowledge that empowers and increases learners self confidence that which results from coming together of individuals actions, feelings and conscious thought (Novak 2009). (Okam 2002), argued that the teacher is the most important factor in any teaching /learning episode and therefore ignorance of suitable method(s) will drastically affect the performance of the students. Educationist appears to suggest that a method like drama, discussion, inquiry, questioning and problem solving enhances active participation of the learners in the learning process. As educationist continued to brainstorm on possible ways to improve the teaching of social studies, one of the many strategies that have the potentials to put learners at the centre of their learning is through discussion method (Kuzhe, 2011).

Group discussion/interactive method is a consensus learning strategy in which participants put heads together and contribute worthwhile ideas or personal views that aid them arrive at a conclusion on the topic of discussion. Group discussion attempts to identify whether candidate have desire level of give and take approach and ability to work as effective member.

Group discussion/ interactive teaching strategy found its way into social studies classroom as a result of strong emphasis in social learning (Ololobou, (2004). The social learning theorist conceptionalized learning as collective not individualistic. How much learning occurs as a result of interaction. Social studies teaching should be sequentially in a way and manner that students are actively involved to enhance learning performance and to ensure higher retention of what is learnt. It is one thing to teach social studies using appropriate method and another for the learner to remember after some reasonable period must have elapsed, which is retention. Retention is the ability of an organization to store, retain, and recall information. Social studies concepts should be presented to the students such that they touch their consciousness. It further implies that any pedagogical strategy adopted to improve achievement should be to improve students retentive ability in the subject, since retention in social studies is not acquired by mere memorization but through appropriate teaching approach.

Effective teaching requires a thorough understanding of the learning process, characteristics of students at different stages Of development; individual differences and factors that influence retention that lead to critical thinking, which all translate to improve achievement. It is in the light of the foregoing that the paper explores the influence of AI tools for revolutionizing social studies classroom for interactive and critical thinking. In conventional lecture method, the students have been reviewed as a retainer of, rather than processor of experience, and information.

This traditional view of learning is usually evidenced by a piece of verbal behaviour being emitted to a stimulus such as written or verbal questioning.

Social studies teachers needs to re-assess their classroom instructional practice because there is need for them to shift from instructional practice which makes learners passive listeners to the one that engages learners actively in the instructional processes.

Social studies education is rooted in preparing students for democratic participation, which requires the ability to think critically, engage in dialogue and understand historical and civic complexities. This aligns closely with constructivist learning theory, which holds that learners build knowledge through active engagement with content and social interaction.

According to Vygotsky (1978) "learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment." AI tools can serve as "interactive others" offering students opportunities to explore, questions and construct knowledge with responsive system. Teachers must embrace technologies not as instrument of transmission but as tools for transformation- Freire (1970) participation, which requires the ability to think critically, engage in dialogue and understand historical and civic complexities. This aligns closely with constructivist learning theory, which holds that learners build knowledge through active engagement with content and social interaction.

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Types of AI (by Capacity):

1. Narrow AI (Weak AI)
   - Specific tasks (e.g voice assistance, recommendation system).
2. Example: ChatGPT, Google Translate, Grammarly)
3. General AI (Strong AI)
   - Hypothetical AI with human-level intelligence and reasoning
   - Still under research
4. Super Intelligence AI
   - AI that surpasses human intelligence (theoretical /future concept

Types of AI (by Functionality):

1. Reactive Machines
   - No memory: responds only to current input
   - Example: IBM's Deep Blue chess engine
2. Limited Memory AI
   - Uses past data for decisions
   - Examples: Self-driving cars, virtual assistants
3. Theory of Mind AI

- Can understand human emotions and intentions (still
- Self-Aware AI
- Has consciousness and self-awareness (not yet developed).

Categories of AI Tools (by task):

Category	Examples
Natural language processing (NLP)	ChatGPT, Bard Grammarly
Speech Recognition	Otter, ai Google speech to-text
Computer Vision	Google lense, facial recognition systems
Machine Learning platforms	Tensorflow, pyTorch
AI for Data Analysis	IBM Watson, Tableau AI, Power Bi Copilot
AI for Education	Khanmigo, scribe Sense, Socratic (by Google)

The Role of AI in Interactive Learning

Research consistently highlights AI's potential to foster interactive learning environment. For Example, Hao et-al. (2025) mapping student – AI interaction Dynamic in multi-Agent learning environments. Furthermore, Holmes, Bilalik and Fadel (2019) highlight that AI fosters interactivity by tailoring learning experiences to individual student profiles, ensuring that learners remain challenged yet supported. The use of virtual tutors & AI chatbots also created dialogic spaces where students can explore ideas, ask questions, and receive instant guidance (Winkler & Sollner, 2018). This aligns with Vygotsky's (1978) social constructivist theory, where learning occurs through active interaction and mediated support. By leveraging these capabilities, AI does not replace the teacher but enhances instructional interactivity and supports student's agency in the learning process. AI introduces a new dimension to interactively, by enabling real-time, personalized and dynamic responses. Unlike static textbooks, AI empowered tools allow students to explore historical events, civic processes and ethical dilemmas through responsive simulations and tailored dialogues.

For instance, AI chatbots, can be programmed to simulate figures like Abraham Lincoln, or a modern political analyst. When student engages the AI with a question like "why did the emancipation proclamation matter? The AI can provide contextually rich answers while prompting following questions. Teachers described this as "heavy a second pair of hands that provokes deeper thinking"

According to Holmes et al (2021) AI- powered platforms such as intelligent tutoring system (ITS) and adaptive learning technologies personalized instruction based on learners cognitive patterns hereby enhancing engagement.

In social studies, this interactively is crucial for contextualizing societal structures. For instance, chat bots and virtual simulations can replicate historical debates or civic scenarios allowing students to participate actively in reconstructions of historical moments Lu et al, 2021). These tools enable learner to move beyond passive consumption of information towards immersive participatory educational experiences. Moreover, tools like adaptive learning platforms (e.g century Tech or Squirrel AI) respond to each students learning pace and gaps. This creates opportunities for differentiated instruction. A student struggling with the Bill of rights for example might be guided through custom analogies or legal cases suited to their level. AI has the power to make learning a conversation rather than a lecture". Luckin et al (2016). Generative AI platforms like ChatGPT can helps students brainstorm positions for debates, generates outline for argumentative essays, even simulate discussion around controversial issues such as climate policy or immigration.

However, without intentional design, this interactivity risks becoming shallow or mechanical. AI must be guided by pedagogical goals, nor merely technological novelty.

AI and Critical Thinking in Social Studies

The integration of artificial intelligence (AI) tools in social studies education holds immense promise for enhancing critical thinking – a Cornerstone of democratic participation and informed citizenship. Critical thinking in the social studies classroom involves the ability to analyze historical narratives, evaluate diverse perspective, question sources and draw reasoned conclusions based on evidence (Wineburg, 2001).

AI, tools, when thoughtfully implemented, can serve as catalysts for this intellectual engagement by enabling personalized learning, real-time feedback and simulation that mirror complex socio-political realities.

AI's power lies in the capacity to process and generate data-driven insights that students can interrogate for example, tools such as ChatGPT or other AI chatbots can simulate historical figures or stakeholders in a debate, allowing students to engage in dialogue learning. As Zhao 2023) asserts, "AI technologies when embedded within curricular frame works, can support critical inquiry by offering alternate viewpoints and modeling argumentation. This simulation capability encourages learners to move beyond rote memorization and begin to wrestle with the ambiguity and contestation inherent in historical and civic discourse.

Moreover, AI can foster Meta cognitive awareness by prompting students to reflect on their reasoning processes. Intelligent tutoring systems and AI- driven platforms can offer instant feedback on student's argument structures, source usage and logical coherence. According to Holmes et al (2021) "AI – enhanced feedback system promote deeper learning by making students cognitive processes visible and subject to revision." In the context of social studies this means students can iteratively improve their arguments on historical causation, ethical reasoning, or policy evaluation.

Another important aspect is AI's potential to support inquiry–based learning and project- based pedagogy. Tools like AI powered database, digital archives and content generators allows students to explore authentic questions using real word data. However, the use of AI in fostering critical thinking must be carefully scaffold without intentional guidance there is a risk that students might uncritically accept AI- generated content as authoritative. Teachers must model skepticism, source verification and ethical reflection when engaging with AI. As McGrew et al (2019) warn, "Students must learn to ask not just, what it says? But who is behind this information and why?

AI literacy, therefore, becomes a parallel competency to critical thinking in the AI-infused social studies classroom.

Furthermore, AI can democratize access to high quality learning materials particularly in under resourced schools. Tools that adapt to individual learners, paces and needs can help bridge educational gaps, making critical engagement more equitable. As Darling Hammond et al (2020) emphasize equity in educational means not just equal access to pedagogies that challenge students to think critically and creatively.

AI-tools when embedded within inquiry based and civically engaged pedagogies can significantly enhance critical thinking in social studies. These tools must not be used to replace human judgment, but to augment the reflective analytical and evaluative processes central to democratic learning. The educator's role remains essentials to curating, mediating and contextualizing AI- generated information. As we navigate these digital frontiers, the mission of social studies to prepare thoughtful, informed and active citizens can be powerfully supported by the judicious use of AI.

Implications for Educators and Policy Makers

The integration of Artificial Intelligence (AI) tools in to the social studies classroom carries profound implications for both educations and policy makers.

For educators, the emergence of AI as an instructionally demands a paradigm shift in pedagogical, practice. Teachers must move beyond traditional knowledge transmission and embrace roles as facilitators of inquiry, members of critical thinking, and curators of digital resources (Luckin et al 2016; Holmes et al 2019). To do so effectively, educators require sustained professional development focused on digital literacy, ethical AI use, and the design of interactive, students centered learning experiences.

Moreover, educators must cultivate students, capacity to question AI-generated content, recognize algorithm biases, and validate information through cross-referencing and critical discussion. This shifts the educational focus from rote memorization to active engagement with knowledge, fostering a generation of learners who are both technologically fluent and civically informed (Mechta, J & Fine, S (2019).

For policy makers, the integration of AI into education necessities investments in infrastructure, teacher training and equitable access to technology. Policy must also address the digital divide that may marginalize under-resourced schools and communities, ensuring inclusive implementation (UNESCO)

Additionally, frameworks should be developed to guide the ethical development of AI in classrooms, protecting student data privacy and promoting responsible AI use. Curricular reforms are also essential.

Social studies standards should be updated to incorporate competencies related to AI literacy, digital citizenship, and critical inquiry.

Policy makers must collaborate with educators' technologist and curriculum developers to ensure that AI enhances democratic education rather than undermining it (Wilkamson & Eyron, (2020).

In sum, AI's presence in the social studies classroom is not a neutral development – it is a transformative force that requires intentional pedagogical adaptation and strategic policy support. Only through such collaboration can AI be harnessed to prepare students for thoughtful, informed participation in an increasingly complex world.

Challenges and Limitations

While the integration of AI tools into social studies education offers transformative potentials, it also presents several significant challenges and limitations that must be critically examined.

Digital Divide and Equity Issues:- One of the foremost challenges is the persistent digital divide. Access to AI technologies remains uneven across geographic, socio- economic, and institutional lines. Students in under-resourced schools may lack reliable internet, updated device or exposure to advanced digital tools in many regions, especially rural or under resourced areas, there is a lack of reliable internet connectivity, up to date hard work and ongoing technical support (UNESCO 2021). This disparity risks widening the educational gap between privileged and disadvantage students.

Teachers Readiness: - is another critical limitation. The integration of AI in the classroom demands a new set of digital and pedagogical competences that many educators may not yet possess. A lack of training in AI applications and uncertainty about how to align these tools with curriculum goals can result in underutilization or misuse (Zawacki- Richter et al 2019) without ingoing professional development, even well- design AI tools may fail to achieve their intended educational impact.

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Another limitation is the lack of culturally relevant AI content. Many AI tools are designed in contexts that may not align with local histories, values or pedagogical approaches.

This misalignment can limit the tools effectiveness in promoting meaningful engagement with soc

Lastly, there is the concern of over reliance on technology. While AI can enhance learning, it should not replace the human dimensions of teaching such as empathy, dialogue and moral reasoning which are particularly vital in social studies education. The risk of depersonised learning experiences must be carefully balanced with the opportunities AI provides for personalization and efficiency.

While AI presents transformative possibilities, its successful integration in social studies classroom depends on addressing systematic inequities, investing in teacher capacity, upholding ethical standards, and ensuring cultural and pedagogical relevance.

Recognizing and preparing for these challenges is essential for realizing the full potentials of AI in education.

Conclusion

The integration of Artificial Intelligence (AI) tools in to the social studies classroom signals a pivotal shift in educational practice-one that prioritizes interactivity, personalization, and the cultivation of critical thinking. As traditional methods of instruction increasingly fall short in engaging learners with complex social realities, AI technologies offer innovation pathways for exploration, analysis and participatory learning. Through intelligent tutoring system, adaptive simulations and data informed feedback mechanisms, students can actively construct knowledge, questions in ways previously unattainable through conventional pedagogies.

However, this transformation is not automatic. Realizing the potential of AI in social studies education requires intentional, equity focused strategies supported by robust policy frameworks and informed educational leadership. Teacher must be empowered with the tools, training and professional support to adopt AI meaningfully. Simultaneously ethical consideration such as data privacy, algorithms transparency and cultural responsiveness must be addressed to safeguard learners and ensure inclusive access.

Recommendations

1. Teachers training and capacity professional development programs should prioritize AI literacy, including hands on experience with relevant tools, pedagogical integration strategies, and digital ethics. Training must be ongoing and context sensitive.
2. Policy and infrastructure Development policy makers should invest in equitable digital infrastructure, particularly for underserved schools. National and State policies must also guide the ethical and educational use of AI, ensuring it aligns with curricular goals and human rights standards.
3. Curriculum innovation- social studies curricular should be revised to incorporate AI not merely as technical skills but as a pedagogical enhancer. Curriculum designers should collaborate with educators and technologist to ensure AI tools support inquiry, dialogue and historical thinking.
4. Research Innovation further research is needed to evaluate the impact of AI on learning outcomes, student's engagement, and critical thinking in social studies, pilot programms and case studies can inform scalable evidence-based implementations.

The futures of social studies education lies in its ability to evolve with the times while remaining rooted in democratic values and critical inquiry. AI when responsibly integrated has the power to not only enrich classroom experiences but also equip students with the analytical tools needed to navigate and shape an increasingly complex world

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Exploring a Decade of Adult Learning and Education: Case Study of the Activities of the Nigerian National Council for Adult Education (NNCAE) 2014 -2024

By

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Abstract

Adult and non-formal education has evolved from basic literacy initiatives to a holistic lifelong learning framework vital for sustainable development, yet in Nigeria 31 percent of adults remain illiterate, and 18.3 million children are out of school. This study analyzes NNCAE's advocacy, governance reforms, partnerships, and research dissemination from 2014 to 2024 through document review of some of its activities in the promotion of adult education as a tool of human capital development and literacy advancement in Nigeria. Over this decade, the council expanded membership via state chapters, digitized records, reactivated its website, secured representation on the NMEC board, and affiliated with the International Council for Adult Education; it also co- launched the Olusegun Obasanjo Literacy Legacy Fund. Annual conferences and a now-biannual journal amplified its influence alongside collaborations with UNESCO, NOGALSS, UBEC, and other government bodies. Persistent challenges include inadequate, unstable funding; limited accreditation representation; internal fragmentation; and absence of legislative recognition. To sustain momentum, NNCAE must pursue strategic funding models, legal status, and enhanced roles in accreditation and policy making

Keywords: *Adult and Non-Formal Education,* Lifelong Learning, Nigerian National Council for Adult Education (NNCAE), Policy Advocacy & Literacy Development

Introduction

Adult Education has made a long evolutionary journey from being merely a second-chance opportunity for illiterate adults to acquire basic literacy and numeracy skills; to a comprehensive canvas for providing education for all, throughout life, as lifelong and life-wide learning (Eheazu, 1998) especially addressing human capital development gap as well as social and political development challenges. Ojoketa (2021) maintained that besides, the Fifth UNESCO International Conference on Adult Education (CONFINTEA V) held in Hamburg, Germany in 1997 linked Adult Education with sustainable and equitable human development, job creation, income generation, democracy and the overall goals of social development. Moreover, thee UNESCO Conference (CONFINTEA V1) held in Belem, Brazil in 2009 stressed the broadness of Adult Education as an "imperative for the achievement of equity and inclusion, for alleviating poverty and for building equitable, tolerant, sustainable and knowledge-based societies". These views led to the universal recognition that Adult Education is too important to be left to second chance. It is an all-encompassing activity that is aimed at addressing greater economic and social development challenges.

Based on these broad submissions, Fasakun (2006) opined that it becomes imperative for all scholars and practitioners of Adult Education to begin to think of the next-level agenda for Adult Learning and Education practice on country-wide basis. As Adult Educators, we need to understand that contemporary society, especially in the developing world, is harsh and cannot be treated using traditional or known practices Omolewa (1985). There is need for us to critically think both within and outside the box by

involving all actors in the governance of Adult Education because majority of the victims of dehumanization are clients of Adult Education. For example, today in Nigeria we have over 31% representing about 62 million out of the Nigeria's estimated 200 million are without literacy and over 18.3 million Nigerian children are out of school (Ladan, Galtimari, and Biu, 2024). All these are as a result of the dehumanization happening in our country for which we need to set a sustainable agenda**.** The Nigerian National Council for Adult Education (NNCAE) was formed in 1971 and since then has been working on the improvement of Adult and Non-Formal Education through research, collaborations, conferences, workshops, mentoring, advocacy and publication. The broader aim of this paper is to underscore the current and project the future of role of NNCAE in adult education and development within the Nigerian context. This is relevant especially in addressing the major gaps of illiteracy, inequality, disempowerment and social exclusion affecting humankind.

Adult and non-formal education have been identified as an important instrument through which any country can attain development. It is on this belief that government and people of Nigeria have taken the issue of how to increase literacy rates among children and adults as an important one. Tahir (2005) cited in Omolewa and Kester (2021) opined that various interest groups have continued to advocate for and support the universalization of access to education in Nigeria. One of such groups is the Nigerian National Council for Adult Education (NNCAE). Omolewa and Kester (2021) opined that the NNCAE was one of the few innovative movements that struggles for, and ensures the survival of Adult Education both as a movement and as an area of academic discipline in Nigeria. Over the past five decades Adult Education has made a long evolutionary journey from being merely a second-chance opportunity for illiterate adults to acquire basic literacy and numeracy skill; to a comprehensive discipline for providing educational opportunities for all irrespective of age, location and level of previous education through the efforts of the Nigerian National Council for Adult Education. The paper is structured give the role and objectives of NNCAE as non-state actor in support of adult education from 27th March 1971 to date. It also discusses its achievement in the area of advocacy, research and establishment of adult education institutions within the Nigerian context. The role of annual conferences of NNCAE in shaping policy around adult and nonformal education.

The NNCAE as an Actor in Adult Education Promotion in Nigeria

The NNCAE was established on 27th March, 1971 as an aftermath of a conference of Adult Educators and Practitioners in Kano. The idea of establishing the Council was muted several scholars and practitioners in the field of Adult and Non – Formal Education whose major concern was to promote adult education and community development at 'national, state and local levels in the Federal Republic of Nigeria' (Tahir, 2005 cited in Omolea and Kester (2021). Thereafter, the Council came into existence through consultations, interactions and discussions involving University academics and Adult Education Practitioners. The council was therefore a brainchild of governmental and Non – Governmental bodies that had the vision of making adult education better organized and recognized both as a field of discipline and as a professional career (Omolewa, 2021). The Nigerian National Council for Adult Education (NNCAE) celebrated its 50 years anniversary of its inauguration in 2021 with several events such as a National conference, launching of a Book of Readings, giving awards to the founding fathers and

people that have contributed to the development of Adult and Non-formal Education theory and practice in Nigeria.

At the inception period, the first and probably the most difficult task to achieve was mobilization for the cause of adult education. Subsequent tasks depended on the success of effectively convincing and mobilizing academics and practitioners in the field to appreciate then the existing problems of Adult Education and to see the need for a change through the NNCAE. Ladan (2017) observed, resistance to change is more pronounced during initiation of an innovation than it may later on as individuals, group, and opinion leaders get actively involved and speak in favour of an idea, resistance is lowered. This task was not an easy one, as the stage began the process of shared vision.

This stage started the process of change for adult education in the country. Together, members built their vision of a desired change as propounded by Eheazu, 1998) and supported by Ojoketa (2021).

During the period of its inception, especially during the last decade, the Council had recorded huge progress by serving as an effective pressure group that influenced successive Nigerian governments to pay more attention to adult and non-formal education in terms of policy articulation and programme implementation, funding, management and evaluation. It affectively became a strong voice for adult education in Nigeria. The Council also encouraged Universities to set up units and departments and learning programmes and its journal, became a leading academic forum in Nigeria and around the world (Omolewa (1985). Ladan (2024) added that the NNCAE succeeded in internationalizing Nigerian adult education by affiliating with international NGOs such as UNESCO, AALAE, ICAE and a host of others.

Goals of the NNCAE

Omolewa and Kester (2021) stated that the goals of the Council were aptly stated by Prof.

E. A. Tugbiyele the founding President of the NNCAE as follows:

a) To promote a means of communication for those interested in Adult Education: This is about finding ways of communicating to different target audiences of adult education.

professional recognition of full time workers

b) To represent the best interests of Adult Educations in working with various levels of government:

c) To promote co – operation among Adult Education, Community Development and other Agencies and the Co – Ordination of their programmes.

d) To stimulate training programmes and the development of needed literature.

e) To identify problems on which research may be needed and to initiative and support such research projects; and

f) To publish an Adult Education Journal to disseminate information and research throughout Nigeria and the world.

g) To work for the enhanced status and greater

Achievements of the NNCAE

Almost all the goals outlined as visualized by the founders of the Council had, over a period, been achieved through various policies, conventions, conferences and other academic activities (Ladan, 2024). The NNCAE had played, in particular, a leading role in driving aggressive campaigns and advocacy at the governmental and university levels in order to ensure that adult education programme had been included at various stages of the academic cycle. For example it is on record that the NNCAE set up a Task Force Committee on writing a proposal for a National Adult Education Programme, for inclusion

in the Third National Development Plan (1975 – 1980). The proposal had been received by the Federal Ministries of Education and Economic Planning. The proposal also received favourable comments from many of the relevant ministries in the States, UNESCO as well as from internationally reputed educationists and organizations (Tahir, 2005). Specifically, Ojoketa (2021) outlined the following achievements of the NNCAE:

a) The NNCAE became a voice for Adult and Non-Formal education in Nigeria and its intervention led to the inclusion of Adult and Non-Formal education in the National Policy on Education

b) The inclusion of adult and non-formal education in the National Policy on Education in Nigeria led to the creation of a special budget for it at the government and University levels.

c) The NNCAE facilitated UNDP"s support for the production of journals and materials for the advancement of adult and non-formal education in the 1990s in Nigeria.

d) The strong advocacy and intense activities of the NNCAE culminated in recognition of adult education as field of study in Nigeria Universities and the establishment of a department of Adult Directorate of Employment, Women Affairs Commission and the National Orientation Agency.

j) Through the activities of the NNCAE, adult Education at the Federal Ministry of Education in 1974. The NNCAE wrote a proposal for the inclusion of Adult Education programme in the Third National Development plan of 175-1980 and the proposal produced positive results.

The NNCAE mounted an aggressive campaign for Nigeria to conduct National Mass Literacy Campaign which eventually held in 1982. This education became deeply entrenched in the academic and political landscape of Nigeria and the International Community.

In the decade under review (2014-2024), the NNCAE has grown from strength to strength and has been at the fore front of promoting adult education research and practice, below are some of its achievements as outlined by Ladan (2024): led to the declaration of1982-1992 as National

The NNCAE is now a member of the Governing Mass Literacy Campaign Decade in Nigeria. Board of NMEC, The NNCAE was instrumental to the creation

i. The NNCAE has set up sound and all Literacy Legacy Fund to be domiciled at UNESCO that will serve as additional source Immediate Past Presidents, Prof. Fatima Umar and Prof. L. K. Kazeem. Of funding literacy attainment among

ii. Creating NNCAE State Chapters throughout Nigerians. Reactivating inclusive of the act that led to the emergence of the leadership that moved the council forward.

iii. Registration of the NNCAE with the International (NMEC), Adult and Non-Formal Education Council for Adult Education (ICAE) and State Agencies for Mass Education

iv. Consolidation of the annual conference and (SAMEs). The NNCAE was also instrumental to the publication of the National Council for Adult Education Journal. Establishment of the Kano State Agency for

v. Reactivation of the NNCAE website Mass Education which won UNESCO (www.nncae.org) Literacy Award in 1983. The strong advocacy of the NNCAE also informed the establishment of the National Open University of Nigeria,

The National Nomadic Education Commission and the then National Digitization of the membership list and increasing its visibility globally Increased institutional membership of the council Together with Non- Governmental Association

x. Keeping in touch with NMEC, UBEC and the for Literacy Support Services (NOGALSS) the FMOE NNCAE is floating the Olusegun Obasanjo

xi. Floating Book of Readings in Honour of the partnership with the National Assembly, UNESCO and NOGALSS Nigeria Annual Conferences Held by the NNCAE **in the Last Decade**

Table 1: List of National conferences organized by the NNCAE

Year	Venue	Theme
2011	Lokoja. Kogi State	Adult and Non-formal Education, Informal Learning, and the Issues of Difference and Diversity in Building the Culture of Democracy and Attaining Sustainable Livelihoods
2012	Obafemi Awolowo University, Ife	Adult Education and Adult Educators of My/Our Dream(s): Setting Agenda for Adult Education Practice, Research and Politics
2013	No conference was organized due to logistic reasons	
2014	University of Ilorin, Kwara State	Experiential Learning, Adult Education and Community Development for Justice and Peace: Empowering Harmony in Nigeria
2015	University of Lagos, Lagos Education	Addressing The Challenges To Adult And Non-Formal
2016	State Alvan Ikoku Federal COE, Owerri, Imo State	Practice In Contemporary Times Adult and Lifelong Learning in Economic Challenging Times
2017	Abuja, FCT	Sustainable Development Goals (SDGs) 2016-2030: Setting Achievable Agenda for Adult and Lifelong Learning in Nigeria
2018	Bauchi, Bauchi State	Information And Communication Technology In Adult Education As Tool For Promoting Democratic Ideals
2019	University of Port Harcourt, Rivers State	Re-Positioning Adult Education For Social Transformation And Good Governance
2020	Ekiti State University, Ekiti State	Next-Level Agenda For Adult Learning And Education (ALE) Practice
2021	Abuja, FCT (50th Anniversary)	Celebrating The Vision And Resource Of Adult Education For Sustainable Development In Nigeria
2023	Ilesa	Changing Course: Transforming Adult Learning and Education in the light of Development Challenges
2024	Calabar	Expanding the Novel Orbits and the Reach of Adult Learning and Education for Humanization

Table 2: Leadership of the NNCAE in the Last Decade:

PERIOD	PRESIDENT	SECRETARY	EDITOR
2010 to 2014	Prof. C. Enuku	Prof. C. I. Imhabekhai/ Prof. K. L. Kazeem*	Dr. Mejuini
2014 to 2016	Prof. Fatima Umar	Prof. K. L. Kazeem	Prof. (Mrs.) L. A. Okukpon
2016 to 2018	Prof. Fatima Umar	Prof. K. L. Kazeem	Prof. (Mrs.) L. A. Okukpon
2018 to 2020	Prof. K. L. Kazeem	Dr. Babangida Ladan	Prof. C. Oladapo
2020 to 2023	Prof. K. L. Kazeem	Dr. Babangida Ladan	Prof. C. Oladapo
2023 to date	Dr. Babangida Ladan	Dr. Mbalisi Onyeka Festus	Prof. Kester

*Prof. K. L. Kazeem took over in 2012 after the death of Prof. C. I. Imhabekhai.

Current Executives Running the Council from 2023 to Date:

S/N	POSITION	NAME	ADDRESS
1.	President	Dr. Babangida Ladan	Bayero University, Kano
2.	1st Vice President	Dr. C. N. Olori	University of Nigeria, Nsukka
3.	2nd Vice President	Dr. Lawrence Shola Ige	University of Lagos
4.	National Secretary	Dr. F. O. Mbalisi	University of Port Harcourt
5.	Assistant Secretary	Dr. A. C. Babalola	Obafemi Awolowo University, Ife
6.	Financial Secretary	Mrs. Rose Ebohon	F. C. E, Kontagora
7.	National Editor	Prof. K. O. Kester	University of Ibadan
8.	Deputy Editor	Dr. Elizabeth Ajayi	AAU Akungba
9.	Treasurer	Mr. Sadiq Toyin Kayode	University of Ilorin
10.	Auditor	Dr. Daramola Tayo	University of Ilesa
11.	Publicity Secretary	Dr. Henry Peterside	
12.	NMEC Rep	Dr. John Edeh	NMEC, Abuja
13.	University Rep	Prof. Blessing Ayinkwa	University of Lagos
14.	SAME Rep	Dr. Abbas Muhammad	Jigawa State Agency for Mass Educatio
15.	Ex-officio	Prof. Labayo K. Kazeem	University of Ibadan

Members of the Board of Trustees as at 2025:

S/N	NAME	REPRESENTING	RANK
1.	Prof. Michael Omolewa	South-West Zone	Chairman
2.	Prof. Ben Eheazu	South-South Zone	Member
3.	Prof. Muhammad Gurama Dukku	North-East Zone	Member
4.	Prof. Fatima Umar	North-West Zone	Member
5.	Prof. A. A. Fajonyomi	North-Central Zone	Member
6.	Prof. Stella Nwizu	South-East Zone	Member
7.	Prof. S. I. Akpama	Representing NMEC	Member
8.	Mr. Godfrey I. Akara	Representing SAMEs	Member
9.	Dr. Babangida Ladan	NNCAE Executive Council	Secretary

Challenges Faced by the NNCAE

Nzeneri (2008) opined that Adult Education as an enterprise in Nigeria must face some challenges for which all actors must put hands on deck to see that those challenges do not hamper proper implementation and realization of set objectives.

Some of the challenges faced might be those arising from a system failure, competition or lack of understanding of the discipline. Contemporarily therefore the NNCEA face the following challenges:

1. Lack of adequate and sustainable funding- As at now the NNCAE rely heavily of members annual dues which are grossly inadequate in supporting the various activities of the council.
2. Inability of the NNCAE to be represented (as a body) in the accreditation of adult education programmes by agencies and institutions of government. The NNCAE is by right required to be represented on the Board of relevant government parastatals.
3. The noticeable disintegration which had crept into the Council in the last couple of years. Noticeable among this, is the issue of emerging individuals and groups, coming together to form parallel associations with virtually the same vision and focus of the Council.
4. The task of making the Council a Professional body recognized by appropriate legislation.

Future Ambition of the NNCAE

The following are paramount at this age, so that NNCAE can leave on the realities of contemporary adult education practice:

i) Securing a sustainable funding for its activities
ii) Increasing the visibility of our journal in recognized online citation index.
iii) Hosting virtual workshops for building capacity of members.
iv) Strengthening the State branches and making them functional.
v) Strengthening our networks with relevant agencies (International and Local) to promote the visibility, understanding and practice of Adult Education in Nigeria through advocacy, media campaigns and publication
vi) The immediate process of enlisting the representation of NNCAE on the board of other relevant government parastatals (Nomadic Education Commission; National Commission for Almajiri and Out of School Children and UBEC);
vii) Our conference to have international outlook and possibly support.
viii) Scouting for more sponsors and political support for the council

Conclusion

Adult learning and education has received the required attention in Nigeria has received the required from all its stakeholders. Both government and non-governmental organizations has made the necessary provisions for its theory and practice through policy, advocacy and research. The NNCAE as an important actor in adult education practice was formed to serve as an umbrella organization of all adult and non-formal education academics and practitioners to promote adult and non-formal education through advocacy, research, conference, workshop, monitoring and publication in Nigeria. In the decade under review, the NNCAE has recorded appreciable amount of success in all those areas in Nigeria. he successes were recorded amidst some daunting challenges for which immediate attention is required to enable the council to achieve its ambition for the next decade.

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Influence of Students' Perception of Difficult Concepts in Biology and its Effects on Academic Achievements in Science and Technical Schools of Kano State-Nigeria

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Abstract

The study aimed at examining the influence of students' perception of difficult concepts in Biology and its effects on academic achievement in science and technical schools of Kano state. Three research questions and three hypotheses were formulated to guide the study. A descriptive survey research design was used for the study. A population of 7491 SS II students were used for the study. Proportionate sampling technique was used to draw samples of 365 students using Krejcie and Morgan table with 248 male and 117 female. Two Instruments BDCQ and BAT were faced validated by experts in the field; the reliability coefficients for the instruments were found to be 0.76 and 0.78 respectively. Mean and standard deviation were used to answer the research questions, while z-test and PPMCC were used to test the hypotheses at 0.05 level of significance. The results revealed that there is significant difference between the mean perception scores of male and female biology students towards Biology difficult concepts, there is significant relationship between students' perception of difficult concepts in Biology and their academic achievements. It was recommended that measures should be taken in order to improve students perceptions positively towards Biology

Keywords: *Academic achievement,* Biology, Difficult concepts, Perceptions.

Introduction and Background to the Study

Science is not only a topic of study but also the basis upon which most things around us today are built. It is a corpus of information, an approach or methodology, and a mode of thought in the quest for a comprehension of nature. Olorundare (2014) defines science as an interdisciplinary human endeavor that entails a methodical, organized exploration and comprehension of the world, nature, and cosmos. In order to cultivate an inquiring, rational mind for the conduct of a good life and democracy, produce science for national development, service studies in technology, and cause the technological development and understanding of the complexity of the physical development and conduct of life, the goal is to lead to fundamental, applied research and innovation in the sciences at all levels of education. and cause the technological development and understanding of the complexity of the physical development and conduct of life, the goal is to lead to fundamental, applied research and innovation in the sciences at all levels of education.

Education is the process of acquiring knowledge, skills, values, and attitudes. The purpose of education is to empower individuals to think critically, solve problems, communicate effectively, and contribute meaningfully to society. It plays a crucial role in personal development, social progress, and economic growth. It also refers to the process of instructing and preparing pupils in order to impart or convey their biological knowledge. According to Bichi, Ibrahim and Ibrahim (2019), education is regarded as a key that unlocks the development of potential personal and national values and all other kinds of rights and powers in the world.

According to Okenyi, (2018), the application of educational ideas to the teaching and learning of Biology is known as Biology education.

Biology education is the process of instructing and studying Biology to students with the intention of transmitting or transferring biological knowledge. The cardinal objectives of Biology education are to prepare students to acquire: adequate laboratory and field skills in Biology; meaningful and relevant knowledge in Biology, ability to apply scientific knowledge to everyday life in matter of personal and community health and agriculture and lastly reasonable and functional scientific attitudes (FGN141). In this wise, Biology teaching requires skillful, trained personnel with a sound mental aptitude coupled with effective strategies and methods to effectively impart the knowledge of Biology in order to promote quality Biology education. Biology education exposed learners to principles, concepts, processes and equip them with necessary practical skills, as the knowledge of naturemay help in solving many social problems relating to health, poverty, food shortage, crop production, environmental pollution and conversation (Adeoye, 2015). The study of Biology in senior secondary school can equip students with useful concept principles and theories that will enable them face the challenges before and after graduation. Biology is the study of the natural world and its environments, which was inspired by human curiosity (Nlewem, 2018). Biology is the term used to describe all of our prior understanding about living things. It is, therefore, the study of life. Abugu, (2020) stated that Biology is natural science in which we study living organisms' plants and animals. The knowledge of Biology helps in checking environmental degradation such as desertification, erosion, water hyacinth, land, air and water pollution. Biology could be defined as a natural science that deals with how the world is structured, how it functions and what these functions are, how it develops, how living things come into existence, and how they interact with one another and with their environment (Umar, 2011).

Biology, as a discipline, is an integral component of many fields of studies contributing greatly to the technological growth of the nation. Such fields include medicines, pharmacy, nursing, biotechnology, nanotechnology, and many other areas. Biology has helped in breakthroughs like test-tube babies, production of hybrids, production of genetically modified fruits and new methods of disease control and prevention in genetics, biotechnology, and agriculture. Biology is designed to produce educated individuals some of whom may or may not take to biological sciences in their professions but find it useful in their daily activities. In whatever professions they finally find themselves (Bayda B., T., , M. , & F., 2020).

It is great responsibility rest with teachers teaching science that to confirm student's positive attitude in science related subjects, but studies illustrate that in existing scenarios, students are showing lack of interest in learning science (Maranan, 2017) Students' achievement in science is greatly influenced by their attitudes. Positive attitude towards a subject brings about better students' academic achievement. Academic achievement is the outcome of learning which expresses the extent to which instructional objectives have been met (Kubiatko, 2013).

Academic achievement represents a performance outcome that indicates the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in schools. School systems mostly define cognitive goals that either apply across multiple subject areas e.g. critical thinking or include the acquisition of knowledge and understanding in a specific intellectual domain e.g., numeracy, literacy, science, history. Therefore, academic achievement should be considered to be a multifaceted construct that comprise different domains of learning. The field of academic achievement is very wide- ranging and covers a broad variety of educational outcomes. The definition of academic achievement depends on the indicators used to measure it. Among the many criteria that indicate academic achievement, there are very general indicators such as procedural and declarative knowledge acquired in an educational system, more curricular- based criteria such as grades or performance of an educational achievement tests are cumulative indicators of academic achievement such as educational degrees and certificates (Steinmayr, Meibner & Weidinger, 2014). It is important to understand students' academic achievement in order to help the teachers to guide the students to involve all their sense organs in the learning process for proper understanding so as to aid students' proper perception of the learning task. Perception is one of the concepts that are critically studied in psychology. Psychologists are more interested in what, when and how people perceive things and the possible effect it has on their behaviors. (Afzal, Rafiq, & Kanwal, 2023).

Mcshane and Glinow (2008) defined perception as the process of receiving information and the making sense of the world aroundus. Itentails deciding which information to notice, how to categorize this information, and how to interpret it within the framework of our existing knowledge. In other words, perception is the process of receiving information and stimuli from the surrounding environment, then interpreting the information and categorizing it in the framework of knowledge appropriately. Mahdum, Hadriana and Safriyanti (2019) argue that perception is more complex and broader compared to sensing process because perception includes difficult interactions from selection, compilation and interpretation activities.

Perception also depends on sensing which then occurs as a cognitive process that affects performance of students.Therefore, understanding secondary school students' perceptions of Biology will help policymakers, teachers and teacher educators plan more effective teaching activities that can help students learn Biology better and have more positive attitudes towards it.

Gender differences may perhaps influence students' perception and academic achievement in Biology difficult concepts. According to European Union (2020), gender differences in science achievement are the smallest. It was further stressed that girls tend to have a weaker self-concept in science, Biology inclusive than males, i.e., on average, girls had lower levels of belief in their science abilities than boys.

Yet, both boys and girls are similarly interested in science; and there is no overall difference in boys' and girls' inclination to use science in future studies or jobs. The reason why boys perceive biological concepts easier than girls could be attributed to socialization factors and classroom experiences leading to low self-esteem and passive dependent behavior among girls (Etobro & Fabinu, 2017). Students' lack of understanding of difficult concepts in Biology results in poor performance of students at SSCE and backwardness in scientific and technological advancement of our nation. Although, many factors may account for students' poor performance in Biology, it is evident that most students have difficulties in learning some Biology concepts (Agboghor & Oyovwi, 2015). This study is set to determine the influence of student's perception of difficult concepts in Biology and its effect on academic achievement and attitude in Science and Technical Schools in Kano State.

Statement of the Problem

In Nigeria, students' achievement in secondary school Biology has not been encouraging. In spite of the desire for technological development, which needs Biology education there is persistent poor academic achievement of students in the subject. Biology education is becoming increasingly challenging for students, leading to negative perceptions and subpar performance, as methods for understanding the subject impose a pessimistic mindset (Bichi, Ibrahim, & Ibrahim, 2019). So many factors can be attributed to student poor achievement in Biology concepts, they include teachers use of inappropriate instructional approaches, lack of adequate laboratory facilities, poor organization of laboratory activities, lack of commitment to laboratory work by both teachers and students, partial or total absence of laboratory, lack of qualified Biology teachers and mode of laboratory activities that are used in Biology laboratory (Bichi, Ibrahim, & Ibrahim, 2019). Despite the popularity of Biology, there has been consistent decline in the performance of students in public examinations conducted by the West African Examination Council (WAEC). In Sciences, The percentage of students that passed Biology at credits was very low compared to the total entry, in 2019- 48.8%, in 2020- 18.3%, in 2021-48.3% throughout the examination results. Therefore, the performance of Biology students was always below 50% of the total number students who offered Biology in the external examination (WAEC 2019-2021). Despite the fact that biology and other science related subjects are important to human progress still perform poorly in it as indicated in table 1. Downward trend in the students' performance (KERD, 2023) see table 1

Table 1:
Biology Students Performance in West African Senior Secondary Certificate Examination (WASSCE) from 2019 to 2023 in Kano State.

Year	No. of Registered Students	No. of Students Passed	% of students Passed	No. of Students Failed	% Students Failed
2019	250099	85034	34	165065	66
2020	289520	60799	21	228721	76
2021	326541	97962	30	228579	70
2022	367562	121295	33	246267	67
2023	367979	176629	48	191350	52

Source: Kano Educational Resource Department (KERD(, 2023

Research Questions

The following research questions were raised to guide the study.

i. What Biology concepts do students perceive as difficult in Science and Technical Schools in Kano State?

ii. What are the student perceptions of Biology difficult concepts in Science and technical Schools in Kano State?

Research Hypotheses

The research hypotheses were formulated and tested at the stipulated value of 0.05 significant level.

H01: There is no significant gender difference in the perception of Biology difficult concepts in Science and Technical Schools in Kano State.

H02: There is no significant relationship between the students' perception of difficult concepts in biology and academic achievement.

Research Design

In the study the dependent variables (academic achievement) as well as (attitude towards science) have already occurred. The researcher attempted to identify and compare the variables (without manipulating them) for the purpose of making inferences about their relationship. Therefore descriptive research design was adopted to find out and describe the influence of students' perception of difficult concepts in biology and its effect on academic achievement and attitude in science and technical schools in Kano state. A descriptive research design would be use in which the researcher seeks to determine whether, and to what degree, students' have difficulties in learning Biology and the relationship exists between students' learning difficulties and their attitude and academic achievement in Biology. Akweziulo and Agu (2021) defined descriptive research as one in which a researcher studies a group of people or items by collecting and analyzing data from only a few people or items considered to be the representative of the entire group.

Population/Sample of the Study

The target population for this study was all the biology students (SS2) of the Science and Technical schools in Kano state. Within the age range of 15-17years, majority of whom are from Hausa/Fulani Tribe within Kano State. The total number of SS2 Biology students is 7491. The Science consist of 4244 while the technical consist of 3247 drawn from all the Science and Technical Schools Board in the study area, comprising of 5081 Male and 2410 Female.

The sample size for this study is 365 respondents. This is based on the recommendation of Krejci and Morgan (1970), which provide a table of sample size determination. The table recommended that for the population of 7000 the sample size required is 364, the researcher used sample size calculation according to Krejci and Morgan formula to get the total population of 7491 in which the sample size is 365.

Instrumentation

The instruments for data collection in this study were Self-developed Questionnaire entitled Biology Difficult Concept Questionnaire (BDCQ) and Biology Achievement Test (BAT) which was adopted from WAEC past questions. The questionnaire was divided into two sections One and Two, Section 'One' dealt with the personal data such as respondent's school, class and gender. Section 'Two' was subdivided in to A, B, C and D, which were used to answer the research questions and hypotheses. These subsections provided information on the Biology concepts students perceived as difficult to learn in Senior Secondary Schools, information on the sources of the difficulties experienced by the students in Biology concepts in Senior Secondary Schools respectively.

The Instruments were given to three experts from the Department of Science and Technology Educational, Bayero University, Kano. The experts scrutinized, identified and corrected the mistakes on the questionnaire and also ensured that the instrument will measure what it is expected to measure. The corrections and suggestions given by the experts were used to produce final draft of the instrument.

To establish reliability of the research, instrument a pilot study was conducted. The research instrument was administered to thirty students in public secondary schools in Kano State in order to find out reliability coefficient (r). The students were not part of the sample for the study but have similar characteristics as those in the study area. Cronbach Alpha formula was used to analyze Questionnaire which was found to be 0.76, while Pearson Product Moment Correlation Coefficient (PPMCC) was used to find the reliability coefficient of the achievement test (BAT) and was found to be 0.78.

Results

The data collected in the course of the study were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. Mean and standard deviation in form of descriptive statistics were used for answering **Table 2:** research questions where the criteria for taking decision is 2.50, mean below 2.50 was disagreed while mean equal to 2.50 and above was Agreed. Independent z-test was used to test hypotheses one and two and Pearson Product Moment Correlation Coefficients (PPMCC) was used to answer hypotheses three and four all at 0.05 level of significance.

Research Question One: What Biology concepts do students perceive as difficult in Science and Technical Schools in Kano State?

Mean and Standard Deviation of Biology concepts students perceived as difficult in Science and Technical Schools in Kano State.

S/N	Biology Concept	N	$Mean(\bar{x})$	SD	Decision
1	Supporting Tissues in Plants	365	2.86	0.96	Difficult
2	Excretion	365	3.13	0.96	Difficult
3	Respiratory System	365	2.71	0.53	Difficult
4	Cell and its Environment	365	2.30	0.88	Not Difficult
5	Reproduction	365	1.77	0.77	Not Difficult
6	Plant and Animal Classification	365	2.01	0.63	Not Difficult
7	External and Internal structure of flowering plants	365	2.67	0.65	Difficult
8	Conservation of natural resources	365	1.92	0.55	Not Difficult
9	Germination of seeds	365	2.54	0.53	Difficult
10	Transport system in animals	365	2.15	0.59	Not Difficult
11	Tissues and supporting systems in animals	365	2.66	0.62	Difficult
12	Micro-organisms	365	2.65	0.55	Difficult
13	Metamorphosis in insects	365	2.36	0.76	Not Difficult
14	Ecology of population	365	2.58	0.57	Difficult
15	Irritability	365	2.30	0.71	Not Difficult
16	Tolerance	365	1.63	0.56	Not Difficult
17	Adaptation	365	1.66	0.64	Not Difficult

Benchmark: <2.50 is Not Difficult ≥ 2.50 Difficult

Table 2 shows the Biology concepts which were perceived difficult by the students. In the questionnaire the items were given 4 options (Highly difficult, difficult, moderately difficult and not difficult which were given points of 4, 3, 2 and 1 respectively). Mean value below 2.50 is not difficult while mean of 2.50 and above is Difficult. The level of difficultly increases as the mean approaches 4.0 while it reduces as it approaches 1.0. The topics perceived difficult by the students were: supporting tissues in plants, excretion, respiratory system, external and internal structure of flowering plants, germination of seeds, tissues and supporting systems in animals, micro-organisms and ecology of population. Those concepts perceived not difficult are: cell and its environment, reproduction, plant and animal classification, conservation of natural resources, transportation system in animals, metamorphosis in insects, irritability, tolerance and adaption.

Table 3:

Research Question Two: What are the student perceptions of Biology difficult concepts in Science and technical Schools in Kano State?

Mean and Standard Deviations of students' perceptions of Biology difficult concepts in science and technical schools. Kano state.

S/N	Item	N	$Mean(\bar{x})$	SD	Decision
1	Biology concepts are simple; it is only students' poor study habits that make them difficult.	365	2.86	0.87	Agreed
2	I will like to study biology further	365	2.73	0.71	Agreed
3	Biology is subject that deals with my everyday activities, so I like the subject.	365	1.81	0.77	Disagreed
4	I will like to engage in group discussions to ease difficult concepts in Biology	365	2.68	0.84	Agreed
5	Difficult concepts in Biology doesn't discourage me, rather it encourage me to pay more attention.	365	2.64	0.73	Agreed
6	I think interaction can reduce difficulties in teaching Biology concepts.	365	1.76	0.88	Disagreed
7	I wish my biology teachers will involve students actively in practical, this can reduce difficulties in the subject	365	2.55	0.96	Agreed

Benchmark: <2.50 is Disagreed ≥ 2.50 Agreed

Table 3 shows the mean and standard deviation of students' perceptions of difficult concepts in science and technical schools, Kano state. The criteria is that mean below 2.50 is disagreed while 2.50 above is agreed. The options agreed were: Biology concepts are Simple; it is only students' poor study habits that make them difficult, I will like to study biology further, I will like to engage in group discussions to ease difficult concepts in Biology, Difficult concepts in Biology doesn't discourage me, rather it encourage me to pay more attention and I wish my biology teachers will involve students actively in practical, this can reduce difficulties in the subject. The options disagreed are: Biology is subject that deals with my everyday activities, so I like the subject and I think interaction can reduce difficulties in teaching Biology concepts.

Hypothesis One: There is no significant gender difference in the perception of Biology difficult concepts in Science and Technical Schools in Kano State

Table 4:
Independent sample z-test of the mean perception scores of Male and female students Biology students towards difficult concepts in Biology.

Group	N	Mean($\bar{x}$)	SD	DF	p-Value	Decision
Male	248	15.51		363	0.000	Rejected
Female	117	18.04	2.76			

Table 4 shows the perception of male and female students towards difficult concepts in Biology in science and technical schools in Kano state. The result shows that the p-value is 0.000 which is less than the significant p- value 0.05, with df = 363 This hypothesis is rejected. Therefore, there is significant difference between the mean perception scores of male and female biology students towards Biology difficult concepts in science and technical schools, Kano (df=363, p=0.000<0.05). **Hypothesis Three:** There is no significant relationship between the students' perception of difficult concepts in biology and academic achievement

Table 5: PPMCC test between students' perception of difficult concepts in Biology and academic achievement.

		Perception	**Academic Achievement**
Perception	Pearson Correlation	1	-.006
	Sig. (2-tailed)		.913
	N	365	365
Academic Achievement	Pearson Correlation	-.006	1
	Sig. (2-tailed)	.913	
	N	365	365

From table 5, it was found that the P-value observed is 0.006 which is less than level of significant p-value 0.05, the null hypothesis is therefore rejected. This shows that there is significantrelationship between student perception of difficult concepts in Biology and their academic achievement in science and technical schools of Kano state. But the negative sign indicates that the relationship is in the opposite direction, therefore the students' perception has influence in their academic performance which in turn reduces their performance in the subject. (p=- 0.006<0.05).

Discussions

The various results found in this study which were discussed in this section. Based on the findings from this study, it was found that Biology students in science and Technical Secondary Schools of Kano state found some topics difficult which are supporting tissues in plants, excretion, respiratory system, external and internal structure of flowering plants, germination of seeds, tissues and supporting systems in animals, micro- organisms and ecology of population. This is in accordance to the findings of Etobro & Fabinu (2017), Benjamin & Emmanuel (2017) and Cimer (2012), which identified difficult concepts as ecology of population to be difficult; external and internal structure of flowering plants, germination of seeds and the topics: tolerance, adaption and irritability were responded as not difficult. It was also found that there is significant relationship between students' perception of difficult concepts in Biology and their academic achievement in science and technical schools of Kano state. But the relationship is in the opposite direction; therefore the students' perception has influence in their academic performance negatively, which in turn reduce their performance in the subject. This study is in line with the study of Aderemi, Gospel & Femi (2016) who found out that; factors that influence students' academic achievement on

Biology include students' perceptions, socio-economic status, teaching quality and school resources. The finding is also in consonance to that of Igbojinwaekwu & Theresa (2019) and Benjamin & Emmanuel (2017), who found out that students' perception of difficult concepts in Biology has great influence in their academic achievement, this shows that if the students are scared or having negative perception, their academic achievement will be low compared to the a situation where the students may have high positive perception of difficult concepts in Biology, this is so because the result reveals that the students' perception has influence on their academic achievement.

Conclusions

Based on the findings of the study, the following conclusions were drawn.

i. The topics perceived difficult by the students were: supporting tissues in plants, excretion, respiratory system, external and internal structure of flowering plants, germination of seeds, tissues and supporting systems in animals, micro-organisms and ecology of population.

ii. There is significant relationship between students' perception of difficult concepts in Biology and their academic achievement in science and technical schools of Kano state. (Negative relationship) ($p=-0.006<0.05$).

Contributions to Knowledge

The results of this study provided the following contributions to knowledge:

i. There are some concepts in Biology perceived difficult by students, and so measures should be taken to ease those difficulties

ii. The study also established that both genders should be carried along while teaching because there is difference in their perceptions and attitudes.

iii. The study also established that students' perceptions have influence in their academic achievement in Biology.

iv. The study also established that students' perceptions have influence in their attitude towards Biology difficult concept.

Recommendations from the Study

The recommendations from the study are as follows:

i. Biology teachers should try to use teaching strategies that will ease learning of Biology concepts possibly leaners' center methods.

ii. Measures should be taken in order to prevent differences between genders while teaching and learning of Biology.

iii. Students negative perceptions should be improved because it affect their academic performance and attitudes.

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Administrative Environment Components as Predictor to Students' Academic Performance in Secondary Schools in Edo South Senatorial District

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Abstract

This study examined school administrative environment components as predictor to students' academic performance in secondary schools in Edo South Senatorial District. It focused on the effects of administrative components such as communication style, decision-making process, staff supervision, and leadership approach. It also explored whether school characteristics like size, location, and the principal's gender influence this relationship. The research used a descriptive survey design, involving 2,502 teachers and principals across 137 public secondary schools. From this, a sample of 217 participants were randomly selected from 21 schools. Data were collected using a validated questionnaire called the *Nature of School Administrative Environment (SAE)* and a structured performance from NECO results in English, Mathematics, and Civic Education. The SAE instrument was confirmed reliable through the split-half method, yielding a high reliability coefficient of 0.98. Results showed that students' academic performance was generally average, with most students scoring within the credit range. Statistical analysis using independent samples t-test revealed that students in schools with highly effective administrative environments performed significantly better ($M = 78.45$) than those in less effective schools ($M = 72.18$), $p = .001$. Multiple regression analysis indicated a significant joint influence of the four administrative components on student performance ($R^2 = 0.472$, $F = 47.63$, $p < .001$), with leadership approach being the strongest predictor. The study concludes that strengthening administrative practices in schools, especially leadership, communication, and supervision, can improve student academic outcomes. It recommends professional training for school leaders, strategic management of school populations, and gender –sensitigve leadership devepopment programs

Keywords: *school administrative environment*, communication style, decision-making process, staff supervision, and leadership approach

Introduction

The relationship between school administrative environment and academic performance represents a crucial dimension in educational research, particularly in developing countries like Nigeria. Understanding this relationship becomes increasingly important as educational institutions seek to optimize their environments to enhance student outcomes. Recent studies have demonstrated that the administrative environment plays a pivotal role in shaping the learning experiences and academic achievements of students (Ehinola, 2014). Students' academic performance in secondary schools is a major concern for educators, parents, and policymakers in Nigeria. Academic performance refers to how well students achieve their learning goals, usually measured by their grades, examination results, and overall academic achievements (Ajayi, 2019). In Edo South Senatorial District, like many parts of Nigeria, there have been mixed results in student performance, with some schools recording high success rates while others struggle with poor outcomes. Understanding the factors that predict or influence academic performance is essential to improve educational quality and student success.

One important predictor of students' academic performance is school administrative environment. School administration involves the management and organization of school

resources, staff, and activities to create a conducive learning atmosphere (Daramola, 2019). Schools with effective administrative environments tend to have better communication, clear decision-making processes, strong leadership, and proper staff supervision. These components help ensure that teaching and learning processes are well coordinated and that students receive the support they need to excel academically (George, 2015).

Research shows that there is often a significant difference in academic performance between schools with highly effective administrative environments and those with less effective ones. Schools where principals and administrators actively engage in good leadership practices, maintain discipline, and foster positive school-community relations usually see better student outcomes (Ajiboye, 2016). Conversely, schools with poor administrative structures often face challenges such as overcrowding, inadequate facilities, and low staff morale, which negatively affect students' learning and performance (Yahya, 2019).

The components of the school administrative environment that most influence academic performance include communication style, decision-making processes, staff supervision, and leadership approach. Effective communication ensures that teachers, students, and parents are well informed and involved in the school's activities. Inclusive decision- making allows for better problem-solving and ownership of school goals. Proper supervision of staff guarantees that teaching standards are maintained, while leadership approach shapes the school culture and motivation of both staff and students (Unagha, 2018).

Communication style in schools plays a crucial role in creating a supportive academic environment. When school leaders communicate clearly and regularly with teachers and students, misunderstandings are minimized, and everyone works towards common goals. This positive communication has been linked to increased student engagement and better academic results (Mashood, 2022). On the other hand, poor communication can lead to confusion, low morale, and poor student performance.

Decision-making processes also affect how well a school functions. Schools where decisions are made transparently and involve input from teachers, students, and parents tend to have higher levels of trust and cooperation. This collaborative approach helps address academic challenges promptly and effectively, leading to improved student outcomes (Daramola, 2019). Conversely, autocratic decision-making can alienate staff and students, reducing motivation and academic achievement.

Leadership approach is perhaps the most visible component of school administration. Principals who adopt transformational leadership styles—encouraging innovation, motivating staff, and focusing on student welfare—often create positive learning environments that enhance academic performance (George, 2015). In contrast, authoritarian leadership may stifle creativity and reduce teacher effectiveness, negatively impacting students' academic success. Therefore, understanding how these administrative components jointly influence academic performance is critical for improving secondary education in Edo South Senatorial District.

Empirical Studies

Okoro and Eze (2019) investigated the academic performance of secondary school students in Enugu State, Nigeria. Using a descriptive survey design, data were collected from 250 students and 50 teachers through questionnaires and school records. The study found that students' academic performance was generally moderate, with variations linked to teaching quality and learning resources. The authors emphasized the need for improved instructional strategies and resource allocation to enhance student outcomes. However, the study did not focus on the role of school administrative environment components in influencing performance.

Ibrahim and Musa (2020) examined the difference in academic achievement between secondary schools with effective and less effective administrative environments in Kaduna State. Employing a comparative survey design, data were gathered from 200 teachers and principals using structured questionnaires. The findings revealed a significant difference in students' academic performance, with schools exhibiting highly effective administrative environments showing better results. The study highlighted leadership style, staff motivation, and school climate as key factors contributing to this difference. However, the research did not explore how specific administrative components jointly affect academic outcomes.

Chukwu and Nwankwo (2021) studied the combined effect of school administrative components; communication style, decision-making process, staff supervision, and leadership approach on students' academic performance in secondary schools in Anambra State. leadership style, staff motivation, and school climate as key factors contributing to this difference. However, the research did not explore how specific administrative components jointly affect academic outcomes.

Afolabi and Adetunji (2020) investigated the combined effects of school administrative environment factors on academic achievement among secondary school students in Oyo State. Employing a correlational research design, the study sampled 150 teachers and 300 students. Data were analyzed using hierarchical regression techniques. Results revealed that communication style, participative decision-making, effective supervision, and transformational leadership jointly predicted a significant proportion of the variance in students' academic performance.

Statement of the Problem

Despite efforts to improve education in Edo South Senatorial District, many secondary schools continue to report poor student academic performance. According to recent reports, a significant number of students fail to meet the minimum requirements in key subjects such as Mathematics, English, and Science. This poor performance has raised concerns among educators and parents about the effectiveness of school administration and the learning environment provided to students. Observations in several schools within the district reveal that many principals struggle with administrative challenges such as inadequate communication, weak decision-making, poor staff supervision, and ineffective leadership styles. These issues often result in low teacher motivation, poor discipline, and insufficient academic support for students.

Observations in several schools within the district reveal that many principals struggle with administrative challenges such as inadequate communication, weak decision-making, poor staff supervision, and ineffective leadership styles. These issues often result in low teacher motivation, poor discipline, and insufficient academic support for students. Previous studies such as Unagha, (2018) and Yahya, (2019), have not fully explored how these specific components of school administration predict student academic outcomes in the local context of Edo South Senatorial District, creating a gap in knowledge.

Therefore, this study seeks to investigate the influence of school administrative components communication style, decision-making process, staff supervision, and leadership approach on students' academic performance in secondary schools in Edo South Senatorial District. The findings will provide valuable insights for school administrators, policymakers, and educators to enhance administrative effectiveness and improve student learning outcomes in the region.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of students' academic performance in secondary schools in Edo South senatorial district?
2. **Is there any** significant difference in students' academic performance between schools with highly effective administrative environments and those with less effective administrative environments?
3. **Is there any** joint significant influence of school administrative environment components (communication style, decision-making process, staff supervision, and leadership approach) on students' academic performance in secondary schools in Edo South Senatorial District?

Hypotheses

These following hypotheses were formulated for this study:

H_o1: There is no significant difference in students' academic performance between schools with highly effective administrative environments and those with less effective administrative environments.

H_o2: There is no joint significant influence of school administrative environment components (e.g., communication style, decision-making process, staff supervision, and leadership approach) on students' academic performance in secondary schools in Edo South Senatorial District.

Methodology

This research adopted a descriptive survey design, which was appropriate because it enabled the researcher to provide a clear and detailed account of the current status of the variables under investigation within real school settings. The approach focused on gathering data that describe and interpret the existing conditions by sampling a representative segment of the entire population.

The study population comprised all 2,502 teachers and principals working in senior secondary schools within Edo South Senatorial District. This data was sourced from the Edo State Ministry of Education located in Benin City. The schools were distributed across seven LGAs: Egor,Ikpoba-Okha,Oredo, Orhionmwon, Ovia North-East, Ovia South-West, and Uhunmwode.

From the total of 137 public secondary schools in the district, 21 schools were selected through random sampling. The sample included 217 teachers and principals. Students' academic results in Mathematics, English, and Civic Education were collected using a structured proforma, as these subjects are compulsory and commonly taught across all secondary schools in both urban and rural locations. The relatively small number of teachers in rural schools influenced the choice of this sampling method.

Data collection was carried out using two primary instruments: a questionnaire and a proforma for recording students' examination results. The questionnaire, titled "Nature of School Administrative Environment (SAE)," was divided into two sections. Section A gathered demographic information such as gender, school location, and school size. Section B consisted of 22 structured items related to the school administrative environment, measured on a 4-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The proforma was utilized to collect NECO examination scores, which were obtained from school principals upon request.

To establish validity, the questionnaire was reviewed by two experts from the Faculty of Arts and Education at Benson Idahosa University, Benin City. Their constructive feedback was used to refine and improve the instrument's quality and relevance. Reliability was tested using the split-half method, where 20 teachers not involved in the main study completed the questionnaire twice over a two-day interval. Analysis of their responses yielded a high correlation coefficient of 0.98, indicating excellent reliability and consistency. A total of 250 questionnaires were distributed among teachers and principals in the selected schools. Of these, 217 were duly completed and returned. The distribution and collection of the questionnaires were conducted by the researcher and two trained research assistants, following approval from the relevant school authorities. This process spanned two weeks. The collected data were subsequently analyzed, with research questions 1 using mean scores, while hypotheses 1 - 2 were analyzed using Independent Samples t-test and Multiple Regression Analysis.

Results

Answers to the Research Question Research Question One: What is the level of student's academic performance in secondary schools in Edo South Senatorial District of Edo State?

Table 1: Descriptive statistics showing the level of student's academic performance in secondary schools in South senatorial District of Edo State

		w	SUBJECT			Total	Weighted Freq.	Mean	Decision
			English Language	Mathematics	Civic Education				
Grade	F9	0	19	32	20	71	0		
	E8	1	35	38	23	96	96		
	D7	2	97	117	57	271	542		
	C6	3	289	286	243	818	2454		Average
	C5	3	141	201	242	584	1752	2.83	Performance
	C4	3	75	162	140	377	1131		
	B3	4	14	119	103	236	944		
	B2	4	10	5	4	19	76		
	A1	5	2	1	0	3	15		
			682	**961**	**832**	**2.475**	**7010**		

The analysis in Table 1 shows that the academic performance of students in secondary schools across Edo South Senatorial District is generally at an average level. Out of a total of 2,476 students, only a small percentage performed poorly, with 2.9% scoring F9 and 3.9% scoring E8. A moderate percentage (10.9%) scored D7, indicating a low pass. The majority of students scored within the credit range, with 33.0% obtaining C6, 23.6% obtaining C5, and 15.2% obtaining C4. A smaller portion of the students achieved higher grades, with 9.6% scoring B3, 0.8% scoring B2, and only 0.1% scoring A1. These results suggest that while a few students performed excellently or poorly, most students achieved average grades, indicating that the overall academic performance in the district is average.

Test of Hypotheses

Hypothesis One: There is no significant difference in students' academic performance between schools with highly effective administrative environments and those with less effective administrative environments.

Table 2: Independent Samples t-test on significant difference in students' academic performance between schools with highly effective administrative environments

Administrative Environment	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Highly Effective	108	78.45	12.34	1.19
Less Effective	109	72.18	14.67	1.41

	Levene's Test for Equality of Variances	**t-test for Equality of Means**
	F	Sig.
Equal variances assumed	2.134	.146
Equal variances not assumed		

The independent samples t-test revealed a statistically significant difference in academic performance between schools with highly effective administrative environments (M = 78.45, SD = 12.34) and those with less effective administrative environments (M = 72.18, SD = 14.67), t (215) = 3.42, p = .001. The mean difference was 6.27 points, with a 95% confidence interval ranging from 2.66 to 9.88. Therefore, we reject the null hypothesis $H_0 1$ and conclude that there is a significant difference in students' academic performance between schools with highly effective and less effective administrative environments, with students in highly Effective environments performing significantly better.

Hypothesis Two: There is no joint significant influence of school administrative environment components (e.g., communication style, decision- making process, staff supervision, and leadership approach) on students' academic performance in secondary schools in Edo South Senatorial District.

Table 3: Multiple Regression Analysis on joint significant influence of school administrative environment components on students' academic performance in secondary schools

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.687	.472	.462	10.83

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22,345.67	4	5,586.42	47.63	.000
	Residual	24,864.33	212	117.28		
	Total	47,210.00	216			

Coefficients

Model		Unstandardized Coefficients	Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	
1	(Constant)	23.45	4.67		5.02
	Communication Style	8.32	1.89	.254	4.40
	Decision-Making Process	6.78	1.65	.231	4.11
	Staff Supervision	5.94	1.72	.198	3.45
	Leadership Approach	7.15	1.58	.267	4.53

The multiple regression analysis revealed that four administrative environment components (communication style, decision-making process, staff supervision, and leadership approach) jointly have a statistically significant influence on students' academic performance, $F(4, 212) = 47.63$, $p < .001$. The model explains 47.2% of variance in academic performance ($R^2=.472$). All four components were significant predictors: communication style ($\beta = .254$, $p < .001$), decision-making process ($\beta = .231$, $p < .001$), staff supervision ($\beta = .198$, $p = .001$), and leadership approach ($\beta = .267$, $p< .001$). Therefore, we reject the null hypothesis H_o2 and conclude that there is a joint significant influence of school administrative environment components on students' academic performance in secondary schools. Leadership approach showed the strongest relationship with academic performance, followed by communication style, decision-making process, and staff supervision.

Discussion of Findings

The result from research question one revealed that students' academic performance in the district is generally **average**. Most students scored within the credit range, particularly C6 (33%), C5 (23.6%), and C4 (15.2%). Only a few students had excellent grades (A1 – 0.1%, B2 – 0.8%, B3 – 9.6%) while very few had poor results (F9 – 2.9%, E8 – 3.9%). This shows a middle-ground trend in academic achievement, suggesting that while few students are excelling, the majority are performing moderately. This outcome supports the study of **Okoro and Eze (2019)**, who found that students in Enugu State also performed moderately, with academic outcomes affected by teaching quality and the availability of learning resources.

The result from **hypothesis** one showed a **significant difference** in students' academic performance between schools with **highly effective administrative environments** and those with **less effective ones**. Students in schools with better administrative environments had a **mean score of 78.45**, while those in less effective settings had **72.18**, and this difference was statistically significant ($p = .001$). This aligns strongly with the findings of **Ibrahim and Musa (2020)**, who reported that students in schools with better leadership and administrative practices in Kaduna State performed significantly better. Their study identified factors such as leadership style and school climate as major contributors to performance differences, which is consistent with the current findings. The result from **hypothesis** two showed a statistically significant ($F = 47.63$, $p < .001$), and it accounted for **47.2%** of the variance in students' academic performance. This is a notable proportion, indicating that nearly half of what determines students' performance can be explained by these four administrative factors. Among the predictors, **leadership approach** ($\beta = .267$) showed the strongest influence, followed by **communication style** ($\beta = .254$), **decision-making process** ($\beta = .231$), and **staff supervision** ($\beta = .198$). These findings reinforce the idea that school leadership and administrative practices play a central role in shaping the academic outcomes of students. This result confirms the conclusions of **Chukwu and Nwankwo (2021)**, who also found a significant combined influence of similar administrative components on students' performance in Anambra State. Their study emphasized the value of inclusive communication and participatory decision- making, which the present study also supports. Similarly, the

current findings are in agreement with **Afolabi and Adetunji (2020)**, whose study in Oyo State reported that administrative factors such as participatory decision-making, effective supervision, and transformational leadership significantly predicted academic performance.

Conclusion

The study showed that most students in the district perform at an average level, with very few achieving excellent or poor results. Schools with strong and effective administrative environments had students who performed better academically. The research also revealed that school leadership, communication, decision-making, and supervision all play important roles in improving students' academic performance. These results confirm earlier studies from different parts of Nigeria, showing that good administration in schools has a positive impact on students' success.

Recommendations

Based on the findings of the study, it was recommended that:

1. School principals and administrators should be trained to adopt strong, supportive, and transformational leadership styles to help improve student performance.
2. Schools should promote open and inclusive communication between administrators, teachers, and students to ensure that everyone is well-informed and involved in school activities.
3. School leaders should involve teachers and staff in the decision-making process. This will create a more united team working toward student success.
4. Regular and constructive supervision of teaching staff should be encouraged to maintain teaching quality and help teachers grow professionally.

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Remedial Education: An Inclusive Intervention Strategy for Primary School Pupils with Hearing Impairment in Nigeria

By

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Abstract

Remedial education addresses foundational learning deficiencies by re-teaching basic academic skills such as literacy and numeracy. This instructional method is particularly crucial for learners with disabilities, including pupils with hearing impairment who often face additional barriers in accessing quality education. In Nigeria, the need for structured remedial programmes tailored to the needs of such learners is increasingly evident. This paper examines the rationale, planning, and implementation of remedial instruction, with a focus on pupils with hearing impairment in primary schools. Key strategies such as individualized teaching, diagnostic assessment, and inclusive practices are explored. The study concludes with practical recommendations for enhancing remedial education policies and teacher preparation programmes

Keywords: *Remedial Education*, Hearing Impairment, Inclusive Teaching, Rehabilitation, Primary Education

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Introduction

Remedial education refers to specialized instructional approaches designed to address foundational learning gaps and support learners who lag behind academic expectations. It aims to reinforce core academic skills such as reading, writing, and mathematics, enabling students to meet expected learning outcomes (Abraham, 2019). For pupils with hearing impairment, who often face additional barriers in accessing quality education, remedial education can serve as a bridge toward academic inclusion and achievement. According to the Individuals with Disabilities Education Act (IDEA, 2004), pupils with hearing impairment are entitled to specialized services that support their learning. These services include early identification of hearing loss, communication supports such as sign language interpreters, listening accommodations, classroom modifications, and teacher consultation. Educators also collaborate with audiologists and other specialists to ensure the learning environment supports auditory access and engagement (Zimmerman, 2003). In Nigeria, many students with hearing impairment in primary schools face challenges related to late identification, lack of communication aids, and inadequate teacher training. Despite global progress in inclusive education practices, there remains a significant gap in targeted remedial support for these learners. UNESCO (2021) noted that 40% to 60% of first-year college students globally require remedial education, often due to foundational deficiencies in literacy and numeracy

This suggests the importance of early intervention, especially for children with disabilities. This study examines remedial education as a viable intervention strategy for rehabilitating and reintegrating pupils with hearing impairment into the mainstream learning environment. It highlights planning, instructional strategies, and diagnostic assessment as essential tools for effective intervention. The goal is to offer recommendations that will inform educational policy, teacher training, and classroom practices in inclusive primary education in Nigeria. Hearing Impairment: Global and National Perspectives

Hearing impairment is a significant global public health and educational concern. According to the World Health Organization (WHO, 2021), more than 430 million people over 5% of the world's population experience disabling hearing loss, and this figure is projected to rise to over 700 million by 2050. The implications of hearing loss extend beyond health to educational access, especially in low- and middle-income countries where early detection and intervention services are limited. In Nigeria, hearing impairment remains highly prevalent among children. The National Centre for Prevention of Deafness and Rehabilitation of Hearing Impaired Persons (NCPDRHIP, 2016) estimated that over 12 million Nigerians live with hearing disabilities, with approximately 3.5 million being children under the age of 15. This aligns with findings from the National Survey of Hearing Impairment and Deafness (NSHID, 2019), which highlights a growing burden of childhood hearing loss, largely due to untreated infections, inadequate screening programmes, and limited access to auditory healthcare.

Regional studies also reveal alarming trends. For instance, a survey conducted in Ogbomoso, South-West Nigeria, reported that approximately 52.4% of children in nursery schools showed symptoms of hearing problems, often related to middle ear diseases or cerumen auris (Adebola, 2013). Similarly, Olayinka (2007) documented that nearly half of pupils assessed in selected schools in South-West Nigeria exhibited varying degrees of hearing loss, with 82% presenting with conductive hearing loss and 18% with sensorineural impairment. The educational impact of hearing impairment is profound. Children with hearing loss often struggle with language development, communication, and academic achievement, particularly in inclusive settings where individualized support is limited (Muriithi, 2011). Without early diagnosis and targeted instructional strategies, these learners are at risk of falling behind their peers. This underscores the urgent need for comprehensive remedial programmes that address not only the academic but also the communicative and social needs of hearing-impaired pupils within the school system.

Rehabilitation and Educational Inclusion for Pupils with Hearing Impairment

Rehabilitation, in the context of education, refers to structured interventions aimed at restoring or enhancing the functional and academic capabilities of learners who face barriers to effective learning. For pupils with hearing impairment, educational rehabilitation entails more than medical support it involves deliberate instructional, communicative, and psychosocial interventions that enable their full participation in schooling. According to the World Health Organization (WHO, 2021), rehabilitation includes a set of measures that assist individuals experiencing or likely to experience disability to achieve and maintain optimal functioning in interaction with their environment.

learners who face barriers to effective learning. For pupils with hearing impairment, educational rehabilitation entails more than medical support it involves deliberate instructional, communicative, and psychosocial interventions that enable their full participation in schooling. According to the World Health Organization (WHO, 2021), rehabilitation includes a set of measures that assist individuals experiencing or likely to experience disability to achieve and maintain optimal functioning in interaction with their environment. In the case of children with hearing loss, rehabilitation supports may include speech and language therapy, the use of hearing aids or cochlear implants, auditory training, and tailored classroom instruction.

Rehabilitation in education also involves re-integrating pupils who have fallen behind academically, due to unaddressed communication barriers, into regular classroom learning. This requires collaboration between special educators, audiologists, speech-language therapists, and mainstream teachers to implement individualized education plans (IEPs). These professionals help children develop listening, speaking, reading, and writing skills needed for academic success (Bradley, 2018). In inclusive settings, the goal of rehabilitation is to promote equity and participation. WHO Europe (2022) emphasizes that rehabilitation must be embedded within inclusive service delivery frameworks, allowing individuals with disabilities equal opportunities for learning, employment, and community engagement. For pupils with hearing impairment, effective educational rehabilitation must also address self-esteem, peer interaction, and classroom communication to prevent further marginalization.

Thus, rehabilitation is not just a support mechanism it is a core strategy for achieving inclusive education. When integrated within a remedial education framework, rehabilitation can play a transformative role in restoring lost academic opportunities and ensuring long- term learning success for pupils with hearing impairment.

Rationale for Remedial Education in Inclusive Learning for Hearing- Impaired Pupils

Remedial education plays a crucial role in bridging academic gaps for learners who, for various reasons, have fallen behind expected learning milestones. For pupils with hearing impairment, who often face delays in language acquisition, limited auditory exposure, and inadequate instructional adaptations, remedial education becomes both a corrective and empowering tool. The National Association for Developmental Education (NADE, 2018) highlights that remedial education fosters mastery of foundational skills, enhances learners' confidence, and promotes differentiated instruction based on individual needs. These aims align closely with inclusive education objectives as outlined in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006), which mandates the right of learners with disabilities to inclusive, quality, and equitable education at all levels. In African contexts, several countries have recognized the importance of remedial education within inclusive frameworks. For example, South Africa's *White Paper 6 on Special Needs Education* advocates for early intervention programmes and remedial support to address learning backlogs in children with disabilities (Department of Education, South Africa, 2001).

In African contexts, several countries have recognized the importance of remedial education within inclusive frameworks. For example, South Africa's *White Paper 6 on Special Needs Education* advocates for early intervention programmes and remedial support to address learning backlogs in children with disabilities (Department of Education, South Africa, 2001). Similarly, Kenya's Basic Education Act (2013) mandates the provision of individualized support services to learners with disabilities within mainstream schools. In Nigeria, where access to inclusive schooling remains uneven and specialist services are limited in many public schools, remedial education represents an affordable and scalable strategy to support hearing-impaired pupils. It allows teachers to target specific skill deficits, such as phonemic awareness, vocabulary development, or numerical reasoning, using customized materials and multisensory techniques (Abraham, 2019). More importantly, it ensures that no child is left behind due to circumstances beyond their control.

Remedial education therefore contributes not only to improved academic performance but also to broader goals of equity, participation, and lifelong learning. In a truly inclusive system, remedial teaching should not be viewed as a remedial "label," but rather as a flexible tool to help all learners thrive.

Diagnosis of Learning Challenges among Pupils with Hearing Impairment

Effective remedial instruction begins with accurate and systematic diagnosis of learners' academic challenges. Diagnosis in education involves identifying specific learning difficulties that hinder progress, such as gaps in reading comprehension, mathematical reasoning, or expressive language skills. For pupils with hearing impairment, this process requires careful consideration of both cognitive and communicative factors. Zimmerman (2003) emphasized that no new learning can occur until previous misconceptions or skill deficits are identified and addressed. Diagnostic assessment goes beyond testing deficits, such as phonemic awareness, vocabulary development, or numerical reasoning, using customized materials and multisensory techniques (Abraham, 2019). More importantly, it ensures that no child is left behind due to circumstances beyond their control.

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For academic knowledge; it evaluates learners' strengths, weaknesses, sensory access, and preferred learning modalities. In the context of hearing impairment, this may involve assessing auditory processing, sign language proficiency, phonological awareness, and written language output.

Teachers can employ multiple tools to diagnose learning challenges, including:

- **Pre-assessment quizzes** to identify prior knowledge and misconceptions.
- **Observation checklists** for classroom behavior and participation.
- **Language and literacy screenings** tailored to the pupil's communication mode.
- **Parent interviews and audiologist reports**, which provide background on hearing history and device use.
- **Portfolio assessments** showing students'

ongoing work samples and progress.

According to Muriithi (2011), learners with hearing impairment should not only be assessed academically but also socially and communicatively, to uncover hidden barriers that affect their performance. The use of Individualized Education Plans (IEPs) can support this process by outlining measurable goals, support services, and accommodations specific to each child's needs. Current inclusive practices emphasize **diagnostic teaching** a dynamic, feedback-driven approach where teachers continuously adapt instruction based on pupils' learning responses. This includes analyzing errors after tests or tasks, identifying patterns of misunderstanding, and applying corrective strategies such as differentiated instruction, peer tutoring, or graphic organizers (Bradley, 2018). In all, a strong diagnostic foundation ensures that remedial strategies are relevant, personalized, and effective. For hearing-impaired pupils in Nigerian schools, where formal special needs screening may be lacking, empowering teachers to apply classroom-based diagnostic tools is critical to early intervention.

Planning and Implementation of Remedial Instruction for Pupils with Hearing Impairment

Effective remedial education requires meticulous planning and strategic implementation tailored to the unique needs of each learner. For pupils with hearing impairment, the planing phase begins immediately after diagnostic assessment, where teachers identify areas of need and develop individualized strategies to address specific deficits in communication, language, literacy, or numeracy.

According to Maheady and Gard (2010), the remedial planning cycle includes the following critical stages:

Diagnosis – identification of the learning gap.

1. **Planning** – setting specific, measurable learning goals.
2. **Instruction** – applying targeted teaching methods.
3. **Feedback and Correction** – reinforcing concepts and addressing errors.
4. **Evaluation** – measuring progress and modifying instruction.

This continuous loop allows educators to adjust their methods based on learner feedback, ensuring a responsive and personalized instructional experience. For pupils with hearing impairment, the implementation of remedial instruction must incorporate inclusive communication strategies. These include the use of:

- **Visual aids**, such as charts, images, and sign language videos.
- **Multisensory techniques**, combining touch, sight, and movement.
- **Collaborative activities**, encouraging peer support.
- **Assistive technology**, such as captioned videos, hearing aids, and speech-to-text tools.

Implementation also requires environmental considerations ensuring proper seating arrangements for optimal visual access, minimizing background dnoise, and establishing visual cues for classroom routines. Teachers must also collaborate with other professionals such as special educators, sign language interpreters, and speech therapists to implement individual learning plans effectively (Williamson, 2018).

Planning should also be culturally and contextually relevant. In low-resource Nigerian classrooms where hearing screening tools and assistive devices may be lacking, teachers can use **adapted remedial strategies** such as simplified texts, task repetition, and small-group instruction to address learning gaps (Abraham, 2019). Ultimately, remedial instruction is most successful when it is continuous, child- centered, and flexible. Teachers should document progress through daily records, informal tests, and student portfolios, while involving parents in regular feedback loops to reinforce learning at home.

Types of Remedial Education and Their Applicability to Pupils with Hearing Impairment

Remedial education involves targeted instructional strategies designed to help learners overcome specific academic challenges. These strategies vary in structure and delivery, allowing educators to select approaches that best suit learners' profiles, classroom contexts, and available resources. For pupils with hearing impairment, remedial approaches must account for communication barriers, delayed language development, and diverse learning preferences. The following are key types of remedial education with their specific applications to learners with hearing impairment:

1. Small Group Tutoring

This method involves instructing a few pupils at a time, allowing for peer interaction, more feedback, and a quieter environment. For hearing-impaired pupils, small groups can be especially beneficial as teachers can monitor lip-reading, provide visual aids, and use sign language without distraction (Hoxby, 2000).

2.One-on-One Instruction

Individual tutoring allows for fully customized instruction and close monitoring of learner progress. It is ideal for addressing unique language gaps or communication preferences (oral, signed, or bilingual) in hearing-impaired children. Teachers can also adjust pace, reinforce concepts visually, and immediately correct misconceptions (Zimmerman, 2003).

3. Peer Tutoring

This involves pairing a pupil with a more advanced peer to provide guidance and support. Peer tutors can model communication strategies, offer encouragement, and reinforce content. With proper training, peers can learn to use gestures or basic signs to support hearing- impaired classmates, fostering social inclusion

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6. Specialist Tutoring

Special educators or speech- language therapists may deliver remediation focusing on literacy, auditory processing, or speech clarity.

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8. Specialist Tutoring

Special educators or speech- language therapists may deliver remediation focusing on literacy, auditory processing, or speech clarity. Although not widely available in Nigerian public schools, mobile specialist services NGO supported initiatives have shown success in urban areas.

9. Computer-Assisted Remediation (CAI)

Technology-enhanced learning, including captioned videos, sign-language apps, speech-to-text tools, and visual learning platforms, supports individualized and accessible remediation. While cost may be a barrier, low-cost tablets and offline applications can be adopted in resource- limited Nigerian settings (Berdahl, 2022).

10. Withdrawal Remediation Systems

In this model, pupils are temporarily withdrawn from the mainstream classroom for focused remediation. While controversial in fully inclusive settings, short-term withdrawal can be effective if reintegration plans and communication supports are maintained.

11. Volunteer or NGO Tutoring

Community-based organizations can provide extra support through trained volunteers, particularly in underserved areas. These partnerships often fill gaps where schools lack the resources to deliver specialized interventions. Each of these methods has potential benefits when applied thoughtfully, with consideration of the learner's hearing level, preferred mode of communication, and social-emotional needs. For maximum effectiveness, remedial educators must ensure that strategies used are multisensory, culturally appropriate, and consistent with inclusive education principles. with hearing impairment in inclusive and remedial settings:

The 3Ds Approach: Directing, Discussing, and Delegating

This instructional model promotes cognitive engagement through layered learning styles (IHSD, 2022).

- **Directing**: Involves clear instructions using visual cues or sign language to promote attention and comprehension.
- **Discussing**: Facilitates learning through small group conversations and peer collaboration, supported by interpreters or gesture-based communication.
- **Delegating**: Builds learner autonomy by assigning practical tasks that develop confidence and reinforce previously taught content.

Remedial Instructional Strategies for Supporting Pupils with Hearing Impairment

Remedial instruction for pupils with hearing impairment must go beyond content delivery it must be adaptive, multisensory, and rooted in inclusive teaching principles. The effectiveness of any remedial strategy depends on how well it addresses the unique communication, cognitive, and emotional needs of the learner. The following are evidence-based strategies particularly relevant for learners with hearing impairment in inclusive and remedial settings:

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2. Multisensory Instruction

Pupils with hearing impairment benefit from instructional approaches that integrate visual, tactile, and kinesthetic elements. Techniques include using manipulatives in math, finger spelling, flashcards, color-coded texts, and real-life demonstrations. Multisensory teaching has been found to improve retention, engagement, and decoding skills in early readers (Berdahl, 2022).

3. Analytic Teaching Approach

This strategy involves tracking student progress through continuous assessment and giving constructive feedback based on observable performance. Teachers analyze common errors and adjust instruction accordingly (Lynch, 2019). Analytic methods empower hearing- impaired pupils by making progress visible, measurable, and affirming

5. **Drill Sandwich Strategy (Hamburger Method)**

This memorization technique structures practice around a mix of familiar (known) and new (unknown) items, promoting memory retention and confidence. For hearing-impaired learners, visual flashcards, sign-word pairings, and word-picture matches are used in drills (Mountcastle, 2021). The predictable structure reduces cognitive load while building mastery incrementally.

6. **Individualized Instruction**

No two pupils with hearing impairment learn the same way. Individualized Education Plans (IEPs) help teachers tailor instruction to the learner's communication mode (oral, signed, bilingual), proficiency level, and academic history. These plans also specify accommodations like preferential seating, visual alerts, or sign-supported speech (Williamson, 2018).

7. **Technology-Enhanced Support**

When available, captioned videos, interactive sign language apps, and speech-to-text tools allow for self-paced learning and vocabulary acquisition. In Nigeria, some NGOs have piloted low-cost devices in inclusive classrooms, bridging the gap between mainstream instruction and specialized needs. These instructional approaches emphasize **inclusivity, flexibility, and responsiveness**, which are fundamental for remedial success. When properly implemented, they not only enhance academic outcomes but also contribute to the social-emotional development of pupils with hearing impairment, promoting confidence, independence, and belonging.

Understanding and Addressing Individual Differences in Remedial Education for Hearing-Impaired Pupils

Individual differences refer to the distinct traits, characteristics, and learning needs that each pupil brings to the classroom. These differences may arise from variations in age, gender, intelligence, learning style, motivation, prior knowledge, socio-cultural background, and, importantly, the presence of a disability such as hearing impairment (Diaz, 2022; Williamson, 2018). In inclusive classrooms, recognizing and responding to individual differences is essential for effective remedial instruction. Pupils with hearing impairment are not a homogeneous group. Some may have residual hearing; others may be profoundly deaf. Some use spoken language, others use sign language or a combination of both. Some may have additional disabilities. These differences impact how they access content, interact with peers, and respond to interventions. Mooris (2023) noted that understanding individual psychological and cognitive profiles helps teachers to design personalized interventions that align with each learner's strengths. For instance:

- A pupil with strong visual learning preferences may benefit from graphic organizers, charts, and videos with captions.
- Another pupil who is kinesthetic may learn better through hands-on tasks or sign-supported action songs.
- Pupils with high self-efficacy may thrive with independent learning tasks, while others may need frequent reinforcement.

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- Pupils with high self-efficacy may thrive with independent learning tasks, while others may need frequent reinforcement.

Remedial educators must, therefore, differentiate instruction by adjusting content, process, and assessment methods based on learner profiles. This is consistent with **Universal Design for Learning (UDL)**, a framework that promotes flexible teaching methods to accommodate diverse learners from the outset (UNESCO, 2020). In Nigeria's context, this is particularly important because classrooms are often large and under-resourced. Teachers may not have access to psychologists or individualized testing services. However, through continuous observation, informal assessments, and communication with families, teachers can still identify learner preferences and challenges, and adapt their instructional practices accordingly (Shyama, 2023).

Understanding individual differences ensures that no pupil is held to a rigid standard but is instead supported to reach their full potential using methods that work for them. For pupils with hearing impairment, this approach is central to overcoming the systemic barriers that often hinder their educational progress.

Evaluating Remedial Instruction for Pupils with Hearing Impairment

Evaluation is a critical component of remedial education. It allows educators to determine whether instructional strategies are effective, identify areas requiring adjustment, and measure learner progress over time. For pupils with hearing impairment, evaluation must be inclusive, individualized, and sensitive to their communication needs.

There are two main types of evaluation in remedial education:

- **Formative Evaluation**: Ongoing assessments conducted during the learning process to inform teaching decisions. Examples include teacher observations, in-class quizzes, and feedback from peers. For hearing- impaired pupils, visual cues, flashcard games, and performance-based assessments are effective tools in formative evaluation (Bradley, 2018).

Summative Evaluation: Occurs at the end of an instructional unit or intervention cycle to assess overall achievement. This may include standardized tests, portfolio reviews, or oral performance assessments (with necessary accommodations like sign language interpreters or written alternatives).

Abraham (2019) recommends the **each-Test-Teach** approach, where instruction is followed by assessment, and then teaching is adjusted based on observed outcomes. For pupils with hearing impairment, this cycle ensures continuous feedback and responsiveness to their evolving learning profile.

Pre-diagnostic and post-diagnostic assessments are also essential in measuring the effectiveness of remedial interventions. Pre-diagnostic tests establish the learner's starting point, while post-diagnostic tests help to evaluate gains made after targeted instruction. These assessments can be formal (e.g., literacy screening tools) or informal (e.g., comparison of writing samples before and after an intervention). Parental involvement in evaluation is vital, particularly for children with hearing impairment. Parents can provide insights into the child's learning behavior at home, communication preferences, and response to support strategies. Regular parent- teacher meetings and progress reports contribute to a collaborative evaluation framework (UNESCO, 2020).

Lastly, evaluation methods must respect learners' dignity and avoid practices that stigmatize or label them as "deficient." The goal is not only to assess academic progress but also to enhance self- confidence and ensure that each learner's potential is maximized through inclusive, supportive instruction.

Conclusion

Remedial education represents a powerful tool for supporting primary school pupils with hearing impairment in Nigeria and across other low- and middle-income countries. When planned effectively and implemented with inclusive strategies, remedial teaching helps bridge academic gaps, enhance communication, and restore the educational trajectory of pupils at risk of

marginalization. This paper has explored the components of a successful remedial framework, including needs diagnosis, individualized instruction, inclusive strategies such as multisensory teaching and the 3Ds approach, and the importance of structured evaluation. These interventions when adapted to the unique communication and cognitive needs of learners with hearing impairment can transform educational outcomes and promote inclusive participation in mainstream schooling.

As Nigeria and other African nations move toward achieving the Sustainable Development Goals (SDG 4), remedial education must be positioned as a right-based intervention that upholds equity, inclusion, and academic justice. Integrating remedial instruction into mainstream teacher training and national education policies will be critical to ensuring that learners with hearing impairment are not left behind.

Recommendations

Based on the findings and arguments presented, the following recommendations are offered:

1. **Integrate remedial education training into teacher education programmes** to equip pre-service and in-service teachers with the skills required to support learners with hearing impairment.
2. **Adopt flexible, multisensory, and individualized teaching strategies** that address the specific communication needs of pupils with hearing loss.
3. **Revise the national primary school curriculum** to include provisions for inclusive remedial instruction, with a focus on low-resource classroom adaptations.
4. **Integrate remedial education training into teacher education programmes** to equip pre-service and in-service teachers with the skills required to support learners with hearing impairment.
5. **Adopt flexible, multisensory, and individualized teaching strategies** that address the specific communication needs of pupils with hearing loss.
6. **Revise the national primary school curriculum** to include provisions for inclusive remedial instruction, with a focus on low-resource classroom adaptations.
7. **Encourage classroom-based action research** to enable teachers to evaluate the effectiveness of remedial strategies in real time and develop context- specific innovations.
8. **Promote collaboration between general educators, special educators, audiologists, and families** to create a coordinated support system for learners with hearing impairment.
9. **Ensure policy alignment with international frameworks** such as the UN Convention on the Rights of Persons with Disabilities (UNCRPD) and Sustainable Development Goals (SDG 4), which emphasize inclusive and equitable quality education.

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Community Based Rehabilitation Activities and Promotion of Inclusive Participation of People with Special Needs in Rogo Local Government Area, Kano State

By

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Abstract

This study investigated Community-Based Rehabilitation (CBR) activities and the promotion of inclusive participation of persons with special needs in Rogo Local Government Area (L.G.A.), Kano State. The objectives were to identify CBR activities, examine the roles of community caregivers, assess the level of participation of persons with special needs, and determine the challenges faced in implementing CBR initiatives. A survey research design was adopted, with a population of 2,959 persons with special needs, including 50 caregivers. A sample of 370 respondents was proportionately selected. Data were collected using a self- developed structured questionnaire on a four-point Likert scale, with a reliability index of 0.89, and analyzed using frequency counts and percentages. The findings revealed that CBR activities in Rogo L.G.A. include awareness creation, advocacy, sensitization, dialogue, networking, integration, participation, rights promotion, and empowerment in education, health, skills acquisition, and employment. However, challenges identified include inadequate funding, lack of sustainability, insufficient government commitment, poor understanding of CBR concepts, limited acceptance and recognition, lack of reliable data, and inadequate training of caregivers. The study recommends that Rogo L.G.A. strengthen collaboration with community-based organizations, foundations, and faith-based groups to promote welfare and rights for persons with special needs. It also suggests conducting a reliable census of destitute persons, implementing disability laws, and prioritizing social protection programs to enhance inclusion and reduce poverty

Introduction

Much has been written about how some societies or communities treat people with special needs, particularly in how they interact with them at various community levels—such as the family, hamlet, ward, and larger social groups. These attitudes usually reflect cultural beliefs, traditional myths, and misconceptions held by people about individuals with special needs, such as those who are deaf, blind, aged, orphaned, crippled, or amputees, whether they were born in the community or later became residents (Heyward, 2000). History has shown that the survival and advancement of the human race depend not only on the various abilities of individuals but also on the collective efforts of members of society, particularly in Rogo Local Government Area, Kano State. In the past, the Rogo community exhibited attitudes of neglect toward people with special needs, such as the elderly, the weak, the destitute, and individuals with physical deformities or impairments (e.g., the blind, deaf, crippled, or armless). This neglect stemmed from myths or harmful cultural values and beliefs, which led people to view persons with disabilities as liabilities or dependents who could not contribute to the productive process. As a result, such individuals were often dehumanized, neglected, disowned, or even left to die in isolation (Avery, 1981). The World Disability Report estimates that there are over one billion people living with disabilities globally, of whom between 110–190 million experience very significant disabilities (WHO, 2011). It is widely reported that persons with special needs are mostly excluded from education, health care, employment, and other aspects of society. This exclusion can potentially lead to or exacerbate poverty (WHO, 2011).

Community-based rehabilitation (CBR) has emerged as a philosophy aimed at empowering, mainstreaming, strengthening, facilitating, and promoting all developmental aspects that can improve the living standards and well-being of persons with special needs through the involvement of all community caregivers, including disabled people's organizations. The World Health Organization (WHO) adopted Resolution 58.23, urging member states—including Nigeria, Kano State, and Rogo Local Government Area—to promote, strengthen, and facilitate CBR programs and activities. Currently, community-basedrehabilitation is implemented in about 90 countries worldwide, including Kano State and Rogo Local Government Area, for the betterment of persons with special needs and other disadvantaged groups. In many human societies, especially in Northern Nigeria, Kano State, and Rogo community, cultural practices have reinforced the neglect of individuals born with deformities or those living in poverty. Such individuals are often dehumanized to the extent that children with disabilities are allowed to hawk or roam the streets begging for alms instead of receiving proper care.

Families often depend on wealthier members of the community for support, while those with disabilities remain neglected and deprived of educational opportunities, health care, and access to employment or skills acquisition that would enable them to become responsible and productive members of society. These conditions prompted the need to investigate the factors that hinder the participation of persons with special needs in community life and to explore ways to address these issues. Why not organize activities within our community to address destitution, poverty, and the lack of awareness regarding the need to treat every individual equally? Unfortunately, these attitudes persist because, even today, persons with special needs are excluded from decision-making processes, including within their families. Their children are abandoned, left to roam the streets instead of going to school. They are denied health care and lack access to vital information regarding their well-being.

Currently, Rogo community has been adopting strategies such as advocacy, consultation, group action, and dialogue to enlighten key stakeholders, including traditional institutions, self-help groups, community-based organizations, foundations, and religious leaders. The aim is to help them recognize the fundamental rights of persons with special needs, the principle of equal opportunity, and the need to provide social services to these individuals. This forms the rationale for conducting the research titled: Community- Based Rehabilitation Activities and Promotion of Inclusive Participation of People with Special Needs in Rogo Local Government Area, Kano State. It is against this background that this study seeks to investigate the impact of community-based rehabilitation activities on the promotion of inclusive participation of persons with special needs in Rogo Local Government Area of Kano State.

Statement of the Problem

Persons with special needs (PWSNs) including those with long-term physical, mental, intellectual, or sensory impairments resulting from various conditions—are seriously excluded from many aspects of development. This exclusion spans across education, health, empowerment, access to opportunities (e.g., information, skills, and training), as well as political participation, such as involvement in decision-making and governance at the national, state, local government, and grassroots levels. In human societies, especially in Northern Nigeria, Kano State, and Rogo community in particular, cultural practices have historically contributed to the neglect of persons with special needs. Those who are either born with deformities or who belong to poverty-stricken families are often dehumanized and neglected. In many cases, children with disabilities are allowed to hawk or roam the streets begging for alms instead of receiving care and support. Families often rely on wealthier members of the community to assist them, while individuals with special needs remain neglected and excluded from access to education, healthcare, employment information, and skills acquisition— opportunities that could enable them to become responsible, active, and productive members of society.

Unfortunately, these negative attitudes continue to persist. Even today, persons with special needs are excluded from decision-making processes—even at the family level. Their children are abandoned, left to roam the streets without education, and denied access to healthcare or vital information about their well-being. They are not trained to acquire employable skills, they are unemployed, and they are rarely consulted or included in governance at any level. As a result, persons with special needs remain socially, culturally, and economically excluded from most poverty reduction programs and community development initiatives. However, the Rogo community is beginning to implement strategies involving advocacy, consultation, group action, and dialogue with traditional institutions, self-help groups, community-based organizations, foundations, and religious leaders to promote awareness of the fundamental rights of persons with special needs and the importance of equal opportunities. This collective effort further justifies the need for the present study on Community-Based Rehabilitation Activities and Promotion of Inclusive Participation of People with Special Needs in Rogo Local Government Area, Kano State.

Objectives of the Study

The objectives of the study were to:

1. Identify the community-based rehabilitation (CBR) activities for persons with special needs that promote inclusive participation in Rogo Local Government Area, Kano State.
2. Determine the roles of caregivers in CBR activities in the promotion of inclusive participation in Rogo Local Government Area, Kano State.
3. Examine the level of participation of persons with special needs in CBR activities that promote inclusive participation in Rogo Local Government Area, Kano State.
4. Identify the challenges of CBR activities in promoting inclusive participation of persons with special needs in Rogo Local Government Area, Kano State.

Research Questions

The following research questions guided the study:

1. What are community-based rehabilitation (CBR) activities for persons with special needs that promote inclusive participation in Rogo Local Government Area, Kano State?
2. What are the roles of caregivers in CBR activities in the promotion of inclusive participation in Rogo Local Government Area, Kano State?
3. What is the level of participation of persons with special needs in CBR activities for the promotion of inclusive participation in Rogo Local Government Area, Kano State?
4. What are the challenges faced in the implementation of CBR activities for thepromotion of inclusive participation of persons with special needs in Rogo Local Government Area, Kano State?

Methodology

The study adopted a survey research design. A sample of 50 caregivers and 320 persons with disabilities was selected from a population of 2,909 in the study area using proportionate sampling procedure. A self-developed questionnaire was used for data collection. The instrument was validated by experts in the fields of Test and Measurement, Adult and Non-Formal Education, and Community Development from the Faculty of Education, Bayero University, Kano. The reliability of the instrument was established using the test- retest method, which yielded a reliability coefficient of 0.89 using Pearson Product Moment Correlation. Descriptive statistics, in the form of frequency counts and simple percentages, were used to analyze the data for the research questions.

Results and Discussions

Table 1: Community-based rehabilitation activities for persons of person with special needs in promotion of inclusive participation

Grand Mean 3.16

Statement	Responses				
	SA	A	D	SD	Mean
Creates awareness to persons with special needs in health-related issues	247 (67.3%)	26 (7.1%)	92 (25.1%)	02 (0.5%)	3.41
Create awareness to persons with Special needs on education	198 (54.0%)	140 (38.1%)	07 (1.9%)	22 (6.0%)	3.40
Create awareness in the provision of shelters to persons with special needs	100 (27.2%)	195 (53.1%)	45 (12.3%)	27 (7.4%)	3.00
Create awareness among to Persons with special needs on skill acquisition	174 (47.4%)	145 (39.5%)	26 (7.1%)	22 (6.0%)	3.28
Create awareness on Fundamental Human Rights of persons with Special needs	200 (54.5%)	131 (35.7%)	13 (3.5%)	23 (6.3%)	3.38
Create awareness to the persons With special needs on self-Acquisition & self-esteem	189 (51.5%)	111 (30.2%)	44 (12.0%)	23 (6.3%)	3.26

The table shows that 247 (67.3%) and 26 (7.1%) of the respondents strongly agreed and agreed, respectively, that CBR activities create awareness for persons with special needs on health-related issues. Meanwhile, 92 (25.1%) and 2 (0.5%) disagreed and strongly disagreed, respectively. The

mean score for this item was 3.41, which is above the table mean of 2.50, indicating that the majority with the statement. For the second item, 198 (54.0%) and 140 (38.1%) of the respondents agreed and strongly agreed, respectively, that CBR activities create awareness for persons with special needs on education. In contrast, 7 (1.9%) and 22 (6.0%) disagreed and strongly disagreed. The mean score for this response was 3.40, which is above the table mean of 2.50, suggesting that most respondents strongly agreed with the statement.

The table further reveals that 100 (27.2%) and 195 (53.1%) of the respondents strongly agreed and agreed, respectively, that CBR activities create awareness about the provision of shelters for persons with special needs. Conversely, 45 (12.3%) and 27 (7.4%) disagreed and strongly disagreed. The mean score was 3.00, which is above the table mean of 2.50, indicating that the majority of respondents agreed with the statement. Additionally, 174 (47.4%) and 145 (39.5%) of the respondents strongly agreed and agreed, respectively, that CBR activities create awareness for persons with special needs on skill acquisition. of respondents strongly agreed with the statement.

of respondents strongly agreed

On the other hand, 26 (7.1%) and 22 (6.0%) disagreed and strongly disagreed. The mean score was 3.28, which is above the table mean of 2.50, indicating that the majority of respondents strongly agreed with the statement.

Regarding the fifth item, 200 (54.5%) and 131 (35.7%) of the respondents strongly agreed and agreed, respectively, that CBR activities create awareness among persons with special needs on fundamental human rights, while 13 (3.5%) and 23 (6.3%) disagreed and strongly disagreed. The mean score was 3.38, which is above the table mean of 2.50, suggesting that the majority of respondents strongly agreed with this statement. Finally, the table shows that 189 (51.5%) and 111 (30.2%) of the respondents strongly agreed and agreed, respectively, that CBR activities create awareness among persons with special needs on self-acquisition and self-esteem. In contrast, 44 (12.0%) and 23 (6.3%) disagreed and strongly disagreed. The mean score was 3.26, which is above the table mean of 2.50, indicating that the majority

Table 2: Roles of community caregivers in CBR rehabilitation activities towards promotion of inclusive participation

Statement		**Responses**			
		SA	A	D	SD
Health promotion	103 (28.1%)	224 (61.0%)	6 (1.6%)	34 (9.3%)	3.07
Health Accessibility	168 (45.8%)	149 (40.6%)	20 (5.4%)	30 (8.2%)	3.23
Fundamental human Rights	106 (28.9%)	190 (51.8%)	46 (12.5%)	25 (6.8%)	3.02
Education	207 (56.4%)	106 (28.9%)	18 (4.9%)	36 (9.8%)	3.31
Association and participation	211 (57.5%)	124 (33.8%)	14 (3.8%)	18 (4.9%)	3.43
	Grand Mean				**3.22**

Table 2 presents the roles of community caregivers in community-based rehabilitation (CBR) activities toward the promotion of inclusive participation in Rogo Local Government Area, Kano State. The table shows that 103 (28.1%) and 224 (61.0%) of the respondents strongly agreed and agreed, respectively, that one of the roles of caregivers in CBR activities was health promotion, while 6 (1.6%) and 34 (9.3%) disagreed and strongly disagreed. The mean for this response was 3.07, which is above the table mean of 2.50, implying that the majority of respondents strongly agreed with the statement.

The table further indicates that 168 (45.8%) and 149 (40.6%) of the respondents strongly agreed and agreed, respectively, that one of the roles of caregivers in CBR activities was ensuring health accessibility, while 20 (5.4%) and 30 (8.2%) disagreed and strongly disagreed. The mean for this response was 3.23, which is above the table mean of 2.50, suggesting that the majority of respondents strongly agreed with the statement. Similarly, 106 (28.9%) and 190 (51.8%) of the respondents strongly agreed and agreed, respectively, that among the roles of caregivers in CBR activities was the promotion of fundamental human rights, while 46 (12.5%) and 25 (6.8%) disagreed and strongly disagreed. The mean for this response was 3.02, which is above the table mean of 2.50, indicating that the majority of respondents agreed with the statement. For the fourth item, 207 (56.4%) and 106 (28.9%) of the respondents strongly agreed and agreed, respectively, that caregivers in CBR activities play a role in the education of persons with special needs, while 18 (4.9%) and 36 (9.8%) disagreed and strongly disagreed. The mean for this response was 3.31, which is above the table mean of 2.50, implying that the majority of respondents agreed with the statement. Finally, the table reveals that 211 (57.5%) and 124 (33.8%) of the respondents strongly agreed and agreed, respectively, that caregivers in CBR activities played roles in creating associations for persons with special needs and assisting them in participating in community development. In contrast, 14 (3.8%) and 18 (4.9%) disagreed and strongly disagreed. The mean for this response was 3.43, which is above the table mean of 2.50, indicating that the majority of respondents agreed with the statement.

Table 3: Levels of participation of persons with special needs in community-based rehabilitation activities towards promotion of inclusive participation

Statement	Responses				
	SA	A	D	SD	Mean
Create networking among Persons with special needs, their Families &Community	156 (42.5%)	184 (50.1%)	13 (3.5%)	14 (3.8%)	3.07
Participate in decision making at Community level	**Grand Mean**	**3.25**			
Strengthen and facilitates Inclusive development					
140 (38.1%)	162 (44.1%)	30 (8.2%)	35 (9.5%)	3.23	
180 (49.0)	150 (40.9%)	24 (6.5%)	13 (3.5%)	3.02	

Table 3 presents the levels of participation of persons with special needs in community-based rehabilitation (CBR) activities toward the promotion of inclusive participation in Rogo Local Government Area, Kano State. The table indicates that 156 (42.5%) and 184 (50.1%) of the respondents strongly agreed and agreed, respectively, that the level of participation of persons with special needs in CBR activities involves creating networking among persons with special needs, their families, and the community. Meanwhile, 13 (3.5%) and 14 (3.8%) disagreed and strongly disagreed. The mean score for this response was 3.07, which is above the table mean of 2.50, implying that the majority of respondents agreed with the statement. The table further shows that 140 (38.1%) and 162 (44.1%) of the respondents strongly agreed and agreed, respectively, that the level of participation of persons with special needs in CBR activities includes participation in decision- making at the community level. In contrast, 30 (8.2%) and 35 (9.5%) disagreed and strongly disagreed. The mean score for this response was 3.23, which is above the table mean of 2.50, indicating that the majority of respondents agreed with the statement. Finally, the table indicates that 180 (49.0%)and 150 (40.9%) of the respondents strongly agreed and agreed, respectively, that the level of participation of persons with special needs in CBR activities strengthens and facilitates inclusive development. On the other hand, 24 (6.5%) and 13 (3.5%) disagreed and strongly disagreed. The mean score for this response was 3.02 which is above the table mean of 2.50, implying that the majority of respondents agreed with the statement

Table 4: Challenges of community-based rehabilitation activities toward promotion of Inclusive Participation

Statement	Responses				
	SA	A	D	SD	Mean
Funding	40 (38.1%)	78 (48.5%)	24 (6.5%)	25 (6.8%)	3.17
Acceptance & Recognition by the community caregivers & government	56 (42.5%)	63 (44.4%)	23 (6.3%)	25 (6.8%)	3.22
Lack of awareness in the provision of shelters among persons with special needs	63 (44.4%)	56 (42.5%)	24 (6.5%)	24 (6.5%)	3.24
Lack of cooperation	26 (34.3%)	96 (53.4%)	25 (6.8%)	20 (5.4%)	3.16
Lack of reliable data	44 (39.2%)	70 (46.3%)	23 (6.3%)	30 (8.2%)	3.16
Grand Mean					**3.19**

Table 4 presents the challenges in community-based rehabilitation (CBR) activities toward the promotion of inclusive participation in Rogo Local Government Area, Kano State. The table indicates that 140 (38.1%) and 178 (48.5%) of the respondents strongly agreed and agreed, respectively, that funding constitutes a challenge to CBR activities in promoting inclusive participation, while 24 (6.5%) and 25 (6.8%) disagreed and strongly disagreed. The mean response for funding as a challenge was 3.17, which is above the table mean of 2.50. This implies that the majority of respondents agreed with the statement.

The table also shows that 156 (42.5%) and 163 (44.4%) of the respondents strongly agreed and agreed, respectively, that acceptance and recognition by community caregivers and the government constitute challenges to CBR activities in promoting inclusive participation, while 23 (6.3%) and 25 (6.8%) disagreed and strongly disagreed. The mean response was 3.22, which is above the table mean of 2.50, implying that the majority of respondents strongly agreed with the statement. Another challenge faced by caregivers in CBR activities is the lack of awareness regarding the provision of shelters for persons with special needs. This is supported by 163 (44.4%) and 156 (42.5%) of the respondents who strongly agreed and agreed, respectively, while only 24 (6.5%) and 24 (6.5%) disagreed and strongly disagreed. The mean response was 3.24, indicating that the majority of respondents viewed the lack of awareness in the provision of shelters as a challenge to CBR activities in Rogo Local Government Area.

The table further shows that 126 (34.3%) and 196 (53.4%) of the respondents strongly agreed and agreed, respectively, that lack of cooperation constitutes a challenge to CBR activities in promoting inclusive participation, while 25 (6.8%) and 20 (5.4%) disagreed and strongly disagreed. The mean response was 3.16, which is above the table mean of 2.50, suggesting that the majority of respondents agreed that lack of cooperation is a challenge to CBR activities in Rogo Local Government Area.

The mean response was 3.16, which is above the table mean of 2.50, implying that the majority of respondents agreed that the lack of reliable data is a challenge to CBR activities in Rogo Local Government Area.

Summary of Findings

The following are the summary of the findings of this study:

1. The major activities of community- based rehabilitation (CBR) include creating awareness among persons with special needs on health, education, shelter, skills acquisition, human rights, and self- esteem- related matters.

The roles of community caregivers in CBR activities toward the promotion of inclusive participation in Rogo Local Government Area include assisting persons with special needs in health promotion, health accessibility, fundamental human rights, education, and participation in community associations.

2. There are high levels of participation of persons with special needs in community- based rehabilitation activities aimed at promoting inclusive participation in Rogo Local Government Area, Kano State. Many persons with special needs were awakened and sensitized to access social services. Their rights were also protected, safeguarded, and supported to engage in inclusive development at all levels.

3. The major challenges to community- based rehabilitation activities for promoting

inclusive participation in Rogo Local Government Area include inadequate funding, lack of sustainability, poor acceptance and recognition by community caregivers, poor cooperation from community members, lack of reliable data, and insufficient training and management of CBR activities.

Discussion of Findings

The first finding of this study reveals that the community-based rehabilitation activities for persons with special needs in the promotion of inclusive participation in Rogo Local Government Area of Kano State include advocacy, consultation, and creating awareness for persons with special needs on education, health promotion, shelter provision, fundamental human rights, skill acquisition, self-esteem, and self-reliance. Special emphasis was placed on vulnerable promotion, health accessibility, fundamental human rights, education, and participation in community associations.

4. There are high levels of participation of persons with special needs in community-based rehabilitation activities aimed at promoting inclusive participation in Rogo Local Government Area, Kano State. Many persons with special needs were awakened and sensitized to access social services. Their rights were also protected, safeguarded, and supported to engage in inclusive development at all levels.

5. The major challenges to community- based rehabilitation activities for promoting

inclusive participation in Rogo Local Government Area include inadequate funding, lack of sustainability, poor acceptance and recognition by community caregivers, poor cooperation from community members, lack of reliable data, and insufficient training and management of CBR activities.

Discussion of Findings

The first finding of this study reveals that the community-based rehabilitation activities for persons with special needs in the promotion of inclusive participation in Rogo Local Government Area of Kano State include advocacy, consultation, and creating awareness for persons with special needs on education, health promotion, shelter provision, fundamental human rights, skill acquisition, self-esteem, and self-reliance. Special emphasis was placed on vulnerable groups such as the blind, aged, armless, deaf, orphans,

and persons with physical disabilities who require community-based intervention, protection, and rehabilitation. Community-based rehabilitation activities are among the key community development strategies and serve as a philosophy of empowering, mainstreaming, strengthening, and promoting inclusive participation of persons with special needs.

In Rogo Local Government Area, Kano State, community-based rehabilitation activities are supported by community- based organizations, foundations, and faith-based organizations. For example, Tafidan Rogo Foundation, Maimunatu Foundation, and community faith-based organizations such as Jamāʿatul Izālatul Bidʿa wa Iqāmatul Sunnah (Rogo Branch) actively participate in rehabilitation initiatives aimed at promoting inclusive participation of vulnerable community members, especially persons with special needs.

The second finding of this study revealed the roles of community caregivers in CBR activities for the promotion of inclusive participation in Rogo Local Government Area, Kano State. Community rehabilitation caregivers particularly those concerned with persons with disabilities, such as community development workers, social welfare officers, doctors, nurses, families,and traditional institution advocate strategies to change the mindset and attitudes of community members. They provide proper care, protection, and preventive measures for disabilities from an early stage. These caregivers help promote the health, well-being, and wellness of persons with special needs, empowering them to become active members of the community. Women with disabilities, in particular, benefit from improved independence and self-esteem within Rogo Local Government Area.

Disability People's Organizations (DPOs), faith-based organizations, and foundations also play significant roles in improving access to social services such as health and education through various interventions. These roles have strengthened and encouraged persons with special needs to interact freely without prejudice or discrimination while safeguarding their fundamental human rights at all community levels in Rogo Local Government Area. Community-based rehabilitation caregivers identify children with special needs and ensure their enrollment in school at all levels. They also provide financial support by budgeting for their educational expenses annually to promote inclusion and participation.

The third finding of this study revealed that community-based rehabilitation activities promote the involvement of persons with special needs in community affairs at all levels. Persons with special needs now recognize their rights, such as the right to education, health care, employment, and improved social status. Their participation has increased to such an extent that they are no longer excluded from their homes, ward- level governance, or local government affairs. They now have representatives in key positions such as village head offices, wards, districts, and even local government administration, including special advisers on disability matters.

Conclusion

Community-based rehabilitation (CBR) activities serve as a panacea for inclusive development and social inclusion of persons with special Needs. They are timely, necessary, and desirable community interventions aimed at reducing prejudice, discrimination, and stereotypical attitudes toward persons with special needs at all levels of the community and society at large. In Rogo Local Government Area, Kano State, CBR activities have played a significant role in enlightening, sensitizing, advocating for, and mobilizing both material and non-material resources. These efforts have helped in mainstreaming, facilitating, and promoting respect for the rights of persons with special needs, enabling them to exercise their conventional rights. Through the revival of joint associations and the integration of concerned individuals, groups, foundations, and faith-based organizations, CBR activities have provided relief, support, and assistance to these disadvantaged groups.

Recommendations

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

1. Rogo Local Government Area, Kano State should strengthen and improve its political will and commitment to further integrate persons with special needs. This should be achieved through collaboration with all concerned individuals, groups, foundations, and faith-based organizations to foster inclusive development.
2. The local government should engage all stakeholders in disability advocacy to conduct a comprehensive census of persons with special needs. This will help identify their number, as well as their social, economic, and political status.
3. Although a disability law has been enacted, it is yet to be fully implemented. Proper implementation is crucial for inclusion, expansion of opportunities, and poverty reduction among persons with special needs, particularly in Rogo Local Government Area.
4. Rogo Local Government Area and the state government should prioritize social development, social investment activities, and social protection programs to ensure effective inclusion of persons with special needs at all levels.

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Enhancing MVM Teachers Competencies in Diagnosing Electrical/Electronic Faults of Modern Automobile in Technical Colleges North-West Nigeria.

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Abstract

Advancements in cutting-edge technology have revolutionised the automobile industry, ushering in an era where electronic components and systems are integral to vehicle operation. The ability to diagnose and fix faults in these complex systems is challenging for automobile professionals. This study aimed to identify essential diagnostic competencies for Motor Vehicle Mechanics (MVM) teachers in Nigerian technical colleges to address electrical/electronic faults in modern automobiles. Using a descriptive survey design, 139 participants (MVM teachers, instructors, and industry mechanics) from 20 North-West Nigerian technical colleges rated 47 competencies via a validated questionnaire ($\alpha = 0.90$). Three hypotheses proposed no significant differences in competency perceptions among participant groups. All 47 competencies across three domains were believed necessary (mean ratings > 2.5): Collecting customer concerns (M = 3.74–4.46), Evaluating fault evidence (M = 3.60–4.46) and logical sequence diagnosis (M = 4.00–4.41). ANOVA confirmed no group differences: $F(2,137) = 0.278$, $P = .758$, $F(2,137) = 0.082$, $P = .921$and $F(2,136) = 1.044$, $P = .355$. To meet the NBTE objective, the study concludes that MVM teachers require urgent upskilling in modern diagnostic procedures. Recommendations include: professional development workshops, hands-on training with diagnostic tools, and curriculum integration of logical troubleshooting sequences and ECU/sensor technologies.

Keywords: *Automobile Diagnostics*, Motor Vehicle Mechanics (MVM) Teachers and Electrical/Electronic fault diagnosis.

Introduction

Vocational and Technical Education (VTE) is a type of education whose major objective is to prepare individuals for employment in chosen occupations by equipping them with the technical skills, knowledge, and attitude necessary for employment in specific occupations of their choice. It equips individuals with the requisite technical skills for survival in the world of work. Tampang and Wonggo, (2018) describe VTE as a type of education that combines theory and practice with more practical skills aimed at preparing trainees who can compete successfully in skilled trade and industry. Industrial needs are constantly revolutionising with the needs of society, and the automotive industry is rapidly evolving with advancements in technology, particularly in the electrical and electronic components of modern vehicles. As vehicles become increasingly complex, the role of motor vehicle mechanic (MVM) teachers in technical colleges becomes pivotal in ensuring that future mechanics are equipped with the necessary competencies to diagnose and repair faults effectively (NBTE, 2024). However, there is a growing need to identify and understand the specific competencies MVM teachers require to navigate the intricacies of diagnosing electrical and electronic faults in modern automobiles.

Modern automobiles combine cutting-edge technology, engine performance systems, safety features, and environmentally sustainable practices to offer efficient, convenient, and safe transportation for people worldwide (Klyde & VanGelder, 2018). Moreover, the engine performance system is monitored by OBD II to detect and identify ill operation, a decrease in performance or deterioration of any component system or even mechanical damage, usually before the driver notices the problem (Denton, 2021).

Diagnosis in an automobile is a process of applying knowledge to trace a fault by analysing and synthesising symptoms to its root, intending to undertake maintenance to restore the vehicle's utmost performance to the manufacturer's standard. VanGelder (2023) Perceived the diagnostic procedure as a holistic approach that depends on effective communication, particularly from the customer to the technician, regarding what's going wrong with the vehicle.

The Industrial needs are constantly changing with the needs of society, and the use of computerised systems in modern cars has changed how we diagnose problems from relying on experience to using data and systematic methods. In Nigeria, however, technical colleges struggle to produce graduates who can effectively diagnose electrical and electronic faults. This is due to outdated programs, insufficient teacher training, and a lack of alignment with current industry needs (Birniwa & Idris, 2023; Lemo, 2025). Tackling the modern automobile diagnostic challenge, vanGelder (2023) proposes diagnostic steps for troubleshooting modern automobile electric and electronic faults in Nigerian technical colleges. These diagnostic steps aim to overcome problems such as reliance on trial and error, poor use of diagnostic tools, and inadequate focus on identifying root causes. There's also a need to update the MVM teachers to include skills needed for today's workshops, such as mechatronics and diagnostics. Reforming technical education is necessary.

Effective diagnostic competence is vital for MVM teachers, especially considering the increasing complexity of modern automotive systems, which include advanced electrical and electronic components like Engine Control Units (ECUs) and sensor network features (Klyde, 2021). This competence involves systematic information collection, logical fault diagnosis, and structured troubleshooting processes (Denton, 2021). However, MVM teachers encounter significant challenges in Nigeria, including outdated equipment, insufficient training, and a curriculum slow to incorporate technological advancements (Olaniyi et al., 2024). These barriers hinder the development of practical diagnostic skills, making it difficult for teachers to effectively instruct students in accurate, efficient, and safe troubleshooting techniques (John et al., 2024). Consequently, despite the vital role of MVM teachers in preparing industry-ready professionals, systemic issues hinder their ability to provide high-quality, current diagnostic training.

Statement of the problem

As outlined in the curriculum of technical colleges, an MVM teacher is a skilled expert capable of imparting diagnostic knowledge and skills necessary for employment that enable students to secure a job or practise their trade to the extent of employing others upon graduation. However, Bugaje (2020) outcries the incompetence of present technical college teachers; technical college teachers cannot attain their mandate of teaching and assessing skills necessary to meet the challenges of the local environment and industries. Medashe and Abolarin, (2020) opined that the use of modern diagnostic facilities facilitates an effective diagnostic process It appears that the bulk of automobile teachers in Nigeria's technical colleges and those graduating from tertiary institutions are not properly trained to acquire the modern

Automobile electrical and electronic fault diagnosis skills and competencies needed for effective teaching and learning of automobile electricity at technical colleges. In VTE, the quality of a product bears a direct relationship with the quality of the teacher and teaching materials deployed in the teaching and learning process (Badejo, 2023). Abdulkadir et al., (2020) and Lemo (2025) opined that technical college teachers are ill-equipped in terms of the skills necessary to prepare learners for industries, self- reliance, and further education. Poor students' performance resulting from poor teachers' competencies also discourages further education among MVM craftsmen, who may remain jobless and become a problem to society. This study addresses the gap in MVM teachers' diagnostic skills for modern vehicles by exploring ways to enhance their competencies in modern automobile electrical and electronic systems in Technical Colleges.

Research Question

The following research questions are formulated to guide the study:

1. What are the competencies needed by MVM teachers in collecting information on customer concerns about the faults of modern automobiles with electrical/ electronic components in technical colleges?
2. What are the competencies needed by MVM Teachers in evaluating the evidence of electrical/electronic component faults in modern automobiles in technical colleges?
3. What are the competencies needed by the MVM Teacher in carrying out further diagnoses in a logical sequence of Electrical/Electronic component faults of modern automobiles in technical colleges?

Methodology

The study was carried out in 20 technical colleges offering MVM in North-west Nigeria. The study employed a descriptive survey research design. A population of 139, consisting of all 48 MVM teachers anall 23 Instructors, were used, and a purposive sampling method was applied to select 68 industry service mechanics for the study, as not all mechanics possess the skills necessary for diagnosing modern vehicles. A questionnaire titled "Enhancing the Diagnostic Procedures Competencies of MVM Teachers" was used, consisting of 47 diagnostic competency items, which were adapted from NASTF (National Automotive Service Task Force). A five-point Likert scale was employed, with a mean rating of 2.5 serving as the acceptance criterion. The instrument was validated by three technology education experts; the instrument was pilot-tested using Cronbach's alpha, and a reliability of 0.90 alpha coefficient was obtained. Consent from management of the respective organisations was sought, and anonymity of the responders was observed. Mean and standard deviation were used for descriptive statistics, and one-way ANOVA was used to test the hypothesis at a 0.05 significance level. Lower-rated items, such as unfamiliar sounds, scan tool use, also highlight gaps in current training, especially where practical or advanced tool use is concerned.

Results

1. What are the competencies needed by MVM Teachers in collecting information on customer concerns in electrical/electronic components faults of modern automobiles in technical colleges?

Table 1: Mean score of items on the ability to Collect Customer Concerns Rating

S/N	Items	$\bar{XT}$ n=48	SDT	$\bar{XI}$ n=23	SDI	$\bar{XM}$ n=68	SDM	$\bar{XA}$ Nt=139	Rem
Ability to collect further information on customers' concerns:									
1	Thorough Visual inspection	4.49	0.78	4.50	0.74	4.40	0.76		ND
2	Unfamiliar Audible sound	3.50	1.19	3.96	0.98	3.91	1.06	3.79	ND
3	Burning odour	3.56	1.18	3.78	1.09	3.87	1.06		ND
4	Abnormal rise in temperature	3.81	1.20	3.78	1.24	3.93	1.03		ND
5	Service History	4.13	1.00	3.78	0.80	4.16	0.87		ND
6	How long has the problem persisted	3.71	1.13	4.04	1.15	3.91	1.02		ND
7	Nature of the problem	4.19	0.94	4.26	0.75	4.19	0.87		ND
8	Components affected	4.21	0.97	4.13	0.81	4.15	0.80		ND
9	Effect of the fault	4.00	1.03	3.87	0.76	4.00	0.95		ND
10	Recent repairs	3.79	0.97	3.96	0.71	3.97	0.69		ND
11	Evidence of body damage or repairs	3.73	1.05	3.78	0.90	3.96	0.87		ND
12	Check for everything that does and does not operate correctly								
13	Check for normal voltage								
14	Operational conditions: temperature, load, speed, and rain.							3.98	ND
15	Identify appropriate scan tools and perform necessary actions.								ND

Source: *Field data (2024).*

Key: $\bar{XT}$ = Mean Response of MVM Teachers
SDT = Standard Deviation of MVM Teachers
$\bar{XI}$ = Mean Responses of Instructors.
SDI = Standard Deviation of Instructors.
$\bar{XM}$ = Mean Response of Mechanics.
SDM = standard Deviation of Mechanics
$\bar{XA}$ = Mean Total.
Needed Rem = Remark
N_t = Total number of respondents
NT = Number of MVM Teachers
NM = Number of Mechanics
N_i = Number of Instructors
HN = highly needed
ND = Needed
MN = Moderately

Table 1 highlights the distribution of respondents' opinions regarding the necessity for MVM teachers to gather more information to substantiate customer concerns when diagnosing electrical and electronic fault components in technical colleges. Furthermore, the mean rating ranges from 4.46 to 3.74; the respondents' responses exceed the mean rating criterion of 2.5. It also shows that the standard deviation falls within the range of 0.69 to 1.10.

2. What are the competencies needed by MVM Teachers in evaluating the evidence of electrical/electronic component faults of modern automobiles in technical colleges?

Table 2. Mean score of items on the ability to evaluate the evidence of Automobile Electrical/Electronic component faults.

S/N	Items	X_1	SD_1	X_2	SD_2	X_3	SD_3	X_t	Rem
		N_1=48		N_2=23		N_3=68		N_t=139	
	Ability to evaluate the evidence of faults in:								
16	Battery system	4.43	0.93	4.45	1.22	4.42	0.86	4.43	ND
17	Charging System	4.44	0.80	4.04	1.02	4.38	0.85	4.29	ND
18	Starting system	4.38	0.79	4.39	0.66	4.26	0.70	4.34	ND
19	Ignition system	4.52	0.82	4.50	0.60	4.36	0.81	4.46	ND
20	Fuel system	3.96	1.13	4.30	0.63	4.06	0.94	4.11	ND
21	Lighting system	4.21	0.82	4.35	0.71	4.24	0.79	4.27	ND
22	Driver information system	3.96	1.01	3.96	0.98	4.01	0.91	3.98	ND
23	Electrical Accessories	4.04	0.94	4.00	0.80	3.94	0.90	3.99	ND
24	Transmission system	4.17	0.93	3.96	1.40	4.07	0.95	4.07	ND
25	Heating and Air-conditioning System								
26	Safety System	4.06	1.06	3.83	0.98	3.93	1.01	3.94	ND
27	Enhancement system	3.63	1.18	3.78	0.85	3.66	1.10	3.69	ND
28	Electric steering system	3.77	1.11	3.78	0.95	3.75	0.97	3.77	ND
29	Electric brake system	4.02	0.96	4.04	0.82	3.96	0.90	4.01	ND
30	Electric suspension and stability system	3. 83	1.14	4.13	0.69	4.50	0.94	4.15	ND

Source *field data (2024)*

Table 2 depicts the mean rating range from 4.46 to 3.60, which is above 2.5 mean criteria. It presents the opinions and distribution of the respondents' views on the 15 competencies required by MVM Teachers for evaluating evidence of automobile electrical and electronic fault components, as all the mean ratings were above 2.5. The table also reveals the distribution of opinions, which ranges from 0.80 to 1.31. indicating the respondents are close in their opinion.

3. What are the competencies needed by the MVM Teacher in carrying out the further diagnosis in a logical sequence of Electrical/Electronic component faults of modern automobiles in technical colleges?

Table 3. Mean responses on items of Competencies to Diagnose Further in a Logical Sequence Rating.

S/N	Items	X_1 N_1=48	SD_1	X_2 N_2=23	SD_2	X_3 N_3=68	SD_3	X_t N_t=139	Rem
	Ability to diagnose in logical sequence**:**								
31	Locate and interpret vehicles' major component identification numbers.	4.23	1.24	4.48	0.85	4.44	1.00	4.38	ND
32	Identify and interpret electrical/electronic system concerns; determine necessary action.	4.17	0.97	4.26	0.75	4.28	0.93	4.24	ND
33	Research applicable vehicle service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins, and determine necessary action	4.31	0.88	4.04	1.02	4.32	0.82	4.22	ND
34	Diagnose electrical/electronic integrity in series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	4.17	0.83	4.35	0.71	4.37	0.75	4.30	ND
35	Used wiring diagrams during diagnosis of electrical circuit problems to compare and determine necessary action.	3.92	1.16	3.91	1.28	4.19	1.10	4.01	
36	Demonstrate the proper use of a digital multimeter (DMM) during the diagnosis of electrical circuit problems, including source voltage, voltage drop, current flow, and resistance and determine necessary action	4.17	1.08	4.09	1.20	4.29	0.98	4.18	
37	Check electrical circuits with a test light; determine necessary action.	4.04	1.13	4.23	0.75	4.27	0.95	4.18	
38	Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.	3.94	1.12	4.04	1.26	4.10	1.13	4.03	ND
39	Check electrical circuits using fused jumper wires; determine necessary action.	4.08	1.20	4.30	0.93	4.28	0.99	4.22	ND
40	Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.	4.00	0.99	4.35	0.83	4.24	0.92	4.20	ND
41	Measure and diagnose the cause(s) of excessive parasitic draw; determine necessary action.	3.79	1.07	4.17	1.23	4.13	0.91	4.03	ND
42	Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.	4.06	1.16	4.22	0.80	4.18	0.90	4.15	ND
43	Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary actions.	4.23	1.10	4.65	0.57	4.34	0.96	4.41	
44	Remove and replace the terminal end from the connector; replace the connectors and terminal ends.	4.04	1.14	4.22	1.00	4.06	0.99	4.11	
45	Repair wiring harness (including CAN/BUS systems).	3.90	1.08	4.00	1.17	4.10	0.99	4.00	
46	Perform solder repair of electrical wiring.	4.15	0.97	3.83	1.47	4.01	1.01	4.00	

Source: field data (2024)

Table 3 discloses that the mean rating ranges from 4.41 to 4.00, which is higher than 2.50. It indicates the belief of the respondents on 16 competency items presented concerning MVM Teacher needs in carrying out further diagnosis in a logical sequence of Automobile Electrical/Electronic component fault in technical colleges in North-West Nigeria. The table shows that all the responses indicated the status of needs. In addition, the table also opens the distribution of the opinion between the respondents in terms of the means, with the range of distribution falling between 0.71 to 1.26, respectively.

Hypothesis One

Ho1: There is no significant difference in the mean response of MVM teachers, instructors, and industry automobile mechanics on the competencies needed for MVM teachers to collect further information on customer concerns in diagnosing electrical/electronic fault components in technical colleges in northwest Nigeria.

Table 4: *ANOVA Statistical Analysis of Hypothesis One on collecting further information on customer concerns in diagnosing electrical/electronic fault components.*

	Mean Square	**df**	**F**	**Sig.**	**Effect Size η^2**	**Decision**
Between Groups	.058	2	.278	.758	0.004	Accepted
Within Groups	.209	137				
Total		139				

Table 4. The results indicate that F (2, 137) 0.278 and p = 0.758. The p-value exceeds the significance level, and a small effect size (η^2 = 0.004) suggests that only 0.4% of the variance in competency scores is accounted for, which supports the acceptance of the null hypothesis

Ho2: There is no significant difference in the mean response of MVM teachers, instructors and industry automobile mechanics on the competencies needed of MVM teachers to evaluate the evidence of customer concerns in diagnosing electrical/ electronic fault components in the technical college, North-West Nigeria

Table *5:* *ANOVA Statistical Analysis of Research Question Two on evaluating the evidence of customer concerns in diagnosing electrical/electronic fault components.*

	Mean Square	df	F	Sig.	Effect Size η^2	Decision
Between Groups	.022	2	.082	.921	0.001	Accepted
Within Groups	.272	137				
Total		139				

Table 5. The result indicated that F (2, 137) = 0.082, P = 0.921. Since P = 0.921 is greater than 0.05, and a small effect size ($\eta^2 = 0.001$), indicating that only 0.1% of the competency score variance.

Hypothesis Three

Ho3: There is no significant difference in the mean response of MVM teachers, instructors and industry automobile mechanics on the competencies needed by MVM teachers to carry out further diagnosis in a logical sequence of the evidence in diagnosing electrical/electronic fault components in the technical college, north-west Nigeria

Table *6:* *ANOVA Statistical Analysis of Research Question Three on carrying out the further diagnosis in a logical sequence of the evidence in diagnosing electrical/electronic fault components.*

	Mean Square	Df	F	Sig.	Effect Size η^2	Decision
Between Groups	.453	2	1.044	.355	0.015	Accepted
Within Groups	.433	136				
Total		139				

The result presented F (2, 137) = 1.044 and P = 0.355. Since P = 0.355 is greater than 0.05. The negligible effect size ($\eta^2 = 0.015$) suggests that group membership explains only 1.5% of the variance in competency scores.

Findings

1. The finding for collecting further information on customer concerns discloses that all the items were identified as competencies needed by the MVM Teachers in diagnosing electrical/electronic fault components in technical colleges. The corresponding hypothesis, the null hypothesis, was accepted
2. The findings regarding the competency in evaluating the evidence of automobile electrical/electronic fault components show that all the items were accepted as competencies needed by the MVM Teacher in diagnosing automobile electrical/ electronic fault components. The corresponding hypothesis reveals that the null hypothesis was accepted.
3. The findings concerning carrying out further evaluation in logical sequence in diagnosis were all accepted as competencies needed by the MVM Teachers in diagnosing automobile electrical/electronic fault components. The corresponding hypothesis depicts that the null hypothesis was accepted.

Discussion

The findings regarding collecting further information on customer concerns indicate the importance and relevance of collecting information, and the use of diagnostic skills and knowledge by MVM teachers is highlighted as relevant and also needed in teaching automobile diagnosis in technical colleges. This competency is in line with and very relevant to the opinions of Medashe and Abolarin (2020), who emphasise acquiring relevant competency skills for modern automobile diagnosing electrical/electronic fault components to open service and repair garages. Denton (2021) expressed the need to collect further information on customer concerns as a step in modern automobile diagnosis. In automobile workshops, technicians are often required to interact with customers to understand the symptoms or issues they are experiencing with their vehicles. By integrating this competency into classroom teaching, MVM teachers aim to prepare students for the practical challenges they will face in their future careers. In the context of diagnosing electrical and electronic fault components, VanGelder's (2023) assertion signified the need for collecting further information, aligning with a systematic diagnostic process. MVM teachers recognise that a thorough understanding of the symptoms reported by the customer is essential for narrowing down potential issues. this approach contributes to a more efficient and accurate diagnostic process. This was also supported by the ANOVA statistics analysis on the competency of needs of MVM teachers on collecting further information on customer concerns for diagnosis of automobile electrical/electronic fault components; all the respondents have common perceptions on the issue of competency. The lower mean rating compared to other mean rating competencies is not due to skill or effort not needed, but rather to systemic gaps in training infrastructure, curriculum design, and instructor readiness. Addressing these issues will require curriculum reform, investment in modern tools, and better alignment with industry practices

The competency in evaluating the evidence of modern automobile electrical/electronic fault components shows that evaluating evidence of customers' concerns and knowledge, technical skills, is an essential component of modern automobile diagnosis. However, it stressed the importance and relevance of the competencies of evaluating evidence of customers' concerns to MVM teachers in teaching the diagnosis of modern automobiles in technical colleges. This translates to the agitation of diagnostic skills by Abdulkadir et al., (2020) Automobile teachers need diagnostic skills training for effective performance, service and maintenance of the modern automobile in higher colleges. The study of signs and evidence of malfunction is one of the key aspects of modern vehicle diagnosis (VanGelder, 2023). Competency in evaluating evidence is essential for MVM teachers to impart to their students. Modern automobiles generate a vast amount of diagnostic data, including error codes, sensor readings, and system outputs. Despite being rated as Needed, the item scored noticeably lower than most others. Some possibilities are perceived as less critical compared to systems, or receive less emphasis in training, especially regarding electrical-electronic diagnostics or being considered more mechanical than electronic, hence less focus on electronics-focused curricula. This may reflect a gap in the curriculum, where HVAC systems are not adequately covered despite their increasing integration with vehicle electronics, such as climate control modules and sensors. Teachers must guide students in accurately interpreting this evidence to pinpoint specific electrical or electronic component faults. The null hypothesis of the ANOVA analysis explains further in favour and strengthens the need for MVM teachers to exhibit the competences to evaluate evidence of malfunctions; the respondents all have no significant differences in opinions. The findings on competency in further evaluation in logical series in diagnosis indicate the acceptance of the competencies as needed by MVM teachers in diagnosing automobile electrical/electronic fault components. Furthermore, the findings stress the importance and relevance of further evaluation in a logical sequence to MVM teachers in diagnosing modern automobile electrical/electronic faults. The inference interprets the diagnosis approach explained by Denton (2021) and VanGelder (2023), teaching a logical sequence of diagnosis ensures that students follow a systematic approach, reducing the likelihood of overlooking critical steps. MVM teachers need to emphasise the importance of step-by- step procedures in diagnosing electrical/electronic component faults to enhance efficiency and accuracy. Competency in logical sequencing goes hand in hand with developing critical thinking skills. In this context, the cognitive theory of learning encompasses various perspectives on how people acquire, process, and use information related to the competencies of teachers in diagnosing modern automobile electrical and electronic component faults. Teachers may need to process information quickly, especially in a dynamic field like automobile technology. Cognitive theory suggests that interventions to enhance the speed of information processing can be beneficial. Furthermore, the work of Badejo, (2023) that automobile teachers' competency has a great impact on the students' academic performance in electrical/electronic systems. MVM teachers should guide students to think critically, analyse symptoms, and make informed decisions at each stage of the diagnostic process.

Competency in further evaluation in logical series suggests an integration of theoretical knowledge and practical application (Klyde, 2021). MVM teachers are expected to stress the importance of connecting classroom learning to real- world scenarios, helping students apply theoretical concepts in a structured manner during diagnostic procedures. Lastly, a logical series in diagnosis promotes efficient resource tilisation. By systematically evaluating components, technicians can prioritise testing based on the likelihood of a fault, saving time and resources. This competency is aligned to optimise the diagnostic process in terms of both time and cost. The findings regarding hypothesis four disclose the approval of the respondents for the need for competency in further evaluating in logical sequence in modern automobile diagnosis of electrical/electronic fault components in technical colleges in northwest Nigeria.

Recommendations

1 MVM teachers should be provided with opportunities for continuous professional development through workshops, seminars, and training sessions focused on the latest advancements in automotive technology, diagnostic tools, and information collection techniques.

2 MVM teachers should acquire competency in evaluating automobile electrical faults through hands-on training with multimeters, oscilloscopes, and diagnostic scanners. Simulated scenarios replicating common faults should be used. Additionally, subscriptions to the Technical Support Base (TSB) database would be beneficial.

Conclusion

The study concludes that teaching and learning in technical colleges should reflect the needs of industries and society. This study focuses on assessing the competency needs of MVM teachers in diagnosing automobile electrical/electronic fault components in technical colleges in north- west Nigeria. Specifically, the study identified competency procedures to enhance the diagnostic process among MVM teachers in technical colleges. New technology, new tools, and equipment require new methods and ways of doing things. Effective teaching and learning in technical colleges can be accomplished only by the use of competent MVM teachers. A fully competent MVM teacher can cope successfully with any professional problems, classroom theories and instructional methods, as well as teaching workshop practical diagnostic procedures for modern Automobiles. The study identified some of the necessary competencies for MVM teachers in diagnosing modern automobile electric/ electronic faults.

3 MVM teachers should learn the logical series diagnostic procedure and have a strong foundation in basic electrical principles and electronic components. Learn a detailed study of components.

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Impact of School & Teacher Strategies on Inclusive Education in Kebbi State, Nigeria

By

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Abstract

This study investigated the impact of administrative strategies on the implementation of inclusive education in Kebbi State, Nigeria. The study adopted a cross-sectional survey research design. Participants were randomly selected and consisted of three hundred and ninety-six (44 Principals. 176 Teachers &176 Students). Three standardized instruments were adapted and used (Inclusive education 0.74, Teachers strategies 0.76 & students' strategies 0.78 scales). Four research questions and one hypothesis were generated to guide the study. Descriptive statistics, ANOVA, correlation, and regression analysis were used to analyzed the data. The result showed that school strategies significantly impact inclusive education in Kebbi State ($F(6, 390) = 407.101$, $p < .001$). There was a significant effect of teacher strategies on inclusive education ($F(10, 386) = 280.087$, $p < .001$). There was a significant positive relationship between student strategies and inclusive education ($r = .228$, $p < .01$). Sschool strategies, teacher strategies, and student strategies have a joint influence on inclusive education ($R^2 = 0.899$, $F(3, 393) = 1161.22$, $p < .05$). The study recommends that the Kebbi State Government should enhance administrative strategies by focusing on collaborative efforts with parents, improving teacher training on inclusive practices, and increasing resource allocation to schools. Furthermore, creating an enabling environment for implementing inclusive education policies and engaging local communities in the process can help foster an inclusive culture in schools

Keywords: *school strategies,* teacher strategies, and student strategies, inclusive education

Introduction and Literature Review

Every child has the fundamental right to education, irrespective of their abilities or unique gifts. Education aims to ensure accessibility, relevance, affordability, appropriateness, and effectiveness within the community (USAID, 2019; Teshabaeva, Mahmudova, &Yuldasheva, 2020; Cahyadi, Widyastuti, & Mufidah, 2021). Achieving this goal involves mobilizing essential resources, transforming mainstream institutions, enhancing human expertise, and adapting general infrastructure to accommodate the diverse needs of all learners. Jensen (2022) argues that inclusion fosters confidence, social skills, and a sense of belonging for students with disabilities while also teaching typical students valuable traits like kindness, compassion, and patience-qualities that enrich the community. Hence, Inclusive education aims to ensure that all children, regardless of their abilities or disabilities, have access to quality education within mainstream schools. Equally, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and Sustainable Development Goal 4 also emphasized that inclusive and equitable quality education for all is a fundamental right.

The movement towards Inclusive Education (IE) for learners with special learning needs began in the 1960s. The United Nations has made influential declarations regarding inclusive education, such as the Convention against Discrimination in Education (1960) that mandated persons with disability to access education without discrimination. The declaration on the Rights of Disabled Persons (1975) guaranteed the respect and dignity of the persons living with disability and the Convention on the Rights of the Child (1989) endorsed the right of every child. Similarly, the World Conference of 1990 (Jomtien Declaration) in Thailand, set goals of Education for All (EFA), which was reaffirmed in the Dakar Framework of 2000 in Senegal.

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Inclusive education seeks to ensure that all students, regardless of their abilities or disabilities, have equal access to quality education. It is built on the principle that all students, regardless of their abilities or disabilities, have the right to participate in mainstream education. In an inclusive education system, schools are expected to accommodate every child, create supportive learning environments, and provide appropriate resources to ensure equitable access to education. However, despite growing global recognition of inclusive education, its implementation in many developing countries remains inadequate due to various systemic challenges.

Nigeria is among the African countries that has made remarkable advances in the pursuit for inclusive education. The government has embraced and supported the practice of inclusive education by domesticating various international agreements in its laws (Njoka et al., 2012). The policy framework recommended that all secondary schools adopt, design and implement programs that carry out inclusive education. In spite of inclusive education policy, disability remains a major course of exclusion in schools. The Nigerian strides in advocating for the inclusion of special needs students in mainstream schools. However, despite these efforts, challenges remain, particularly in terms of administrative strategies and planning. In Nigeria, the pursuit of inclusive education is articulated in the National Policy on Education, which emphasizes equal access to education for all, including children with special needs (Federal Ministry of Education, 2013).

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Statement of the Problem

Despite policy frameworks on inclusive education, Kebbi State schools lack coherent administrative strategies, resulting in low inclusion metrics, it experiences socio-economic barriers, inadequate funding, lack of infrastructural facilities and a lack of teacher preparedness on inclusive practices, which is compounded by administrative problems within schools. Many schools have decrepit structures with no libraries, laboratories and other support facilities that can accommodate the policy. Kebbi State faces numerous socio-economic challenges that directly impact its educational system. The region is characterized by high levels of poverty, limited infrastructure, and a lack of specialized training for educators. These factors have contributed to the marginalization of students with disabilities, who often face systemic barriers to accessing education. Although some schools in the state have attempted to implement inclusive education policies, many are struggling to create learning environments that are truly inclusive for students with special needs. Similarly, the state experiences major hitches which include negative cultural attitudes towards disability, shortage of resources, poor funding and inadequate teacher training on inclusive practices and lack of mobility devices, which discourage resource allocation to learning institutions. To fill the gap observed in this aspect, this study therefore investigates the impact of administrative strategies on the implementation of inclusive education in Kebbi State, Nigeria.on.

Research Questions

i. What is the impact of school strategies on inclusive education in Kebbi state
ii. What is the influence of teacher strategies on inclusive education in Kebbi State
iii. What is the relationship between student strategies and inclusive education in Kebbi State.
iv. What is the joint contribution of school, teacher and student strategies to the lementation of inclusive education in Kebbi State.

Research Hypothesis

The following hypothesis guided this study; $H0^1$: There is no significant difference between the administrative strategies and the implementation of inclusive education in Kebbi State

Methodology

This study adopted a cross-sectional survey research design, being descriptive and explanatory research that demands the technique of observation of the target respondents as a principal means of data collection. The target population for this study comprised of some key stakeholders in secondary schools education in all the 21 Local Government Areas of Kebbi State. They include Principals, Quality Assurance Officers, Directors of Education, teachers and students. Simple random sampling technique was used to select three local governments; fifteen secondary schools were randomly selected from each of the three (3) selected local governments. (fourteen 14 secondary schools were selected at Jega, this is due to the fact that the local government has 14 secondary schools as at the time of this study). Also, 44 Principals, 176 Teachers, and 176 Students were randomly selected, making the total sample to be 396. Three (3) Standardized instruments were adapted and used for the data collection, this includes: Inclusive Education Scale (IED), which was used to measured participants view on inclusive education and was developed by Emily, (2023). The instrument has 13

items with the scoring format of five liker scale ranging from SA, A, U, D and SD. It was pilot tested on the 10 participants who are not original sample of this study. The instrument has 0.74 Cronbach Alpha level. Also, Teachers Strategies Scale (TSC), this was used to measured teachers' perception on inclusive education, it was adapted scale on Perception of teachers towards inclusive education (PTIE) scale which was developed by Ka-Lam Sam, Fuk-Chuen Ho, and Sze-Ching Lam (2015). The scale has 11 items with scoring format of not all true, hardly true, moderately true and exactly true. It was pilot tested on 10 participants who are not original participants of this study, and has 0.76 Cronbach Alpha. The students' perception on inclusive education was measured by the Students' Strategies Scale (SSS), this scale was adapted from Perception of students towards inclusive education (PTIE) scale which was developed by Ka-Lam Sam, Fuk-Chuen Ho, and Sze-Ching Lam (2015). The scale has 17 items with scoring format of strongly agreed, agreed, undecided, disagreed and strongly disagreed. The scale was pilot tested on 10 students who are not original participants of this study, and has 0.78 Cronbach Alpha. The data obtained from the study were analyzed using descriptive and inferential statistics. Simple percentage and standard deviation were used to answer the research questions, while hypotheses was tested using Structural Equation Modeling (SEM), and Analysis of Variance (ANOVA), this is due to the fact that there are more than two levels of the independent variables used. The hypotheses were tested at 0.05 level of significance

Results

Research Question One: What is the impact of school strategies on inclusive education in Kebbi State?

Table 1: ANOVA Results for the Impact of School Strategies on Inclusive Education

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50,566.793	6	8,427.799	407.101	.000
Within Groups	8,073.771	390	20.702		
Total	58,640.564	396			

The ANOVA results indicate that school strategies significantly impact inclusive education in Kebbi State ($F(6, 390) = 407.101$, $p < .001$). The significant p-value suggests that differences exist among the various school strategies regarding their influence on inclusive education.

Research Question Two: What is the influence of teacher strategies on inclusive education in Kebbi State? This was tested using one-way ANOVA and the results was presented in Table

Table 2: ANOVA Results for the Influence of Teacher Strategies on Inclusive Education

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	51,537.910	10	5,153.791	280.087	.000
Within Groups	7,102.654	386	18.401		
Total	58,640.564	396			

The results show a statistically significant effect of teacher strategies on inclusive education ($F(10, 386) = 280.087$, $p < .001$), suggesting that teacher strategies play a crucial role in enhancing inclusive education.

Research Question Three: What is the relationship between student strategies and inclusive education in Kebbi State?

Table 3: Pearson Product Moment Correlation Showing the Relationship Between Student Strategies and Inclusive Education

Variables	Mean	S.D	r	P
Student Strategies	46.01	8.39	.228**	<.01
Inclusive Education	53.54	12.17		

$p < .01$ (2-tailed).

The results obtained from the table 3 indicates a significant positive relationship between student strategies and inclusive education ($r = .228$, $p < .01$). This implies that students who employ more strategic approaches towards learning tend to experience better outcomes in inclusive education.

Research Question Four: What is the joint contribution of school, teacher, and student strategies to the implementation of inclusive education in Kebbi State?

Table 4: Summary of Multiple Regression Analysis Showing the Influence of School, Teacher, and Student Strategies on Inclusive Education

Predictors	β	T	p	R	R^2	F	P
School Strategies	.515	21.483	<.05				
Teacher Strategies	.508	20.364	<.05	.948	.899	1161.22	<.05
Student Strategies	-.021	-1.236	.217				

The results revealed that school strategies, teacher strategies, and student strategies have a joint influence on inclusive education ($R^2 = 0.899$, $F(3, 393) = 1161.22$, $p < .05$). When combined, school strategies, teacher strategies, and student strategies accounted for 89.9% of the variance in inclusive education. This indicates that these strategies' collective presence significantly influences Kebbi State's inclusive education. Furthermore, the results revealed that school strategies ($\beta = .515$, $t = 21.483$, $p < .05$) and teacher strategies ($\beta = .508$, $t = 20.364$, $p < .05$) have significant independent influences on inclusive education. However, student strategies ($\beta = -.021$, $t = -1.236$, $p = .217$) do not significantly contribute to the model. **Hypothesis Testing**

H_{01}: There is no significant difference between administrative strategies and the implementation of inclusive education in Kebbi State. This was tested using multiple regression analysis and the results are presented in Table 4.5.

Table 5: Summary of Multiple Regression Analysis Showing the Influence of Administrative Strategies on Inclusive Education

Predictors	B	T	p	R	R^2	F	P
School Strategies	.518	21.726	<.05	.948	.898	1738.743	<.05
Teacher Strategies	.499	20.916	<.05				

The results revealed that school and teacher strategies have a joint influence on inclusive education ($R^2 = 0.898$, $F(2,394) = 1738.743$, $p < .05$). This means that these administrative strategies accounted for 89.8% of the variance in inclusive education. The collective presence of school and teacher strategies significantly influences inclusive education in Kebbi State. School strategies ($\beta = .518$, $t = 21.726$, $p < .05$) and Teacher strategies ($\beta = .499$, $t = 20.916$, $p < .05$) have significant independent influences on inclusive education. Since the p-value is less than 0.05, the null hypothesis is rejected, confirming that administrative strategies (school and teacher strategies) significantly impact inclusive education in Kebbi State.

Discussion of findings

Research Question One: What is the impact of school strategies on inclusive education in Kebbi State? The study revealed that school strategies significantly impact inclusive education, confirming that well- structured policies, leadership, and resource availability directly influence the effectiveness of inclusion. Schools that embrace inclusivity through administrative commitment, well-equipped facilities, and strategic intervention programs create an environment where all students, regardless of their abilities, can thrive. This finding supports the argument by Ainscow et al. (2019) that inclusive education is most effective in schools that institutionalize policies accommodating students with disabilities and learning difficulties. A critical examination of these results suggests that school leadership plays a fundamental role in ensuring that inclusionvis not just a theoretical concept but a practical reality. Florian and Black- Hawkins (2011) assert that adjusting curricula, providing teacher support, and ensuring accessibility to learning resources are core components of effective inclusive school strategies. However, challenges remain in the execution of these policies, particularly in underfunded schools where infrastructural limitations hinder the effective implementation of inclusive learning practices. This suggests that while policies may exist, the ability of schools to implement them effectively remains a challenge.

Research Question Two: What is the influence of teacher strategies on inclusive education in Kebbi State? The study found that teacher strategies influence inclusive education, highlighting the crucial role that teachers play in fostering an inclusive learning environment. Teachers who adopt differentiated instruction, personalized learning, and student-centered pedagogies are better equipped to manage diverse classrooms and enhance student engagement. This is consistent with Sharma et al. (2018), who argue that teachers' attitudes, competencies, and classroom management strategies directly impact the success of inclusive education. An in-depth analysis of this finding suggests that teacher preparation is a crucial determinant of inclusive education success. Avramidis and Norwich (2002) emphasize that teachers who receive proper training on special education and inclusive pedagogies are more effective in accommodating diverse student needs.

Research Question Three: What is the relationship between student strategies and inclusive education in Kebbi State? The study established a significant positive relationship between student strategies and inclusive education, suggesting that students who engage in self-regulated learning, goal setting, and active participation are more likely to succeed in inclusive learning environments. This aligns with Zimmerman's (2002) self- regulation theory, which posits that students with high levels of self-efficacy and motivation perform better academically. Similarly, Bandura (1997) highlights that self-directed learning strategies contribute to students' ability to adapt in diverse educational settings. However, the study also found that student strategies, though important, do not independently predict inclusive education success when school and teacher strategies are considered. This implies that while students' learning behaviors contribute to their academic success, they alone cannot drive inclusivity without institutional and instructional support. This aligns with Tschannen-Moran and Woolfolk Hoy (2001), who argue that student engagement is largely influenced by the quality of teaching and the learning environment. A critical perspective on this finding suggests that although student strategies are relevant, they are often shaped by external factors such as school climate, teacher effectiveness, and availability of learning resources. In many cases, students may possess strong learning strategies, but without institutionalized support systems, their ability to thrive in an inclusive setting remains limited. Therefore, an integrated approach—where schools, teachers, and students work collaboratively—is essential for the success of inclusive education.

Research Question Four: What is the joint contribution of school, teacher, and student strategies to the implementation of inclusive education in Kebbi State? The study revealed that school, teacher, and student strategies collectively contribute to inclusive education, explaining a significant proportion of the variance in inclusion outcomes. However, the individual contributions of school and teacher strategies were stronger than that of student strategies, reaffirming the argument that institutional and instructional factors are the primary drivers of inclusive education. This finding is consistent with Mitchell (2014), who emphasizes that successful inclusive education requires a comprehensive, multi-stakeholder approach where schools provide enabling environments, teachers deliver differentiated instruction, and students actively engage in the learning process. The UNESCO (2020) framework also underscores the importance of integrating all education stakeholders to ensure equitable learning opportunities for all students.

The study's findings indicate that student strategies alone cannot drive inclusive education, as students often rely on structured school policies and effective teaching methodologies to succeed. This reinforces the argument that schools and teachers hold more influence over inclusive education than student strategies alone. This has implications for policy, suggesting that efforts to improve inclusive education should prioritize strengthening school governance and teacher training programs before expecting significant improvements in student engagement.

Conclusion

Based on the findings, this study concludes that school and teacher strategies are the most critical factors in the successful implementation of inclusive education in Kebbi State. The presence of structured school policies and effective teaching approaches significantly enhances inclusive learning environments. Although student strategies contribute positively, their independent influence is not significant when school and teacher strategies are accounted for.

Additionally, administrative strategies, particularly the leadership of school authorities, were found to be significant determinants of inclusive education. Schools that implement well-structured inclusive education policies and provide adequate teacher training are more likely to create environments that support students of diverse abilities. Therefore, ensuring that school leadership prioritizes inclusive education remains a crucial factor in the success of these programs.

The study highlights the importance of continuous teacher training, administrative support, and well-designed school policies in fostering inclusive education. Without these elements, the goals of inclusive education may not be fully realized, and students with diverse needs may not receive the support necessary for their academic success.

Implications of the Findings

The findings of this study have several implications for education stakeholders, including policymakers, school administrators, teachers, and students.

For policymakers, the study emphasizes the need for stronger government policies that mandate inclusive education frameworks in schools. There should be adequate funding for inclusive education programs, ensuring that schools have the necessary resources to implement these strategies effectively. Additionally, national education policies should incorporate inclusive teaching practices and ensure that teacher training programs include modules on special and inclusive education.

For school administrators, the study highlights the importance of leadership in inclusive education. School leaders must ensure that inclusive education policies are well- implemented and monitored for effectiveness. Administrators should also create supportive environments for teachers, providing training programs that enhance teachers' ability to handle diverse learning needs.

For teachers, the findings indicate that their teaching methods significantly impact inclusive education. Thus, continuous professional development programs should be prioritized to equip teachers with the skills needed to accommodate diverse students in inclusive classrooms. The use of differentiated instruction and student-centered learning approaches should be encouraged to enhance the effectiveness of inclusive education.

For students, the findings suggest that while their learning strategies play a role, school and teacher influences remain the most critical. Therefore, students should be encouraged to take ownership of their learning by engaging in peer support systems, active participation in class, and self-directed learning techniques.

Recommendations

Based on the findings of this study, the following recommendations are proposed to improve the implementation of inclusive education in Kebbi State:

i. Schools should implement clear and structured inclusive education policies that are regularly reviewed and updated.

ii. There should be adequate provision of learning materials and infrastructural support to facilitate inclusive education by the government.

iv. Teachers should undergo regular training on inclusive education to better accommodate students with diverse learning needs.

v. Schools should encourage collaborative teaching models where teachers work together to design effective instructional strategies for inclusive classrooms.

vi. Schools should provide counselling and mentoring programs to help students develop effective learning strategies.

vii. Government should allocate more resources to inclusive education training and infrastructural development.

viii. Policy makers should ensure that teacher education programs include modules on inclusive education to equip future educators with the necessary skills.

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Integration of Social Studies into STEAM Education: A Paradigm Shift for Relevant Learning Experiences in Primary & Junior Secondary School Children

By

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Abstract

This paper explores the integration of Social Studies into Science Technology Engineering Arts and Mathematics (STEAM) education as a means of creating relevant learning experiences for Primary and junior secondary school children. The study adopts descriptive survey research design. The population of the study consists of all Social Studies teachers in public Primary and junior secondary schools in Ojo Local Government Area of Lagos State. Stratified sampling technique was used to select three (3) Social Studies teachers and two (2) STEAM teachers making a total of five (5) respondents from ten (10) selected public Primary and junior secondary schools in Ojo LGA. This forms a total sample of fifty (50) respondents. Data were collected using a researcher developed questionnaire titled, Paradigm Shift on Social Studies and STEAM Questionnaire (PSSSSQ). Frequency statistical table of mean and standard deviation were used to analyze data collected for the study. Findings revealed that incorporating social studies into STEAM enhances students' ability to connect classroom learning with real- world issues, fosters critical thinking, promotes civic engagement, and supports holistic development. However, challenges such as inadequate teacher training, limited instructional resources and rigid curricular structures hinder effective integration. The study concludes that integrating social studies into STEAM is a transformative strategy that can make primary and junior secondary education more meaningful, contextual and impactful for young learners. The Study recommends the need for curriculum reform, professional development for teachers, and development of integrated learning materials, stakeholders sensitization and further research

Keywords: *Integration;* Paradigm Shift; Social Studies; STEAM education; Relevant Learning; Experiences.

Introduction

A paradigm shift refers to a fundamental change in the underlying assumptions, approaches, or frameworks through which knowledge is understood, interpreted and applied. The term was popularized by Thomas S. Kuhn (1996) in his influential work The Structure of Scientific Revolutions, where he described paradigm shifts as transformative changes in scientific thought that occur when existing theories can no longer explain new evidence or phenomena, leading to the adoption of a new theoretical framework. According to Kuhn, a paradigm shift represents a move from one dominant model of understanding to another, often triggered by anomalies that challenge the status quo. This shift is not merely a gradual evolution but a revolutionary change in thinking. For example, the shift from Newtonian mechanics to Einstein's theory of relativity is a classic scientific paradigm shift. In the context of Primary and junior secondary school education, a paradigm shift often involves rethinking teaching and learning philosophies, moving away from traditional, teacher-centered approaches to more learner-centered, inquiry-based and interdisciplinary frameworks.

. For instance, the integration of Social Studies into Science Technology Engineering and Mathematics (STEAM) education represents a paradigm shift from packed subject instruction to a more connected and contextualized model of teaching that prepares Primary and junior secondary school children for real-world challenges (Beers, 2011). Such shifts are essential in modern primary and junior secondary education systems to meet the demands of 21st-century skills, including critical thinking, collaboration, creativity and civic literacy. Primary and junior secondary school educational reform requires not only structural changes but also deep cultural and pedagogical transformation. A true paradigm shift is how we perceive and deliver education.

In the context of Social Studies, a paradigm shift involves moving away from traditional rote memorization of historical facts, civic rules and geographic content toward a more interdisciplinary, inquiry-driven and learner-centered model that connects social understanding with real-world problem- solving and technological literacy. Traditionally, Social Studies has been taught in isolation, emphasizing passive acquisition of civic knowledge and national identity. However, recent educational reforms recognize that such approaches are no longer adequate in preparing Primary and junior secondary school children for the complexities of the 21st century. This paradigm shift also aligns with constructivist theories, which advocate that children build knowledge through active engagement and real-world contexts. According to Larson and Keiper (2013), embedding Social Studies within broader STEAM contexts enhances children's ability to apply civic and ethical reasoning to technical and scientific challenges, thus producing more socially conscious and competent individuals.

Transforming Social Studies in Nigerian Primary and Junior Secondary Schools

A paradigm shift in Social Studie education within Nigerian Primary and junior secondary schools signifies a fundamental transformation from the traditional, content-heavy and examination- driven approach toward a more experiential, interdisciplinary and child-centered pedagogy that promotes critical thinking, civic responsibility and real-world application of knowledge. This paradigm shift is critical in responding to the growing need of Nigerian children to acquire 21st- century skills such as problem-solving, digital literacy, collaboration and social consciousness. Traditionally, in Nigerian Primary and junior secondary schools, Social Studies has focused on the passive memorization of civic duties, historical facts and moral values, often disconnected from the learners' immediate environment and contemporary challenges (Ololobou, 2010). However, the dynamic and complex nature of modern society, driven by technological advancement and globalization, demands a new model of education. This is where the integrating Social Studies with Science, Technology, Engineering, Arts and Mathematics (STEAM) education comes in as a paradigm shift to create a holistic and relevant learning experience. This transformation involves redesigning Social Studies as a discipline that not only teaches civic values but also equips learners with the ability to apply those values in scientific, technological and environmental contexts.

For example, pupils may explore community health issues (linking science and civic education), sustainable environmental practices (merging geography and technology), or digital citizenship (combining ICT and social values). Such integration fosters functional education, as prescribed by Nigeria's National Policy on Education (FRN, 2014), by preparing learners for responsible citizenship and productive life in a rapidly changing world. Therefore, integrating Social Studies into STEAM education in Nigerian Primary and junior secondary schools is not just a curriculum adjustment, it is a paradigm shift that redefines the goals, content and methods of teaching Social Studies and STEAM education towards more relevant, inclusive and transformative learning.

Social Studies is an interdisciplinary field that draws from history, geography, civics, sociology and anthropology to help children understand human society and their roles within it (National Council for the Social Studies [NCSS], 2010). In both Primary and junior secondary schools, Social Studies cultivates cultural awareness, social responsibility, emocratic values and interpersonal skills, which are essential components for holistic education. In Primary and junior secondary school education, where foundational attitudes and behaviours are formed, Social Studies becomes a crucial factor for developing children's emotional intelligence and social awareness, traits imperative for collaboration and ethical engagement in Science Technology Engineering Arts And Mathematics (STEAM) contexts (Durlak et al., 2011). That is to say, the future of education lies not only in technical innovation but in the cultivation of empathy, ethics and social responsibility. These qualities cannot be nurtured solely through traditional methods, therefore Social Studies, with its focus on human behaviour, culture, justice and civic engagement, provides the emotional and moral grounding that STEAM education needs to be socially transformative.

Integration of Social Studies in STEAM Education in Primary and Junior Secondary Schools

STEAM in Primary and junior secondary school education is an interdisciplinary teaching approach that integrates Science, Technology, Engineering, Arts and Mathematics to foster critical thinking, creativity, collaboration and problem- solving skills in Primary and junior secondary school children. It builds upon the earlier concept of STEM by incorporating the Arts as an essential component of holistic learning, aiming to develop children's cognitive, affective and psychomotor skills. STEAM education can be defined as an educational approach that combines Science, Technology, Engineering, Arts and Mathematics into an integrated curriculum that promotes inquiry, dialogue and critical thinking. This integrated model seeks to enhance children's ability to make connections across disciplines, apply their learning in real-world contexts and develop 21st- century skills such as communication, collaboration, creativity and innovation (Beers, 2011). The core objectives of STEAM education include:

- Interdisciplinary learning: STEAM breaks down the silos of individual disciplines to encourage cross- curricular connections (Quigley & Herro, 2016).
- Creativity and Innovation: Including the arts helps nurture imagination and emotional expression, often leading to innovative solutions to complex problems (Land, 2013).

- Hands-on problem solving: Learners engage in project-based learning that mirrors real-life challenges and applications (Honey, Pearson, & Schweingruber, 2014). Inclusion and Equity: STEAM fosters inclusive learning by reaching children with diverse learning styles and backgrounds (Sousa & Pilecki, 2013).

  STEAM education emphasizes interdisciplinary learning, creativity and problem-solving, however, emotional intelligence and social competence are essential to this model, as collaborative inquiry, ethical reasoning and effective communication are necessary for STEAM projects (Henriksen, 2014; Yakman & Lee, 2012).

  The integration of Social Studies into Science, Technology, Engineering, Arts and Mathematics (STEAM) education is a vital strategy for fostering holistic development in Primary and junior secondary school children. While STEAM primarily emphasizes cognitive and technical competencies, the inclusion of Social Studies addresses the often- neglected social and emotional dimensions of learning. Presently, science technology engineering arts and mathematics education has gained prominence as a pedagogical framework that integrates the arts and humanities into the traditional Science Technology Engineering and Mathematics (STEM) domains to foster creativity and innovation. Integrating Social Studies with STEAM through project-based learning encourages real-world problem-solving.

- For instance, children could design sustainable communities by integrating geographical knowledge (Social Studies), architectural design (Engineering) and environmental science (Science). Studies show that social and emotional learning programmes integrated into Social Studies curricula result in improved academic achievement, reduced behavioural problems and enhanced emotional regulation (Durlak et al., 2011). Furthermore, interdisciplinary STEAM programmes incorporating Social Studies themes have been shown to increase children's engagement and innovation. For example, a study by Mahoney et al. (2018) found that children in classrooms with a strong social and emotional learning and Social Studies emphasis performed better in collaborative STEAM tasks. Another study by Martin et al. (2020) revealed that integrating Social Studies themes in STEAM projects helped students connect emotionally to scientific problems, thereby increasing motivation.

Real Project Scenarios or Empirical Examples of the Integration

Real project scenarios or empirical examples of how Social Studies have been integrated into STEAM education in Nigeria, drawing on implemented initiatives and documented pilot programs include: The Piloting Game Jam in Nigeria to Support Empathy and Compassion. In this project, a participatory game jam taught youth (ages 12-20) to design games exploring identity, ethnicity and inter-group empathy across Nigeria's cultural diversity. This project fused computer programing (technology) and storytelling (arts) with Social Studies themes about national identity, civic cohesion and empathy, Bodunde, Alugo, Emami and Babatunde, 2021).

Wellesley Centre for Women (WCW) STEAM Camps in Internally Displaced Persons (IDP) Settlements near Abuja (2022). Conducted in internally displaced persons camps around Abuja (Waru, Wassa, Kuchingoro) for approximately 600 children aged 10–16. Activities included coding, robotics, science experiments and artistic expression (beading,

jewelry and storytelling) rooted in local culture. Social Studies was integrated by drawing on cultural identity, local languages and community-based inquiry, helping students reflect on displacement, societal cohesion and heritage through their STEAM projects (Ibrahim, 2022).

roject iCommunity STEAM Contest, Lagos (2023). This project was organized by Chevron Nigeria, NNPCL and STEAM Fun Fest in partnership with Lagos State. Over 500 public school students engaged in design-thinking projects: e.g., a battery- powered hot water bottle, solar-powered bulbs, educational apps. These projects required social-contextual understanding, such as local needs analysis (e.g. energy access, women's health, mobile learning), blending technical innovation with community-awareness and problem- solving, a form of social studies integration in local contexts (Oso, 2023).

Universal Basic Education Commission (UBEC) STEAM Modules (2024-25).

UBEC led a four-day workshop in Nasarawa State developing STEAM teaching modules for basic education. The modules intentionally integrate arts, humanities and social studies elements into science and technology lessons, encouraging culturally relevant content, civic awareness and indigenous knowledge systems alongside STEM learning (Lawal, 2024).

Civic Innovation Lab's "STEAM BOX" for Rural Communities (2020). Civic Innovation Lab takes mobile learning to rural areas. A mobile STEAM learning kit delivered curriculum in local languages (e.g. Hausa, Fulfude) to rural children. A notable learner designed an app to track cattle rustling, linking technical coding skills with social issues in agrarian communities, infusing civic awareness and problem solving with STEAM learning (Civic Innovation Lab, 2020).

Classroom Challenges and Disconnects on Integration of Social Studies into STEAM Education include:

Curriculum fragmentation, traditional curricula are compartmentalized, making interdisciplinary teaching difficult. Social Studies is often taught in isolation from STEAM subjects, limiting students' ability to make meaningful connections across disciplines (Beers, 2011; Yusuf & Onasanya, 2020).

Teacher capacity and training gaps, many teachers lack adequate professional development on how to integrate civic and social themes into STEAM instruction. Studies indicate a lack of interdisciplinary teaching strategies among teachers trained in either the sciences or humanities, not both (Okebukola, 2021).

Assessment misalignment, standardized assessments focus on subject-specific content, leaving little room for evaluating interdisciplinary thinking. This discourages teachers from implementing integrated STEAM projects that include Social Studies components (Adesoji & Idowu, 2022).

Resource constraints, lack of adequate teaching resources especially in public schools, limits the effective integration of STEAM subjects with Social Studies. For example, technology tools, digital maps, and culturally relevant materials are often unavailable (Aina, 2020).

Overemphasis on STEM at the expense of humanities, policy frameworks and school initiatives often prioritize Science and Technology, neglecting the role of Social Studies in shaping civic responsibility and ethical reasoning (Igbokwe & Eze, 2023). This

leads to disconnects in integrating human-centered inquiry into technical problem-solving.

Limited time and overloaded timetables, teachers face pressure to complete subject-specific syllabi, leaving little time for project-based learning that blends STEAM with civic themes. This limits creative integration opportunities (UNESCO, 2022).

Theoretical Framework

The integration of Social Studies into Science Technology Engineering and Mathematics (STEAM) education is grounded in several interrelated educational theories that support interdisciplinary learning, contextual relevance and holistic development in Primary and junior secondary school children. This theoretical framework draws primarily on constructivism, experiential learning theory and social reconstructionism, which collectively underpin the rationale for merging Social Studies with science, technology, engineering, arts and mathematics to enhance educational outcomes.

Constructivist Theory (Piaget, 1954; Vygotsky, 1978): Constructivism posits that learners construct knowledge actively through interaction with their environment and prior experiences. Integrating Social Studies into STEAM education aligns with this view by providing opportunities for children to build meaning through inquiry, problem-solving and hands-on projects grounded in real-life social and cultural contexts. Vygotsky's emphasis on social interaction and the "zone of proximal development" (ZPD) further supports collaborative learning approaches where children co-construct knowledge through interdisciplinary tasks that reflect community and societal issues.

Experiential Learning Theory (Kolb, 1984): Kolb's experiential learning theory emphasizes learning through experience, reflection and application. By integrating Social Studies themes into STEAM education, children are engaged in experiential activities such as simulations, community-based projects and real-world problem-solving. These activities allow children to reflect on their roles in society, analyze historical and environmental phenomena and apply scientific and technological knowledge to address contemporary challenges, thereby making learning more relevant and enduring.

Social Reconstructionism (Counts, 1932; Freire, 1970): Social reconstructionism advocates for education that empowers learners to critique and transform society. The integration of social studies into STEAM aligns with this philosophy by encouraging children to explore societal issues, such as sustainability, inequality and technological impact from a multidisciplinary lens. This fosters critical consciousness and active citizenship, helping young learners see themselves as agents of change in their communities and beyond. Interdisciplinary Curriculum Theory (Drake & Reid, 2018): The interdisciplinary curriculum theory supports the breaking down of traditional subject boundaries to promote connected, coherent and meaningful learning. This theory justifies the blending of Social Studies with STEAM fields by advocating for integrated instruction that mirrors real- life complexity, encourages creative thinking and fosters the application of knowledge across domains. Therefore, the theoretical foundation of this study reflects a synergy between constructivist, experiential and socially-oriented educational theories. These perspectives collectively affirm that integrating Social Studies into STEAM education is not

only pedagogically sound but also essential for nurturing well- rounded, socially aware and critically engaged learners in both Primary and junior secondary school setting.

Statement of the Problem

The integration of Social Studies into Science, Technology, Engineering, Arts and Mathematics (STEAM) education has received limited attention in curriculum development, particularly at the Primary and junior secondary school level. While STEAM education is widely recognized for its potential to foster critical thinking, creativity, collaboration and innovation among learners, it often emphasizes technical and scientific knowledge at the expense of social, ethical and civic competencies. This creates a gap producing relevant learning experiences in Primary and junior secondary school children, who require not only academic and technological proficiency but also a strong foundation in social understanding, cultural awareness and responsible citizenship.

Traditional approaches to primary and junior secondary education tend to classify subjects, with Social Studies viewed as separate from the more technical STEAM disciplines. This fragmentation limits the opportunity for children to make meaningful connections between scientific knowledge and real-world social issues such as climate change, digital ethics, cultural diversity and community development. Consequently, children may develop technical skills without a deep understanding of their social implications or the moral responsibilities that accompany scientific advancements.

Moreover, there is a lack of empirical research and practical models demonstrating how Social Studies can be effectively integrated into STEAM frameworks to support the cognitive, affective, and psychomotor development of Primary and junior secondary school children. Without such integration, education systems risk producing learners who are technically capable but socially disconnected, thereby undermining the broader goals of education for sustainable development. Therefore, this study seeks to examine the integration of Social Studies into STEAM education as a transformative paradigm shift, exploring its potential to enhance the comprehensive development of Primary and junior secondary school children. It aims to identify effective strategies, benefits and challenges of such integration and to contribute to curriculum innovation that promotes balanced and socially responsible learners.

Objectives of the Study

The main objective of this study is to examine the integration of Social Studies into STEAM education as a paradigm shift for the holistic development of Primary and junior secondary school children. The specific objectives are to:

Explore the relevance of Social Studies in the context of STEAM education for promoting cognitive, affective and psychomotor development in Primary and junior secondary school children.

1. Identify the potential benefits of integrating Social Studies into STEAM education in fostering critical thinking, social awareness, ethical reasoning, and problem-solving skills.
2. Assess the challenges and limitations associated with the integration of Social Studies into STEAM education in Primary and junior secondary schools.

Research Questions

The following research questions were raised to guide the study:

1. What are the relevance of Social Studies to the goals and content of STEAM education at the Primary and junior secondary school level?
2. What are the perceived benefits of integrating Social Studies into STEAM education?
3. What challenges do educators and stakeholders face in the integration of Social Studies into STEAM education?

Methodology

The study adopts descriptive survey research design. The population of the study consists of all Social Studies teachers in both public Primary and junior secondary schools in Ojo Local Government Area of Lagos State. The area or location presents a ready population, hence its choice for the study. Stratified sampling technique was used to select three (3) Social Studies teachers and two (2) STEAM teachers making a total of five (5) respondents from ten (10) selected public Primary and junior secondary schools in Ojo LGA. This forms a total sample of fifty (50) respondents. The instrument for data collection is a researcher developed questionnaire titled, Paradigm Shift on Social Studies and STEAM Questionnaire (PSSSSQ). To ensure the reliability of the instrument, test- retest reliability test was carried out using Cronbach's Alpha which gave a reliability coefficient 0.72 that was used to consider the instrument reliable for the study.

The instrument contained two sections. Section A contained the demographic data of the respondents, while Section B contained 15 items designed for respondents to respond in line with the research questions. The research instruments made use of four (4) points Likert scale of Agree (A), Strongly Agree (SA), Disagree (D) and Strongly Disagree (SD), to get the response from the respondents. The instrument was validated by two experts in Social Studies and one expert in guidance and counselling, measurement and evaluation unit of Ignatius Ajuru University of Education, Port Harcourt Rivers State. A descriptive statistic such as the use of frequency statistical table of mean and standard deviation was used to analyze data collected for the study.

Data Analysis and Presentation

RQ1: 1. What is the relevance of Social Studies to the goals and content of STEAM education at the Primary and junior secondary school level?

Table 1: Relevance of Social Studies to the goals and content of STEAM education at the Primary and junior secondary school level.

SN	ITEMS	Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)	Mean X	Standard Deviation (S.D)	Decision
1	Social Studies helps students understand real-world problems	32	17	3	1	3.47	1.320	Strongly Agreed
2	Social Studies aids critical thinking & problem solving skills.	18	27	4	4	3.15	0.813	Strongly Agreed
3	Integrating Social Studies into STEAM enhances understanding.	28	14	2	7	3.44	0.989	Strongly Agreed
4	Social Studies promotes collaboration & communication	28	18	5	5	3.35	0.951	Strongly Agreed
5	Social Studies themes & STEAM objectives are Connected	27	17	7	8	3.06	0.725	Strongly Agreed

Source: Field Survey, 2025
Decision Rule: (If $\bar{X} \geq$ 2.5 'Agree' otherwise 'Disagree').
Key: S.D = Standard Deviation, $\bar{X}$ = Mean, DECI = Decision

Table 1 above revealed that respondents agreed with all the items in the table with the mean of 3.47, 3.15, 3.44, 3.35 and 3.06 for items 1, 2, 3, 4 and 5 respectively. This implies that all the points raised in the table are correct and agreed upon by respondents (Social Studies teachers and STEAM teachers) that integrating Social Studies into Science Technology Engineering and Mathematics (STEAM) education is a paradigm shift for creating relevant learning experience in Primary and junior secondary school children in Ojo Local Government Area of Lagos State.

RQ2: What is the perceived benefit of integrating Social Studies into STEAM education?

Table 2: Perceived Benefits of Integrating Social Studies into STEAM Education

S/N	ITEMS	Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)	Mean X	Standard Deviation (S.D)	Decision
1	Integrating Social Studies into STEAM education helps students relate learning to social issues.	34	18	2	1	3.51	1.224	Strongly Agreed
2	Social Studies components in STEAM activities does not enhance children's understanding of cultural contexts.	6	21	11	17	2.39	0.323	Disagreed
3	STEAM projects that include Social Studies promote active citizenship and social responsibility.	27	20	3	2	3.37	1.145	Strongly Agreed
4	Combining Social Studies with STEAM improves children's ability to solve community-based problems.	18	24	4	6	3.32	0.812	Strongly Agreed
5	Integrating Social Studies into STEAM education supports empathy, collaboration and communication skills in students.	20	19	6	55	3.05	0.572	Strongly Agreed

Source: Field Survey, 2025

(If $\bar{X} \geq 2.5$ 'Agree' otherwise 'Disagree').

Key: S.D = Standard Deviation, $\bar{X}$ = Mean, DECI = Decision

The table above revealed that respondents (Social Studies teachers and STEAM teachers) agreed with item 1 with a mean of 3.51. The respondents rejected item 2 with the mean of 2.39, which implies that Social Studies components in STEAM activities enhances children's understanding of cultural, historical and environmental contexts. Also, the result on the table shows that items 3, 4 and 5 were accepted with the mean of 3.37, 3.32 and 3.05 respectively.

This signifies that integrating Social Studies into Science Technology Engineering and Mathematics (STEAM) education is a paradigm shift for creating relevant learning experience in Primary and junior secondary school children in Ojo Local Government Area of Lagos State.

RQ3: What challenges do educators and stakeholders face in the integration of Social Studies into STEAM education

?

Table 3: Challenges Facing Educators and Stakeholders in the Integration of Social Studies into STEAM Education

S/N	ITEMS	Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)	Mean $\bar{X}$	rd Deviati	Decision
1	Lack of adequate training hinders effectively integration of Social Studies into STEAM education	23	20	6	3	3.31		Strongly Agreed
2	There is limited access to instructional resources that combine social studies with STEAM	8	22	11	9	2.93	0.626	Strongly Agreed
3	The current Primary and junior secondary school curriculum does not support integration of Social Studies into STEAM activities.	15	27	5	7	2.98	0.874	Strongly Agreed
4	Short school hours make it difficult to incorporate Social Studies meaningfully into STEAM activities.	16	23	4	3	2.90	0.609	Strongly Agreed
5	Stakeholders lack of understanding of the benefits of integration, affects support and implementation.	30	15	5	1	3.78		Strongly Agreed

Source: Field survey, 2025

(If $\bar{X} \geq 2.5$ 'Agree' otherwise 'Disagree').

Key: S.D = Standard Deviation, $\bar{X}$ = Mean, DECI = Decision

The result on table 3 above shows that respondents (Social Studies teachers and STEAM teachers) agreed with all the items in the table with the mean value of 3.31, 2.93, 2.98, 2.90 and 3.788 for items 1, 2, 3, 4 and 5 respectively. This indicates that all the points stated in table 3 constitutes the challenges faced by educators and stakeholders in the integration of social studies into STEAM education.

Discussion of Findings

The findings of the study indicate that the integration of Social Studies into STEAM (Science, Technology, Engineering, Arts, and Mathematics) education provides meaningful and relevant learning

experiences for Primary and junior secondary school children. Respondents, including Social Studies teachers and STEAM teachers, acknowledged that when Social Studies components such as culture, history, geography and civic responsibility are incorporated into STEAM activities, learners are better able to connect abstract scientific and mathematical concepts with their everyday lives and communities. This result aligns with the work of Beers (2011), who emphasized that integrating disciplines in a holistic manner promotes deeper learning by helping children construct knowledge through real-world applications. Social Studies serve as the contextual foundation upon which scientific and technological skills are built, thereby creating opportunities for learners to address societal issues such as environmental sustainability, technological ethics and cultural diversity through hands- on projects.

Furthermore, the study revealed that integrated STEAM-Social Studies projects foster active citizenship and collaborative problem-solving, which are essential 21st-century skills. According to Boix Mansilla et al. (2016), interdisciplinary learning, particularly through project-based approaches, helps children develop a sense of purpose in their learning by linking it to local and global challenges. Respondents in this study also noted that integrating Social Studies enhances empathy, critical thinking and communication, skills necessary for meaningful engagement in democratic societies.

However, the study also uncovered several challenges in achieving successful integration. These include a lack of professional development for teachers, insufficient instructional materials that align with both STEAM and Social Studies objectives and time constraints within the school day. These findings support the concerns raised by Drake and Reid (2018), who argued that while curriculum integration is beneficial, systemic barriers such as rigid curricular policies and limited teacher support can hinder effective implementation.

Moreover, stakeholders noted a general lack of awareness of the potential of social studies in enhancing STEAM learning outcomes, which echoes the observations of Bybee (2013) that integration efforts often overemphasize science and technology at the expense of humanities and social dimensions. This imbalance may limit children's ability to develop holistic problem-solving skills and ethical perspectives necessary for real-world decision-making.

Ultimately, the results of this study reinforce the growing body of literature that supports interdisciplinary approaches to education. Integrating Social Studies into

STEAM not only enriches content knowledge but also ensures that learning is socially grounded and personally relevant to Primary and junior secondary school children. Addressing the challenges identified requires a concerted effort to provide teacher training, revise curricula and promote stakeholder engagement to fully realize the potential of integrated STEAM-Social Studies education.

Conclusion

The integration of Social Studies into primary and junior secondary education is not merely a supplementary aspect of STEAM education but a foundational one. It presents a powerful approach to creating relevant and meaningful learning experiences for Primary and junior secondary school children. In fostering social and emotional competencies, Social Studies prepares children to become collaborative, empathetic and responsible participants in STEAM fields. It teaches children to view technological challenges through human-centered lenses, consider the ethical implications of scientific advances and appreciate cultural diversity in problem-solving approaches. As the global economy increasingly values creativity, ethical reasoning and teamwork, integrating Social Studies into STEAM education in primary and secondary education emerges as a strategic imperative for developing well-rounded STEAM learners. Therefore, educators, policymakers, and curriculum developers must prioritize the integration of Social Studies in STEAM education to cultivate emotionally intelligent innovators and socially conscious citizens. Ultimately, by embracing a model where Social Studies is seamlessly integrated into STEAM education, Primary and junior secondary schools can produce not just future scientists, engineers and artists but also compassionate leaders, informed citizens and socially conscious innovators. These are the very individuals the 21st-century world urgently needs.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed to enhance the integration of Social Studies into STEAM education for creating relevant learning experiences in Primary and junior secondary school children:

1. The Policymakers and Curriculum experts should revise the primary and junior secondary school curriculum to explicitly promote the integration of Social Studies with STEAM subjects, this is necessary to achieving the first objective of this study in exploring the relevance of Social Studies in the context of STEAM education to promote cognitive, affective and psychomotor development in primary and junior secondary school children.

2. The Educators, collaboration in teaching and planning should be encouraged among teachers in primary and junior secondary schools, across subject areas. Team- teaching and co-planning sessions can help generate creative ideas for integrating Social Studies into STEAM education and ensure consistency in instructional delivery. This will help to achieve the second objective of this study in identifying the potential benefits of integrating Social Studies into STEAM education in fostering critical thinking, social awareness, ethical reasoning and problem-solving skills.

3. The government, through the ministry of education and teacher training institutions should design and implement targeted professional development programmes that equip teachers with the skills, strategies and confidence to integrate Social Studies meaningfully into STEAM lessons. More so further research should be conducted to help achieving the third objective of this study, assessing the challenges and limitations associated with the integration of Social Studies into STEAM education in primary and junior secondary schools.

Acting on these recommendations, will enable education systems to harness the full potential of an integrated STEAM- Social Studies curriculum that not only enhances academic learning but also nurtures socially responsible and well- rounded citizens.

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Assessing Knowledge of Premarital Sickle Cell Screening among Kano's Tertiary Students: A Public Health Perspective

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Abstract

The study assessed knowledge of pre-marital sickle cell genotype screening among students of tertiary institutions in Kano State Nigeria. Three research questions were raised; three hypotheses were tested. Descriptive cross-sectional survey study was used for the study. The population of the study comprised 146,124 students of tertiary institutions in Kano State out of which 600 sample were selected through multi-stage sampling techniques. The instrument for data collection was a researcher developed questionnaire based on four point modified Likert scale. The instrument was validated by five experts in the Department of Human Kinetics and Health Education and subjected to pilot testing after which reliability coefficient of r = 0.75 was obtained. Descriptive statistics of frequency counts and percentage were used to describe the demographic data of the respondents, while chi-square was used to test hypotheses 1, t-test was used to test hypotheses 2 and 3 at 0.05 level of significance. The findings revealed that, students of tertiary institutions in Kano State have significant knowledge of premarital genotype screening (χ^2 = 496.067 df 1, P<0.05). There is no significant difference on knowledge of premarital genotype screening based on gender (t 1.703, df 575, P>0.05). There is significant difference in the knowledge of premarital genotype screening based on institution type (F= 41.756 df 576, (p<0.05). The study concluded that Kano State tertiary institutions students have knowledge of premarital genotype screening. Knowledge of premarital genotype screening among Kano State tertiary institutions students do not differ on base on gender. There is difference on knowledge of pre-marital genotype screening among Kano State tertiary institutions students based on institutions type. It was recommended among others that government should try to institute strong policies on mandatory premarital screening among students prior to marriage

Keywords: *Premarital genotype screening,* knowledge, pre-marital sickle cell, students of tertiary institutions

Introduction

Sickle cell disorder is one of the genetic diseases affecting Nigerians and its effective eradication and management constitute a challenge to both parents and health professionals due to the transmission of the genetic trait from parents to offspring, which lead to frequent hospitalization of the affected persons and associated mortality (World Health Organization 2016a). Despite major advances in molecular pathology that determines the causes of genetic disorders, infants and children are still dying of sickle cell disorder in Nigeria due to lack of appropriate screening/counseling measures before marriage. Premarital genotype screening is an important measure to control, minimize and prevent sickle cell disorders among the youth (World Health Organization, 2016b). It is a genetic disorder transmitted from parents to their offspring. The disorder is associated with many challenges resulting from frequent hospitalization of the affected individual.

Sickle Cell Disease (SCD) is an autosomal recessive genetic blood disorder characterized by red blood cells that assume an abnormal, rigid and sickle shape due to mutation in the hemoglobin gene. This sickle shape decreases the red blood cells' flexibility and causes vascular-occlusive (blockage of artery in arms) complications such as painful episodes at hands and chest, stroke, , liver disease, leg ulcers, spontaneous (unplanned) abortion and renal insufficiency, among others (Genetic Learning Center 2016). The disease was

named "Sickle Cell anaemia" by Vernon Mason in 1922. However, some elements of the disease have been recognized earlier: The African medical literature reported this condition in the 1870s, where it was known locally as ogbanjes children who come and go because of the very high infant mortality rate caused by this condition. A history of the condition tracked reports back to 1670 in one Ghanaian family (Herrick, 2001).

In Africa, a very high rate of childhood mortality 50%–90%, is observed as a result of lack of premarital genotype screening and due to lack of reliable, up-to-date information. In Nigeria, there is no doubt that the prevalence of the condition is increasing, especially among the urban educated elite and in other communities with access to effective basic health care. There is however, a palpable lack of information and education about the disorder within our communities, there is also growth of misconception, misinformation, inappropriate treatment, frustration and stigmatization about this condition as well as the confusion and controversy even among doctors and other health care workers about this condition (Scott, Isaac, Hani, Atrash, Amendah & Thomas, 2011).

According to the World Health Organization, sickle cell disorder contributes 5% of under-five children's deaths on the African continent; more than 9% of such deaths occur in West Africa and up to 16% of under-five deaths in individual West African countries (WHO 2016b). Study had revealed that about one hundred and fifty thousand children are born each year with sickle cell diseases and about 2-3% of Nigerians live with the disease, while 25-30% of Nigerians carry the defective gene that can give rise to sickle cell disease (Nnaji, Ezeagwuna, Nnaji, Osakwe, & Nwigwe 2013). It is estimated that by the year 2025, a total number of 50,000 children born in Nigeria will be affected with the sickle cell disorder, and this poses a great concern (WHO 2006b; Chakravorty & Williams, 2 015). The city of Kano has a large cohort of SCD patients. The SCD patient population is about 1,570 at the outpatient clinics of AKTH, Kano, of which 1,300 are pediatric patients. AKTH, Kano receives regular SCD referrals from the Murtala Muhammad Specialist Hospital, Kano, which is a secondary health facility with about 11, 000 registered SCD patients (Galadanci, Wudil, Balogun, Ogunrinde, Akinsulie, & Hasan-Hanga, 2014).

In order to prevent this disorder, sickle cell screening/counseling has been recommen dedfor couples before marriage (Chakravorty & Williams, 2015). If two parents who are carriers have a child, there is a 1-in-4 chance of their child developing the disease and a 1-in-2 chance of being just a carrier (Anie, Akinyanju & Egunjobi, 1980). Pre-marital genotype screening and counseling before marriage could serve as an important tool towards preventing sickle cell disorder. It could also help to achieve the desired level of knowledge and a change in attitude. Undertaking premarital sickle cell screening and counseling may depend on individual's knowledge of the sickle cell disorder. Although the knowledge gained about premarital sickle cell screening/counseling could help to prevent SCD, positive attitudinal behavior of the intending couples towards screening/counseling could lead to eradication of the sickle cell genetic disease in Nigeria (Anie, Akinyanju, & Egunjobi, 2015).

Pre-marital genetic screening can identify and modify behavioural, medical and other health risk factors known to impact pregnancy outcomes through prevention and management. It is capable of reducing the burden that birth defects and genetic disorders impose on most people (Chunang & Chen, 2008). According to Abd-Al- Azeem, Elsayed, El-Sherbiny & Abmed (2011), pre-marital

screening is mainly aimed at reducing the number of children with inherited diseases. It is a comprehensive group of tests for those who are planning to get married and highly beneficial for the couples who are under the following categories: Couples going for consanguineous marriage; If either/both have family history of a serious genetic condition, if they are carriers of the same faulty gene, if they have exposure to some chemical or other environmental agent and any abnormalities in the chromosomes. One of the biggest health challenges to the human race is sickle cell disorder. Despite major advances in our understanding of the molecular pathology, pathophysiology, and causes of the inheritable disorders, thousands of infants and children are dying through lack of appropriate preventive measures such as lack of premarital sickle cell screening by intending couples to know their genotype before marriage (WHO, 2008). However, the researcher observed during her undergraduate programme at Bayero University Kano number of students with university are alarming. Particularly in my level three of my course mates are sickle cell patient, having different crises at different climates. The researcher observed that they are so intelligent but due to frequent sickle cell crises and hospitalization during lectures particularly during winter period; in which the crises is constant due to cold weather they end of having very low CGPA. Information gathered by the research from those students was that each one of them has siblings with the same genotype problem at the same time having same kind of crises concurrently with the rest of their siblings at home. The burden of genotype crises is not only on the victims themselves; but also on their parents in both distracting them from their place of work as well the financial burden couple with possible loss of life.

The earlier statement therefore prompted the researcher to carry out are study on the knowledge and of pre-marital genotype screening among students of tertiary institutions Kano State, Nigeria.

Research Questions

In the view of the stated problems the study answered the following research questions:

1. Do students of tertiary institutions in Kano State have knowledge of pre- marital genotype screening?
2. Do students of tertiary institutions in Kano State differ in their knowledge of pre-marital genotype screening based on gender?
3. Do students of tertiary institutions in Kano State differ in their knowledge of pre-marital genotype screening based on institutions type?

Hypotheses

The following Hypotheses were formulated and guide the study:

Ho^1 There is no significant knowledge of premarital genotype screening among students of tertiary institutions in Kano State.

Ho^2 There is no significant difference in knowledge of premarital genotype screening among students of tertiary institutions in Kano State based on gender.

Ho^3 There is no significant difference in knowledge of premarital genotype screening among students of tertiary institutions in Kano State based on institution type.

Methodology

The research design adopted for this study was a descriptive research design of cross sectional type. The population of this study comprised students of tertiary institutions in Kano State, with a total population of one hundred and forty six thousand, one hundred and twenty four (146,124). (Academic Directorate Office the Tertiary Institutions 2019). A total of 600 respondents were selected through multi stage sampling technique. The stages are as follows:

Stage 1: Kano Tertiary institutions in Kano State were stratified into universities stratum, colleges of

education stratum and polytechnics/ mono-techniques stratum.

Stage 2: Simple random sampling technique was used to select one tertiary Institution from each stratum that is universities stratum, colleges of education stratum and polytechnics/ mono-techniques stratum.

Stage 3: Proportionate sampling technique of equal distribution was used to determine the number of respondents from each of the selected institutions. The population of each institution was divided by the total population of the three selected institutions of the study and then multiplied by the sample size which was 600.

Stage 4: Availability sampling technique was used to select individual respondents, the process were as follows; the researcher on arrival to each selected institutions personally distributed the questionnaire to the available students found in the institutions irrespective of their level or classes with the help of three (3) research assistants in each institutions.

To determine the content and face validity of the instrument, five (5) copies of the questionnaire were given to five (5) experts in the Department of Human Kinetics and Health Education, Bayero University, Kano. Their corrections, observations, criticism and comments were incorporated into the final draft of the questionnaire to the satisfaction of the supervisor before being administered for pilot study.

To ascertain the reliability of the instrument, a pilot study was conducted using twenty (20) students from Amadu Bello University (ABU) Zaria which was not part of the study area. The Split-half test method was used to determine the reliability of the instrument. After retrieving the administered questionnaire, the items were code 1-20 and split into odd and even numbers. The scores of the two sets (odd and even) were correlated using Spearman's Brown Prophecy Formula and a reliability index of 0.84 was obtained which indicated that the instrument was reliable for usage.

The researcher obtained an introductory letter from the office of Head of Department, Human Kinetics and Health Education, Bayero University, Kano to the Registrar of each selected institutions requesting for permission to conduct the study. The Registrar of each of the selected institutions minute on the letter to various Deans of various faculties who minute on the introduction letters to various HODs where they further introduction the researcher to available Class Reps where the researcher was given room to explain the purpose of the researcher and likely benefits to the participants prior data collection. The researcher administered 600 copies of the questionnaire with the help of three research assistants from each of the ten (10) selected institutions. Three weeks was used in both administering and retrieval of the completed questionnaire. Only 577 questionnaires where duly completed and returned for data analysis.

Descriptive statistics of frequency counts and percentage were used to describe the demographic data of the respondents, while chi-square was used to test hypothesis 1, t- test was used to test hypothesis 2 and Anova to test hypothesis 3 at 0.05 level of significance.

Data Presentation and Discussion of Findings

This study investigated the knowledge of pre-marital sickle genotype screening among students of tertiary institutions in Kano State Nigeria. Six hundred (600) copies of questionnaire were distributed to the respondents, while five hundred and seventy-seven (577) were duly filled and returned and subsequently use for data analysis. The data collected was presented as follows:

Table 1. Demographic Information of the Respondents

Item	Frequency	Percentage (%)
Gender		
Male	294	51.0%
Female	283	49.0%
Total	**577**	**100%**
Age		
16-25	299	51.8%
26-36	251	43.5%
37 and above	27	4.7%
Total	**577**	**100%**
Institutions		
BUK	134	23.2%
Yusuf Maitama	62	10.7%
KUST	58	10.1%
FCE Kano	62	10.7%
Saadatu Rimi	90	15.6%
Legal	14	2.4%
Kano Poly	103	17.9%
Audu Bako	15	2.6%
FCE Bichi	24	4.2%
CAS	15	2.6%
Total	**577**	**100%**

Table 1. shows the demographic information of the respondents. The table reveals that 294 respondents representing 51% were males and 211 respondents equally representing 49.00% were females. This indicated that male participants are higher in number that their female counterparts.

For the age distribution, the data reveals that respondents within ages range of 16– 25 were 299 (51.8%), ages 26 – 36 were 251 representing 43.5% and 37 years – above were 27 representing 4.7% of the total respondents. This means that the majority of the participants fall between the age ranges 16 – 25 years old. From the table, respondents from BUK were 134 representing 23.2%, Yusuf Maitama 62 representing 10.7%, KUT 58 representing 10.1%, followed by FCE Kano 62 representing 62 representing 10.7%, is Saadatu Rimi 90 representing 15.6%, while Legal 14, (2.4%) Kano Poly second largest 103, Audu Bako 15, FCE Bichi 24 and CAS 15 which represents 2.4%, 17.9%, 2.6%, 4.2%, 2.6% respectively. The table reveals that the majority of the respondents are from BUK followed by Kano Poly Tech.

Hypothesis One

There is no significant knowledge of premarital genotype screening among students of tertiary institutions in Kano State.

Table 1.2 Chi Square Summary on student's knowledge of premarital genotype screening

Knowledge	Agree	Disagree	Total	df	χ^2 Value	Probability
FO	556	21	577	1	496.067	.001
FE	288.5	288.5				

Table 1.2 shows that (556) (96.3%) have the knowledge of premarital genotype screening while (21) (3.7%) do not have knowledge of pre-marital genotype screening. The table indicated that the number of respondents that responded in agreement is higher than those that responded against knowledge of pre-marital genotype screening. Statistical computation indicated Chi Square value of 496.067 df 1 and, P < .05 as a result of this the null hypothesis is therefore rejected, due to P-value is less than 0.05 level of significance, which indicated that tertiary institutions students have significant knowledge of premarital genotype screening. The researcher of the opinion that having knowledge of premarital genotype screening among tertiary institutions students can take place formally or informally; because on normal circumstance students can receive same home orientation by taken them to hospital to be test them on their genotype status or come across the topic in the course of their studies or while having friendly chart with friends.

Hypothesis two

There is no significant difference in the knowledge of premarital genotype screening among students of tertiary institutions in Kano State based on gender.

Table 1.3 Summary of independent on student's knowledge of premarital genotype screening based on gender

Knowledge	Gender	N	mean	Std	Std	t	df	PDeviation	Error mean
	Male	294	29.08	4.069	.237	1.985	575	.089	
	Female	283	29.69	4.448	.264				

t = 1.985, df 575, (P > 0.05)

Table 1.3 revealed that mean score between males and females is 29.08 and 29.69 respectively while S of 4.069 and 4.448 for both males and females, df 575, t cal value of 1.985 P> 0.05 for male and female students on difference on knowledge of pre-marital genotype screening. Since the calculated t- value of 1.985 is greater than P >0.05 level of significance, the null hypothesis which stated there is no significant difference in the knowledge of premarital genotype screening among students of tertiary institutions based on gender was therefore accepted. This implies that there is no significant difference on knowledge of premarital genotype screening among students base on gender. The outcome is not surprising to the researcher because on normal circumstance both males and females received same home orientation regardless of gender, is the opinion the researcher that either of the gender can be knowledgeable depending on their parental background.

Hypothesis Three

There is no significant difference in the knowledge of premarital genotype screening among students of tertiary institutions in Kano State base on institutions type.

Table 1.4 ANOVA summary on knowledge of premarital genotype screening based on institutions type

Knowledge	Sum of Squares	df	Mean Square	F	Sig
Between groups	4178.5539	464.284	41.756	0.01	
Within Groups	6303.083	567	11.117		
Total	10481.636576				

F= 41.75,576, (p<0.05)

Table 1.4 shows ANOVA result on differences of knowledge on pre-marital genotype screening among students of tertiary in Kano State base on institutions type. Statistical analysis indicated that F =41.756, P < 0.05. Therefore, the null hypothesis is rejected, on the account that significant difference exists among students on knowledge on pre-marital genotype screening based on institutions type. Certainly, the researcher is the opinion that significant different existed due socio- economic background of individual students, one can hardly rule out the possibilities of some students having age over their colleagues on having the knowledge of pre-marital genotype screening as a result of being taken to hospital for such screening. In order to asc ertain the direction of significant differences of knowledge on pre- marital genotype screening among students of tertiary in Kano State base on institutions type; Scheffe Post Hoc test was conducted. Due to size and nature of the Post hoc tables only the interpretation was as presented.

Post Hoc Tests

It was reveals that significant differences exist when comparing BUK with other tertiary institutions, BUK differed more significantly with Yusuf Maitama Sule University Kano (YUMSUK), than Kano State University of Science and Technology (KUST), Federal College of Education (FCE) Kano, Sa'adatu Rimi College of Education Kumbotso, Aminu Kano College of Islamic and Legal Studies Kano, Audum Bako College of Agriculture (Danbatta), Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS) on knowledge of pre-marital genotype screening among students of tertiary in Kano State.

While comparing Yusuf Maitama Sule University Kano on knowledge of pre- marital genotype screening; it was reveals that significant differences exist when compared with BUK after Post Hoc test, followed by Kano State University of Science and Technology (KUST), Kano State Polytechnic and Federal College of Education (FCE). Moreover no difference existed between Federal College of Education (FCE) Kano, Sa'adatu Rimi College of Education Kumbotso, Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture (Danbatta), Technical Bichi and Kano College of Art and Remedial Studies (CARS).

It was found Kano State University of Science and Technology (KUST) differs in knowledge of premarital genotype screening with BUK, more than Yusuf Maitama Sule University Kano (YUMSUK), Sa'adatu Rimi College of Education Kumbotso and Kano State Polytechnic, while Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture (Danbatta),

Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS), Federal College of Education (FCE) Kano.

Federal College of Education (FCE) Kano differs more on knowledge of pre-marital genotype screening with BUK more than Aminu Kano College of Islamic and Legal Studies Kano. While no differences exist with Yusuf Maitama Sule University Kano (YUMSUK), Kano State University of Science and Technology (KUST), Sa'adatu Rimi College of Education Kumbotso, Audu Bako College of Agriculture (Danbatta), Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS).

On the differences on knowledge of premarital genotype screening among institutions; Sa'adatu Rimi College of Education Kumbotso differed more on knowledge of pre-marital genotype screening with BUK, more than Kano State University of Science and Technology (KUST), Kano State Polytechnic and Federal College of Education (FCE) Technical Bichi. While no differences existed with Yusuf Maitama Sule University Kano (YUMSUK), Federal College of Education (FCE) Kano, Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture (Danbatta), Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS).

Aminu Kano College of Islamic and Legal Studies Kano after the Post Hoc test on knowledge of pre-marital genotype screening differs more with BUK and Kano State Polytechnic while no differences existed between Yusuf Maitama Sule University Kano (YUMSUK), Kano State University of Science and Technology (KUST), Federal College of Education (FCE) Kano, Sa'adatu Rimi College of Education Kumbotso, Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture (Danbatta), Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS).

Kano State Polytechnic on knowledge of pre-marital genotype screening among institutions after Post Hoc test differs with all institutions except BUK and Kano College of Art and Remedial Studies (CARS). By implication this is an indication that Kano State Polytechnic sharing equal knowledge of premarital genotype screening except BUK and Kano College of Art and Remedial Studies (CARS).

Audu Bako College of Agriculture difference on knowledge of pre-marital genotype screening with Yusuf Maitama Sule University Kano (YUMSUK), Kano State University of Science and Technology (KUST), Federal College of Education (FCE) Kano, Sa'adatu Rimi College of Education Kumbotso, Aminu Kano College of Islamic and Legal Studies Kano, Federal College of Education (FCE) Technical Bichi and Kano College of Art and Remedial Studies (CARS).

Federal College of Education (FCE) Technical Bichi after Post Hoc test on knowledge differences among institutions. Differences existed with BUK, Yusuf Maitama Sule University Kano (YUMSUK), Sa'adatu Rimi College of Education Kumbotso and Kano State Polytechnic, while no differences existed with Kano State University of Science and Technology (KUST), Federal College of Education (FCE) Kano, Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture and Kano College of Art and Remedial Studies (CARS).

On the other hand, Kano College of Art and Remedial Studies (CARS) after the Post Hoc test it was found that differences exist on knowledge of pre-marital genotype

screening among institutions with BUK and Kano State Polytechnic. Also no differences existed with Yusuf Maitama Sule University Kano (YUMSUK), Kano State University of Science and Technology (KUST), Federal College of Education (FCE) Kano, Sa'adatu Rimi College of Education Kumbotso, Aminu Kano College of Islamic and Legal Studies Kano, Audu Bako College of Agriculture (Danbatta) and Federal College of Education (FCE) Technical Bichi.

Discussion of Findings

The findings of hypothesis one of this study revealed that, there is significant knowledge of premarital sickle cell disease among students of tertiary institutions in Kano State. This finding is in accordance with Oyedele and Emmanuel (2015) in a study on awareness and acceptance of premarital genotype screening among youths in a Nigerian community. The majority of the respondents a aware of premarital genotype screening. The relationship between awareness and acceptance of premarital genotype screening is statistically significant. Also the findings is in agreement with the study of Isah et al., (2010) who study on knowledge and attitude regarding premarital screening for sickle cell disease among students of State School of Nursing Sokoto, they reported majority of respondents have knowledge on sickle cell disease and also knew their genotype status. The finding of this study is equally in agreement with study of Gharaibe and Mater (2009) who studies on attitude, knowledge and perception to premarital sickle cell screening among young Syrian adults in Jordan. Their findings showed that although the students had a considerable knowledge of premarital screening, they had a limited knowledge about certain aspects. Although they had some positive attitude and will like to go for premarital screening, the students still had negative attitude and perception towards other aspects of premarital counseling and testing.

This study gains the support of Ibrahim et al., (2010) who assessed knowledge and attitude of female students in king Abdul- Aziz University towards premarital screening, the result showed that the students' knowledge about the program was generally low before educational campaign. After the educational program, student's knowledge about premarital screening was markedly improved. The mean student knowledge score was 9.85 plus or minus 5.36 in pre-test and improved to 18.45 plus or minus 14.96 in the posttest with highly statistical significance difference. This implies that educational program could be successful in improving student's knowledge about premarital sickle cell screening.

The findings of hypothesis two revealed that there is no significant difference on knowledge of premarital genotype screening among students of tertiary institutions in Kano State base on gender. This finding is in accordance with Samson, (2021) who study on demographic impact on knowledge, awareness and acceptance of premarital genotype screening among youths in a Oyo South Nigerian. The outcome indicates no significant difference base on gender difference among the participants. This is obvious as observed by the researcher that either male or female should not be are factor in determining in accepting or otherwise, because only circumstance can determine acceptability or otherwise of given situation. This finding contradicted the study conducted by Adeyemo, Omidiji, & Shabi, (2007) on the attitude towards premarital genetic screening among students of Osun State polytechnic, who revealed that male students of the institutions have more knowledge about premarital screening than female students of the same institution.

This finding contradicted the study conducted by Adeyemo, Omidiji, & Shabi, (2007) on the attitude towards premarital genetic screening among students of Osun State polytechnic, who revealed that male students of the institutions have more knowledge about premarital screening than female students of the same

institution. The outcome is not surprising to the researcher because on normal circumstance both males and females received same home orientation regardless of gender, is the opinion the researcher that either of the gender can be knowledgeable depending on their parental background.

The findings of hypothesis three revealed significant difference on knowledge on pre-marital genotype screening based on institutions type among students of tertiary institutions in Kano State. In agreement to this finding of AlKindi et al., (2012) on knowledge and attitude of university students of Sultanate of Oman and Osman Bin Osman University towards premarital sickle cell program. The result shows that majority of the students from different institutions were knowledgeable about the availability of premarital screening and thought that it is important to carry out premarital sickle cell screening, however majority of those that have heard about it heard it in schools/college, this is followed by media but its utilization among students is still very low due to different believes of the students. On the other hand, Adenike et al., (2018) conducted research on knowledge of sickle cell disease and pre- marital genotype screening among students of tertiary educational institutions in South Western Nigeria. The results revealed that most participants were knowledgeable about SCD and have heard about sickle cell disease through the media. Students perceived benefits of premarital genotype screening was good as most participants affirmed that genotype screening for intending couples will prevent unnecessary worries about given birth to a child with SCD and confirm their blood compatibility in a bid to take informed decision about marriage. Moronkola and Fadairo (2009) conducted a study on the knowledge and attitude of university students in Nigeria towards sickle cell disease and genetic counseling before marriage. The findings showed that majority of the respondents (63.3%) knew their genotype, had a high knowledge about sickle cell screening, knew the benefit of sickle genetic counseling, and had a positive attitude towards sickle cell screening and access to genetic counseling, especially for students in tertiary institutions of Nigeria and elsewhere in Africa.

Certainly, the researcher is the opinion that significant different existed due socio-economic background of individual students, one can hardly rule out the possibilities of some students having age over their colleagues on having the knowledge of pre-marital genotype screening as a result of being tak en to hospital for such screening. In order t o ascertain the direction of significant diffe rences of knowledge on premarital genoty pe screening among students of tertiary in Kano State base on institutions type; Scheffe Post Hoc test was conducted. Due to size and nature of the Post hoc tables only the interpretation was as presented.

Major findings revealed that:

1. Tertiary institutions students have significant knowledge of premarital genotype screening
2. There is no significant difference on knowledge of premarital genotype screening among students based on gender
3. There is significant difference on knowledge of pre-marital genotype screening based on institutions type

4. Conclusions

Based on the findings of this study the following conclusions were drawn:

1. Kano State tertiary institutions students have knowledge of premarital genotype screening.
2. Knowledge of premarital genotype screening among Kano State tertiary institutions students do not differ on base on gender.

3. There is difference on knowledge of pre-marital genotype screening among Kano State tertiary institutions students based on institutions type.

Recommendations

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

1. The existing trends on knowledge of premarital genotype screening among students of tertiary in Kano State should be maintained so that in feature children with genotype problem can be reduced.

2. University management in collaboration with health practitioners in the university Health Unit should make genotype screening mandatory for all new intake students prior to admission in other to know their status.

2. Management of all institutions within Kano State in collaboration with General Studies Unit (GSU), should include Communicable and Non Communicable Diseases courses among other GSUs courses to give new students the opportunity to have firsthand information on the adverse effects concerning genotype screening among couples and alike.

3. Seminars and workshops should be organized by stakeholders on regular bases for both new and returning students by various faculties to sensitize them on currents trend concerning various testing particularly genotype screening and their importance for the well-being of intending couples in particular and the society at large.

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Unlocking Entrepreneurship Opportunities through the Transformative Management of Sport Arenas in Kano Metropolis

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Abstract

The study assessed the unlocking entrepreneurship opportunities through the transformative management of sports arena in Kano metropolis. Two research questions were raised and two hypotheses were formulated to guide the study. Descriptive survey was used; with a population of 1,050 random sampling technique was employed to selected Physical and Health Education (PHE) graduates as participants from 22 sports arenas in Kano metropolis. Total of 211 participants duly filled and retrieved; frequency count percentage was used for demographic information of the participants while chi-square (χ^2) was used for the analysis of two tested hypotheses under degree of freedom (df) of 210 at 0.05 level of significance. The findings revealed that PHE graduates roles of PHE graduates in sports arenas has $\chi^2 = 152.011$, The possible ways for improving PHE graduates in sports arenas in Kano metropolis with $\chi^2 = 199.111$.The study concluded that PHE graduates unlocking, managing, training and improving the standard of sports arenas in Kano metropolis. Training and re-training and motivations needs to be given to PHE graduates in order to manage sports arenas effectively.

Keyword**:** *entrepreneurship,* management, unlocking opportunities & sports arenas

Background to the study and Review of Related Literature

Sports are governed by a set of rules or procedures which serve to ensure fairness and satisfactory participation in determining the winner (Yusuf, 2018). Madaki & Gero, (2022), stated that sport management can be defined as activities which are intended towards development of sports carried out by specific trained people. Sports is one of the lucrative and source of income to many people all over the world. Government and private individuals are highly engaged in physicalx activities due to either health reasons, leisure and some for business venture. Rasheed & Oyinlola, (2014), pointed out that job opportunities after the completion of entrepreneurial education and training will offer graduates to have successful business after obtaining obligatory qualification.

Sophy, (2021), defined sport-based entrepreneurship as any form of enterprise or entrepreneurship in sport context and enumerated sport viewing centre, Betting, Gym and fitness centres as some of the sport-based entrepreneurial skills. Creating sports arenas in Kano Metropolis is one of the visualized businesses in almost eight metropolis Local Government Area (LGA) of Kano even some major settlements in the remaining thirty-six LGAs headquarters are also benefiting with this newly business of building sports arenas or centres in their localities in Kano state. This business potential was engaging various professionals in building, vegetation decoration, iron welding, and security agents and sports instructors/coaches. The managing of this business ventures would definitely require well trained and skillful individuals in various fields including physical and health educators.

Green (2020) stated that popularity in sporting events has increased significantly all over due to its entrepreneurial benefits especially among youths through Olympic games, World Cups Nations Leagues. Also the world is experiencing

improvement in sports as a result of information communication and technology and global infrastructure which dominated by youths including Kano (Yazid, 2023). Participation in physical activity has a contributions toward enrichment of human personality specifically mental, social growth and longevity, PHE graduates can impact their knowledge and experience toward make sports arenas in Kano as (Willet, Dietz, & Colditz, 2010). The researchers observed the roles that PHE graduate in today's unlocking opportunities toward using their experiences in sports arenas in Kano metropolis. Belissent, (2017), stated new technology and experiences revolutionized the way many sports are played and relatively new concepts known as the science of sport, which implies the use of science to improve, not only performance of athletes but other aspects of sports.

Kano metropolis which comprises of eight LGAs; Kano Municipal, Dala, Gwale, Fagge, Kumbotso, Tarauni and Ungogo. These local governments provided the large population portion in Kano state this led to teaming population serve the metropolis as business attractive to many individuals from within Nigeria and other countries. Insecurity of book haram, kidnapping in North-East, North-West and other geographical regions of Nigeria makes Kano as a second homes for many people as at now *Kanawa* (people of Kano) are very humble and hospitality led the state to be known as Centre of Commerce of Nigeria, sports activities were included. With this in mind, the researchers investigated business potentials and tapping in the management of sports arenas in Kano Metropolis.

Business entrepreneurship refers to any act, skills or services executed in the society in order to have payment as incomes towards way for survival and enjoyment. Yakasai, (2017), explain sport gather millions of people through organizations, clubs, associations, business companies and events which contribute to the economic and social development of communities around the world. On the other hand, Ohakwe, (2001), sort sport to be all forms of physical activities that contribute to physical fitness, intellectual and economic wellbeing; as well as social interaction, such as play, recreation, organized or competitive sport, indigenous sports and games. Professionalism has come to stay in sports, athletes/players substantially exceed those paid to average salaries earners in most countries of the world (Iember, 2017). Physical and Health Education graduates employed and their roles in the managing sports arenas in Kano Metropolis with the purpose of recommending ways forward in managing of sports arenas in Kano Metropolis.

Research Questions

The following questions were used to guide the study;

1. Do PHE graduates play any significant roles in sport arenas in Kano Metropolis?
2. What are the possible ways for improving PHE graduates in managing sports arena?

Hypotheses

1. Physical and Health Education graduate do not play any significance roles in sports arenas in Kano Metropolis
2. There are no possible ways for improving Physical and Health Education graduates to manage sports arenas in Kano Metropolis

Methodology

Survey type of descriptive design was used for this study, twenty two (22) sport arenas were selected from eight (8) Local Government Areas makes Kano Metropolis; the study was delimited to only physical and health education (PHE) graduates opportune to secure jobs in sports arenas in Ahmed Musa Sport Centre Hotoro, Azman Sport Centre, BC Sport Centre, Maracana City Centre Gadon- Kaya, Aliyos Arena Kurna, Saifullahi Square Rijiyar-Zaki, Sarina

Sport Event, Dan Nagari Sport Centre, Girma Arena North-West Road, Senior Staff Recreation Centre BUK, Mai-Yari Arena, Next Door Sports Tudu-Yola, Emirate Sports Centre Kofar Ruwa, La Sultan Arena Ahmadu Bello Way, Copral Arena Magajin-Rumfa, Dankano Sport Centre Mundubawa, Bonny Boger Arena Katsina Road, Branford College Sport Centre, A. Shanono Markas Arena, Royal Arena Danbare, Suleiman Sports Centre and Mahaha Sports Complex these centres were used to represent the entire Kano Metropolis which has the population of 1,057 sports arenas works in Kano Metropolis, 230 respondents were selected as sampled of the study representing 20% of the population. This would enable the researchers to ascertain the roles of PHE graduates in sports arenas in Kano Metropolis. A researcher developed questionnaire was used with modified 4-likert scale. Instrument was distributed by the researcher and four research assistants and exercise last for two weeks was used for data collection from the 22 selected arenas in the Kano Metropolis. Frequency percentage was used and analyze the demographic information of the respondents while chi-square (χ^2) was used to analyze the four (4) formulated hypotheses all under 0.05 level of significance.

Data Presentation and Analysis

Table 1: Demographic information

Variable	Frequency	Percentage
Age		
20 – 25 yrs	54	25.6%
26 – 30 yrs	123	58.3%
31 yrs and above	34	16.1%
Total	**211**	**100%**
Gender		
Male	189	89.6%
Female	22	10.4%
Total	**211**	**100%**
Qualification		
Degree and above	56	26.5%
NCE/ND	132	62.6%
SSCE/NECO	23	10.9%
Total	**211**	**100%**
Type of service		
Instructor	50	23.7%
Coach	42	19.9%
Athletes	90	42.7%
Non-professional	29	13.7%
Total	**211**	**100%**

Table 1 reveals that Two hundred and eleven (211) questionnaires were duly filled and retrieved for the analysis. The data gathered revealed that 54(25.6%) were within the age of 20 – 25yrs, 123(58.3%) are in the age group of 26 – 30yrs, while 34(16.1%) are within the aged of 31yrs and above. On the gender of the respondents, 189(89.6%) are male while 22(10.5%) are female. Educational qualification of the respondents, 56(26.5%) are degree graduates, 132(62.6%) are NCE/ND holders, remaining respondents SSCE/NECO were 23(10.9%)

Types of services respondents, 50(23.7%) were instructors, 42(19.9%) were coaches, 90(42.7%) were athletes, lastly, 29(13.7%) were non-professionals making the total of 211(100%) respondents in the sports arenas in Kano Metropolis.

Hypothesis I: PHE graduates do not play any significance roles in sports arenas in Kano Metropolis

Table 2: χ^2 Summary on the opinion of participants on roles of PHE graduates in sports arenas in Kano Metropolis.

Variable	Agree	Disagree	Total	df	χ^2	P-value
FO	174	37	211	210	152.011	.001
FE	105.5	105.5				

χ^2 = 152.011; df 210, (P<0.05)

Table 2: shows that 174(82.5%) participants agreed and 37(17.5%) disagreed that PHE graduates are not playing any significance roles in sports arenas in Kano Metropolis. The statistical analysis indicated chi-square (χ^2) value of 152.011 at df 210, (P<0.05). This means that the null hypothesis tested was rejected on the account that majority of the participants in the study area have the opinions that PHE graduates are playing very significance roles in sports arenas in Kano Metropolis.

Hypothesis II: There are no possible ways for improving PHE graduates to manage sports arenas in Kano Metropolis.

Table 3: χ^2 Summary on the opinion of participants on possible ways for improving PHE graduates in managing sports arenas in Kano Metropolis.

Variable	Agree	Disagree	Total	df	χ^2	P-value
FO	150	61	211	210	199.111	.001
FE	105.5	105.5				

χ^2 = 199.111; df 210, (P<0.05)

Table 3: shows that 150(71.1%) participants agreed and 61(28.9%) disagreed that there are no possible ways for physical and health education graduates in managing sports arenas in Kano Metropolis. The statistical analysis indicated chi-square (χ^2) value of 199.111 at df 210, (P<0.05). This means that the null hypothesis tested was rejected on the account that majority of the participants in the study have the opinions that there are possible ways that physical and health education graduates can be improved in managing sports arenas in Kano Metropolis.

Discussion of Finding

The study unlocking entrepreneurship opportunities through the transformative management of sports arena in Kano Metropolis. The findings revealed that sports arenas in Kano Metropolis are one of the entrepreneurial businesses were physical and health education graduates are able to participated

and play their role in sports arenas supported by Sylvester and Yazid, (2023), opined that sports arenas needs to use digital technologies and PHE graduates to work in sports arenas for sustaining the income and engage toward entrepreneurship.

Findings on role of physical and health education graduates in sports arenas, revealed that PHE graduates contributed their quota in sports arenas in Kano Metropolis with maximum percentage as indicated by the chi- square calculated this was in line with Yazid, (2023), stated how today's digital technology in sports can be used to organize and manage information serves as roles put in place by PHE graduates in managing the standard use of sports arenas. Also including sophisticated equipment in sports arenas same with Kolar, Andreff & Bednarik, (2014), has the opinion of using tools in day-to-day operation of sports organization events PHE graduate may also contribute more in sports.

Study finding reveals that, degree and NCE/Diploma in physical and health education should adopts possible ways in managing sports arenas such as exposed to use training and re-training on using new sports equipment in sports arenas, also motivational approaches should be giving to them including financial and commendation letter I order to improve and put their best toward working in sports arenas in Kano Metropolis this was supported by Sara, (2021), suggested that social and mental images should improve and developed towards the development of other desirable habit in the community and the nation. Addition to that, Madaki & Gero, (2022), suggested that sports management need to have a well-trained people and endeavor to planned and coordinate sports programmes towards intended objectives.

Conclusion

Based on the key findings this study it is concluded that Physical and Health Education graduates are unlocking opportunities in sports, managing, training athletes in sports and improving possible ways in arenas in Kano Metropolis through impacting their experiences and technological know- how. The study highlighted the major areas that PHE graduates may explore unlocking entrepreneurial businesses in Kano metropolis.

Recommendations

Based on the conclusions of the study the followings recommendations are raised:

1. Physical and health education graduates should maintain in playing vital roles in unlocking entrepreneurship opportunities in sports arenas in Kano Metropolis
2. Commendations letter, financial rewards and workshop should be conducted to physical and health education graduates in order to explore more entrepreneurship opportunities in managing of sports arenas in Kano Metropolis

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Influence of Teacher Training in Test Administration Competence in Kano Municipal Educational Directorate, Kano State, Nigeria

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Abstract

This study assessed influence of teacher training on competence in test administration. It was guided by two objectives on the basis of which a research question was posed and answered and one hypothesis was formulated and tested at a 0.05 level of significance. The study used survey research design. The population comprised of all the 1,082 teachers across 33 public Senior secondary school in Kano Municipal Educational Directorate, Kano State. Through cluster sampling technique, a sample of two hundred and seventy-eight (278) was drawn. The data generation instrument was a re-validated "Teachers' Test Administration Competence Scale" with a coefficient stability of 0.6. Descriptive statistics in the form of frequency count, simple percentage and t-test for independent sample were the statistical tools used for the analysis of data. Simple percentage and frequency count were used to answer the research question and t-test for independent sample was used for testing the null hypothesis. The result of the study showed that 77% of senior secondary school teachers in Kano Municipal Educational Directorate, Kano State were less competent in test administration. The findings revealed that trained and untrained teachers do not significantly differ in test administration competence. From the findings, it was concluded that the identified problems were because majority of the teachers (i.e. 77%) were less competent in test administration. Furthermore, competence in test administration was not a function of training. Based on the findings, it was recommended that there is need for stakeholders in Kano Municipal Educational Directorate, Kano State, to device the means through organizing workshop, seminar and conferences so that teachers would acqure the pre-requisite knwoeldge and skills for test administration

***Keywords*:** *Teacher Training,* Competence, Test Administration, Educational Assessment, Assessment Literacy

Introduction

One way of assessing students' learning outcome is the use of achievement tests. In such tests, the students are given a number of tasks to do under specific conditions. A test as a standard procedure for obtaining a sample of behaviour from a specified domain. In schools, the domain is usually classroom learning which is assessed with achievement tests. Such tests are either standardized or non-standardized (also known as teacher-made). A classroom teacher is expected to be competent in test administration. This aspect of the testing process has to do with presenting tasks to examinees and requiring them to perform in order to ascertain the degree to which they have learnt during the teaching and learning process.

Educational assessment serves as a systematic process for collecting and interpreting evidence about learners' knowledge, skills, attitudes, and values. It informs instructional decisions, supports learning, and ensures accountability. In this process, teachers serve as both facilitators and gatekeepers of assessment quality. Test administration, a core component of assessment, involves planning, conducting, and scoring assessments in a manner that ensures fairness, reliability, and validity. Teacher competence in this domain is shaped significantly by the quality and scope of their professional training. Test administration procedure is as important as the process of constructing the test. This is because the validity and reliability of a test score can be greatly tempered with when the test was poorly administered.

When test administrators were not conversant with the principles of test administration, the overall aim of examination process was defeated. Competence in test administration encompasses a set of knowledge, skills, and dispositions that enable teachers to plan, administer, and interpret assessments effectively. According to the Standards for Educational and Psychological Testing (AERA, APA, & NCME, 2014), assessment competence involves understanding test purposes, following standardised administration procedures, and accurately interpreting results. Teacher training programmes vary in their coverage of assessment literacy. While some provide extensive modules on testing principles, others offer minimal exposure, leaving teachers ill-prepared for practical administration challenges. Studies (e.g., Popham, 2011; Mertler, 2017) have shown that targeted professional development significantly improves teachers' ability to implement standardised test protocols, reduce bias, and uphold ethical standards in assessment. Competence is a widely used term in the field of education that shows appropriate prior knowledge, skills, attitudes, and abilities in a given context, that adjusts and develops with time and needs in order to effectively and efficiently accomplished a task and that are measured against a minimum standard. Competency in teaching can be seen as the ability to exhibit on the job skills and knowledge and gain as a result of training. These skills and knowledge prescribed in the training programmed are apparently calculated by the curriculum planners that relate to be instrumental to achievement of the desired objectives unfortunately not. Furthermore, teachers' competence is specified by standard for educational assessment of students through the quality of test question that depends on the quality of the teacher. From the forgoing, competence is a variety of knowledge, information, skills, abilities, capabilities, attitude that make a person able to get adjustment in job and perform well in his job by utilizing his knowledge and skills effectively to achieve school goals and objectives. Competence indicates sufficiency of knowledge and skills to enable the person to act in a various situation by using that knowledge efficiently to complete the requirements of his/her job or career. Teachers' competence in test administration can be regarded as a variety of knowledge, information, skills, abilities, capabilities and right attitude possessed by teacher toward administering tests.

Therefore, to administer a good test, classroom teachers should possess the competence for giving clear directions on how the test should be administered. It is worth noting that the competence is affected by teachers' characteristics such as their educational background, qualification, working experience, discipline and gender (Morayo and Ohia, 2014; Alice et al., 2010; & Darazo, 2017). It is against this background that, the study investigated the influence of teacher training competence in test administration in Kano Municipal Educational Directorate, Kano State.

Concept of Test Administration

Test administration is the process by which a test taker completes a test. It is a combination of the activities that start prior to the actual test taking process and extend beyond the immediate testing environment. According to Fulcher (2010) stated that when the process of test administration is elaborated in the testing related texts, the only concern is delivery system which is usually associated with test taking process or the physical environment. In view of Roshan (2016) test administration is a variety of procedures for giving a test to an individual or a group of persons and also for gathering empirical information in order to assess the qualities of test usefulness and make inferences about test takers' abilities. Although Festus (2014) found out that teachers lack the knowledge of good test

administration, some studies showed otherwise. These found out that majority of secondary school teachers were competent in test administration. For example, Sani (2019), Mamman (2023) and Morayo (2014) found out 70% of senior secondary school teachers in Kano State, 86.4% of junior secondary school teachers in Daura Educational Zone and 94.7% of senior secondary school teachers in Ekiti State, respectively, were competent in administration. Even though majority of the teachers were found to be competent in test administration, they differed in some respects. They differed in the competence by teacher training, work experience and level of teaching qualifications (Mamman, 2023) but did not differ by gender and teacher training (Muhammad, 2017).

However, Test administration procedures were developed for a test in order to help reduce measurement error and to increase the likelihood of fair, valid and reliable assessment. The appropriate standardized procedures will improve measurement by increasing consistency and test security. The consistent standardized administration of exam will allow the teacher to make direct comparisons between examinees scores, despite the fact that the examinees may have taken their test on different dates, at different siting and with different proctors. Furthermore, administration procedures that protect the security of the test help to maintain the meaning and integrity of the scale for all examinees (Sani, 2019). Therefore, to administer a better test, the administrator should control the extraneous variables. These variables can be considered as any factors that affect test scores which are not related to what the test is intended to measure (Fulcher, 2010). In administering test, it is difficult to eliminate the whole extraneous sources of variation, because it is not simple to control all variables (Fulcher, 2010). Instead of this procedure, it is helpful to keep them constant. This increases the chances for test takers to carry out the best of their abilities, and minimizes the opportunity for distraction or cheating.

Test Administration Methods

The mode of test administration is an essential consideration of a testing program. There are few simple answers in the process of determining which method to use. Some might be able to fully utilize advanced methods such as Computer Based Testing (CBT), while others might be better served by traditional Paper and Pencil Testing (PPT) even if they have the sample size for advanced methods (Nathan, 2008). Therefore, test administration can be divided into three methods that administrators are familiar with: Live performance testing, paper and pencil testing and computer-based testing (Folk, March & Hurst, 2006). Paper and Pencil Testing and Performance Testing (PPT & PT) have existed for millennia. Computer – Based Testing (CBT), on the other hand, has obviously existed only since the advent of computers, and was not common until the availability of personal computers made it economically feasible. (Pucel & Anderson, 2003).

Competent Teacher

A competent teacher is one who is versatile in nature and possesses varieties of knowledge, abilities, skills, techniques and can effectively apply them on the basis of the requirement in his job and his students' while showing significant performance and progress in achievement of tests. The competent teacher is one who effectively accomplishes a task (instruct) in a given context (in classroom) using appropriate knowledge, skills, attitudes and abilities that have adjusted and developed with time and needs (Nadeem, 2011). According to Arshad (2007) competent teacher is he who has depth knowledge of subject matter, good verbal and no-verbal communication skills, complete work within time, initiative, take appropriate decisions, get adjustment in every situation, believe in research cooperative attitude towards pupils, colleagues, parent and

administration".

There was growing concern regarding test administration competence among teachers As reported by Sani (2019) where it was revealed that very few teachers in Kano State were competent in test administration. As a consequence, students' academic performance was affected. In addition, from the researcher's personal experience, senior secondary school teachers in Kano Municipal Educational Directorate, Kano State, used to cause distractions during test administrations. Some of them used to beat, insult and harass their students. As a result, some students cry. This unfortunate situation distracts the attention, concentration, mindset and interest of the students to continue writing the test/exam properly and efficiently. As would be expected, this rude behavior of teachers may affect the students' scores and performance. Based on this problem, this sought to achieve two objectives. To find out (i) the proportion of test administration competent and less competent senior secondary schools' teachers in Kano Municipal Educational Directorate, Kano State and (ii) whether or not trained and untrained teachers differ in test administration competence.

Data Presentation and Analysis Research Question: What is the proportion of test administration-competent and less-competent senior secondary school teachers in Kano Municipal Educational Directorate, Kano State?

Research Question and Hypothesis

The study answered the following one research question and one null hypotheses were formulated and tested at α 0.05 level of significance.

1. What is the proportion of competent and less competent teachers in test administration among senior secondary schools' teachers in Kano Municipal Educational Directorate, Kano State?
2. Ho1: There is no significant difference in test administration competence mean score of trained and untrained senior secondary schools' teachers in Kano Municipal Educational Directorate, Kano State.

Methodology

The study used survey research design. From a population of one thousand and eighty-two (1,082) public senior secondary school teachers in Kano Municipal Educational Directorate, Kano State, a sample of two hundred and seventy-eight (278) was drawn through cluster sampling technique. The data generation instrument was a re-validated "Teachers' Test Administration Competence Scale" with a coefficient stability of 0.6. Simple percentage and frequency count were used to answer the research question and t-test for independent sample to test the hypothesis

Table 1: Proportion of Teachers' Competence in Test Administration

Proportion	N	Percentage (%)
Less competent	214	77
Competent	64	23
Total	**278**	**100**

Source: Field Work, 2023

Figure 1 shows the proportion of senior secondary school teacher's competence in test administration. From the figure it is clear that secondary school teachers were less- competent in test administration having a total number of two hundred and fourteen (214) respondents representing 77%, scored 0 – 63 marks, while sixty-four respondents representing 23% scored between 64 – 126 marks in the scoring instrument.

Hypothesis Testing

It is hypothesized that "There is no significant mean difference in test administration competence between trained and untrained senior secondary school teachers in Kano Municipal Educational Directorate, Kano State". The hypothesis was tested at a 0.05 level of significance using t-test for independent samples. The result is given in the table below.

Table 2: T-test for Independent Sample in Teachers' Competence in Test Administration by Teacher Training.

Teacher Training	N	Mean	SD	t.cal.	df	P-value (2-tailed)
Trained	230	1.77		-.395	276	.693
Untrained	48	1.79	.410			

Sig. at P ≤ 0.05

The table shows that the trained and the untrained teachers are 230 and 48, respectively. Moreover, it shows that, in terms of test administration competence, the trained and untrained teachers have mean scores of 1.77 and 1.79, and SD of 0.425 and 0.410, respectively. The SDs indicate that the two distributions are not much different in terms of dispersion. The table further shows that the statistical comparison of the two means yields a calculated t-value of -0.395 and a p-value of 0.693 at a 0.05 level of significance with degree of freedom of 276. The p-value is greater than the level of significance (0.693 > 0.05). According to Jangir et al., (2024) when this happens, the null hypothesis is accepted. This means that a significance difference is not observed in teachers' test administration competence between trained and untrained teachers. Thus, the finding reveals that training does not influence teachers test administration competence in Kano Municipal Educational Directorate, Kano State.

Discussions on Findings

In respect of the research question relating to proportion of test administration competent and less competent teachers in Kano Municipal Educational Directorate, the study revealed that 23% (representing 64 teachers) and 77% (representing 214 teachers) were competent and less competent, respectively, in test administration. This finding is in agreement with Festus (2014) who found that teachers lack the knowledge of good test administration. However, the finding disagrees with the finding of Morayo (2014) that most of the teachers in his study were competent (i.e. they followed good test administration procedures. It is also in disagreement with Muhammad (2017) who found that 85% of senior secondary school teachers possessed the knowledge on test administration. Similarly, the finding is in disagreement with the findings of the study Sani (2019) who discovered that 240 (representing 70%) senior secondary school teachers were competent in test administration. The second finding of the study reveals that training does not influence teacher test administration competence. The finding is in agreement with findings of Muhammad (2017) who similarly found no significant difference in test administration competence among teachers with different levels of professional training (trained and untrained teachers). But it is in conflict with the findings of Sani (2019) and Mamman (2023). Both studies showed that trained teachers were more competent

In test administration than the untrained teachers. It is surprising that this study and that of Muhammad (2017) found out that training does not influence test administration competence. This situation might be attributed to the teachers inability to remember or use the initial knowledge and skills (in test administration) they acquired during their teacher training. In addition, there could be other factors (e.g. attitude and efficacy) that explain the test administration competence.

Conclusion

From the findings, it was concluded that majority of the senior secondary school teachers i.e. 77% have less competent in test administration in Kano Municipal Educational Directorate Kano state. Therefore, the identified problem (lapses in test administration) was because, majority of the teachers were less competent in test administration. Furthermore, competence in test administration was not a function of training,

Recommendations

This study recommended that since majority of the senior secondary school teachers were not competent in test administration, state Ministry of Education should embark on staff development through organizing workshop, seminar and conferences so that teachers would acquire the pre- requisite knowledge and skills for test administration. In addition, it ensures strict compliance to the existing laid down rules and regulations on test administration.

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Assessment of Community Care Practices for the Elderly Persons in Kano Municipal Local Government Area, Kano State, Nigeria

By

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Abstract

This study assessed community care practices for the elderly in Kano Municipal Local Government Area, Kano State, Nigeria. The study explored three objectives. Survey research design was adopted with a population of 28,962 and sample size of 378 was randomly selected based on the guidelines of Research advisor (2006) through simple random and purposive sampling techniques. Researcher-made questionnaire titled Assessment Questionnaire on Community Elderly Care (AQCEC) was used and validated by three experts. A reliability index of 0.78 was obtained using test re-test method. The data collected were analyzed using descriptive statistics, in terms of frequency counts, simple percentages and mean. The findings revealed that, the elderly are generally not satisfied with their health conditions, the types of family level care practices for the elderly are personal care services, provision of supportive living environments and technological support services and the factors giving rise to the need for community care for the elderly are age factor, health status, changes to income and loosing children. The paper recommends among others that, the Kano State Government through Ministry for Rural and Community Development as well as Women Affairs and Social Development should introduce specific welfare programmes for the elderly to address lack of hygienic environment, being helpless among others aimed at promoting the wellbeing of the elderly

Keywords: *Community Care*, Elderly Person and Practice

Introduction

Globally, longer life expectancy has increased the elderly population, raising the need for community care. This trend also brings a higher burden of disease. In Africa, particularly Nigeria, care for the elderly was defined as those aged 65 and above receives little public attention, despite their growing numbers, which stood at 2.98% in 2022 (World Bank, 2017).Traditionally, extended family care for the elderly is declining due to modernization and globalization, weakening intergenerational support (Egwu, (2013) and Xu & Chow, 2011). Despite this, community care remains crucial for aging well, as the elderly contribute to society as cultural custodians and peacekeepers (UNFPA & Help Age, 2012; Asiyanbola, 2008). However, many face poverty, poor nutrition, and lack proper care after retirement, highlighting the urgent need to strengthen community-based elderly care systems.

Studies have shown that community care practices greatly enhance the quality of life for the elderly (Kemper, Applebaum & Harrigan (2007); Newman & Envall (2005) & (Doty, 2000). These practices help older adults live safely in their homes and avoid early institutionalization by offering services such as wellness programs, nutritional support, health education, caregiver counseling, assistance with housing, finances and home safety. They also empower individuals to gain greater control over their local communities (Chaudhary, Vyas & Parrish, 2010). Personal observation in the study area reveals that most elderly individuals in the study area (aged 60 and above) are disengaged from socioeconomic and civic activities, with many experiencing chronic health issues. However, some do not report symptoms, believing them to be normal signs of

aging. The study was driven by inadequate elderly care and weak national policy in Nigeria, prompting an evaluation of community-based elderly care in Kano Municipal, Kano State.

Statement of the Problem

Care for the elderly in Africa is known to be family-based. There are very few institutional arrangements for elderly care. Majority of older adults face various challenges in daily life and often require community care. However, of all age groups, the group over age 85; i.e. the oldest old is increasing. This demographic reality and the challenges it would unleash in future, Nigeria will be hard-pressed to meet the economic, health, psychological and material well-being of the elderly, especially as traditional family support systems for the elderly are breaking down and disappearing in the country. In view of the numerous community-based interventions in different areas of community life (youth, women, etc), it is important to examine the situation of community care practices for the elderly. Added to this, the situational analysis, particularly for the elderly care in Kano Municipal have not been researched, the paper therefore, seeks to fill the existing gap in the previous studies thereby assessing community care practices for the elderly persons in Kano Municipal Local Government, Kano State, Nigeria.

Research Questions

Based on the objectives above, the following research questions guided the study:

1) What are the health conditions of the elderly persons in Kano Municipal, Kano State?
2) What are the factors giving rise to the need for community care practices for the elderly persons in Kano Municipal, Kano State?
3) What are the types of community care practices for elderly persons in Kano Municipal?

Methodology

The study adopted survey research design. This was considered appropriate as no variable were manipulated. The population of the study comprised of all the elderly persons living in Kano Municipal. Based on the data obtained from the NPC, Kano State Office (2024), the projected number of elderly people whose age ranged from 60 years and above are 28,962 persons consisting of 16,006 males and 12,956 females. These were presented in table 1:

Table 1: ***Population Distribution of Elderly Persons in Kano Municipal Local Government Area***

Age Group	Male	Female	Total
60-64	4,473	3,580	8,053
65-69	4,045	2,545	6,590
70-74	2,812	2,385	5,197
75-79	1,403	876	2,279
80-84	1,547	1,825	3,372
85 and above	1,726	1,745	3,471
Grand Total	**16,006**	**12,956**	**28,962**

Source: National Population Commission, Kano State Office (2024).

Out of 28,962 subjects, representing the entire elderly persons residing in the study area, a sample size of 378 respondents aged 60 years and above was drawn from the sampled 5 wards, namely; Gandun-Albasa, Yakasai, She-She, Sharada and Shahuci in Kano Municipal. The justification behind the selection of 378 was based on the specified recommendation by Research Advisor (2006) which says that for a population of 28,962, a

sample of 378 are to be selected. Simple random sampling and purposive sampling techniques were employed in selecting the sample size of the study. However, researcher-made questionnaire titled "Assessment Questionnaire on Community Elderly Care (AQCEC)" was used and validated by the experts in Adult Education and Community Services, and Education Departments of Bayero University, Kano. A reliability index of 0.78 was obtained using test re-test method. Furthermore, the researchers administered a total number of 378 questionnaires to the sampled elderly persons in the study area in which a total number of 341 questionnaires were successfully filled and returned representing 90.2% of the total number of questionnaires randomly administered. The remaining 37 questionnaires were not returned with 9.8%. These had happened due to unwillingness of many respondents to devote their time to provide the needful information. Few respondents collected the instruments but failed to fill and return it back and some of them refused to disclose the information thinking that it would threaten their ageing condition. The data collected were analyzed using descriptive statistics, in terms of frequency counts, simple percentages and mean.

Result Presentation and Analysis Research Question One: What are the health conditions of the elderly persons in Kano Municipal Local Government Area, Kano State?

Table 2: ***Health Conditions of the Elderly Persons in Kano Municipal Local Government Area***

Items	Responses								Mean	Decision
	SA		A		D		SD			
	F	%	F	%	F	%	F	%		
I feel generally comfortable living in this community.	38	11.1	55	16.1	143	42.0	105	30.8	2.07	Disagreed
I fell sick in most of the time and having no one who could help me with medication in this community.	15	4.3	19	5.6	135	39.6	172	50.5	1.72	Disagreed
I often feel I'm burden to my family.	131	38.4	167	49.0	23	6.8	20	5.8	3.12	Agreed
I receive medical care from children and family members.	89	26.0	139	40.8	43	12.7	70	20.6	2.52	Agreed
I often find it easy to access medical facility in this community.	80	23.4	141	41.3	70	20.6	50	14.7	2.82	Agreed

The result in Table 2 shows the respondents' view on health conditions of the elderly persons in Kano Municipal. There are total 5 items which the respondents responded to and the mean scores of the three statements are 3.12, 2.54 and 2.82 which are above the decision rule of (2.5) and these implies that the respondents agreed that they often feels burden to their families, they receives medical care from children and family members and they often find it easy to access medical facility in their communities.

The foregoing analysis showed that from the entire responses, it is clear that the health conditions of the elderly persons are adversely affected due to uncomfortable living arrangement, limited access to medical care and feeling burden to their family members.

Research Question Two: What are the factors giving rise to the need for community care practices for the elderly persons in Kano Municipal Local Government Area, Kano State?

Table 4: ***Factors Giving Rise to the Need for Community Care Practices for the Elderly Persons in Kano Municipal Local Government Area***

Items	Responses								Mean	Decision
	SA		A		D		SD			
	F	%	F	%	F	%	F	%		
My age makes me feel isolated and therefore need community care.	133	39.0	163	47.9	30	8.8	15	4.3	3.23	Agreed
Change to my living arrangement due to health status is a factor for community elderly care.	120	35.1	136	40.0	46	13.4	39	11.4	3.02	Agreed
Changes to my income gain gives rise to the need for community care.	113	33.1	161	47.2	40	11.8	27	7.9	3.04	Agreed
Losing my children makes me suffer and therefore need community care.	135	39.6	137	40.2	52	15.2	17	5.0	3.14	Agreed
Lack of close intergenerational relationships gives rise to the need for community care.	120	35.1	46	13.4	136	40.0	39	11.4	2.82	Agreed

Table 4 shows the factors giving rise to the need for community care practices for the elderly persons in Kano Municipal. There are total five (5) items which the respondents responded to and the data clearly indicates the mean scores of the whole statements are 3.23, 3.02, 3.04, 3.14 and 2.82 which implies that the respondents agreed that age makes them feels isolated and therefore need community care, change to their living arrangement due to health status is a factor for community elderly care practices in the study area and changes to their income gaining. Other factors giving rise to the need for community care practices for the elderly persons includes; loose of children and lack of close the need for community care. The result generally revealed that there are factors giving rise to the need for community care practices for the elderly persons in the study area.

The foregoing analysis showed that; age factor, health status of the elderly, changes to income gaining activities, loosing children and lack of close intergenerational relationships were the major factors giving rise to the need for community care practices for the elderly persons in Kano Municipal Local Government Area of Kano State.

Research Question Three: What are the types of community care for the elderly persons in Kano Municipal Local Government Area, Kano State?

Table 3: ***Types of Community Care for the Elderly Persons in Kano Municipal Local Government Area***

Items	Responses								Mean	Decision
	SA		A		D		SD			
	F	%	F	%	F	%	F	%		
Personal care services like getting out of bed, bathing, toileting, dressing, feeding, etc is provided to me by family members.	135	39.5	179	52.4	27	7.9	0	0.0	3.32	Agreed
I enjoy medical care services provided by my family.	120	35.1	136	40.0	46	13.4	39	11.4	3.03	Agreed
I receive financial assistance by friends and families.	57	16.8	62	18.1	147	43.1	75	22.0	2.22	Disagreed
I enjoy supportive living environments by family members.	135	39.6	167	49.0	25	7.3	14	4.1	3.22	Agreed
I receive some technological support services (handset, television, etc) by family members.	100	29.3	170	49.9	45	13.1	26	7.7	3.15	Agreed

Table 3 shows the types of community care for the elderly persons in Kano Municipal. There are total of five (5) items which the respondents responded, the mean scores of the four statements are 3.32, 3.03, 3.22 andm3.15 which are above the decision rule of (2.5) and these implies that the respondents agreed that different types of care were provided for the elderly persons at family level and these include personal care services like getting out of bed, bathing, toileting, dressing, feeding, etc, medical care services, provision of supportive living environments and technological support services. This is because of the fact that their respective mean scores are above or around the grand mean of 3.03. The respondents seem to disagreed with mean scores of (2.22) totally with the fact that they were receive financial assistance by friends and families members in Kano Municipal, because the mean scores for these statements are below the average mean score of 3.0.

The foregoing analysis showed that; personal care services like getting out of bed, bathing, toileting, dressing, feeding, etc, medical care services, provision of supportive living environments and technological support services (handset, television, etc) are the major types of community care for the elderly persons being provided at family level in Kano Municipal.

Summary of Findings

The analysis of data revealed the following findings:

1) The health conditions of the elderly persons are adversely affected due to uncomfortable living arrangement, limited access to medical care and feeling burden to their family members in Kano Municipal Local Government Area.
2) The factors giving rise to the need for community care practices for the elderly persons includes; age factor, health status of the elderly, changes to income gaining activities, loosing children and lack of close intergenerational relationships in Kano Municipal.
3) The types of community care for the elderly persons being provided are personal care services, medical care services, provision of supportive living environments and technological support services in Kano Municipal Local Government Area.

Discussion of Findings

The findings of the study are discussed under the paragraph below:

Data obtained from research question one sought to determine the health conditions of the elderly persons in Kano Municipal Local Government Area, Kano State. The result shows that the health conditions of the elderly persons are adversely affected due to uncomfortable living arrangement, limited access to medical care and feeling burden to their family members. This finding is consistent with the works of Asiyanbola (2009) & Oladeji (2011) who found out that being feeling uncomfortable in the community due to poverty and poor infrastructural development have adverse effect on the health conditions of the elderly which transform to their well-being status. They further revealed that, elderly people living in Nigeria not only face lower life expectancies but also live a higher proportion of their lives in poor health. Governments have lackadaisical stance to the health of the elderly and family structure which have been known to give care to elderly are on the verge of collapse. Furthermore, Vijayanchali & Arumuga (2012) studied socioeconomic and health status of elderly in Dindigul, India. Their studies indicated that, with increasing age, the health problems increase and the economic resources of the elderly usually show a decline. Almost 50% of the elderly in tribals reported that the doctors were not present in the Primary Health Care (nearest 20 kms away) most of the time. As the case of health conditions of the elderly persons in the Kano Municipal, little medical care attention from children and family members also affects their health conditions, because during the field surveyed, it was observed that majority of the elderly persons often use home remedy or indigenous medicines for their ailments as the first preference. For them, seeking medical services is expensive unless it is from a public hospital. The elderly persons generally found to be the last person in a household to seek or to demand the medical care assistant, they prepare to remain silent than requesting from medical intervention and these make them feels as if they're burden to their families.

Data obtained from research question two also looked at the factors giving rise to the need for community care for the elderly persons in Kano Municipal. The analysis showed that, the factors giving rise to the need for community care for the elderly persons in the study area include; age factor, health status of the elderly, changes to income gaining activities, loosing children and lack of close intergenerational relationships. With regards to age as a factor giving rise to the need for community elderly care; According to United Nations Department of Economics and New York Special Affairs Populations Division (2005) publications, it was evident that the population of Nigerians aged 60 years and above is already increasing. Before now, there was little chance that a man and his wife would survive to see all their grandchildren, but today a lot of them do.

This demographic situation, unique to our time, has profound significance for the planning and delivery of community care for the elderly. This is because the process of aging is often confounded with other associated factors such as; deteriorating physical health, poor nutrition, bereavement, social isolation, and so on. The results also found out that, changes to income gaining activities, health status of the elderly, lack of special facilities in the hospital for geriatric care, loosing children and need to participate in leisure activities gave rise to the needs for community care for the elderly persons in Kano Municipal.

The findings are in consistent with works of Liu, Hao, & Zhang (2016) in their study on identifying community healthcare supports for the elderly and the factors affecting their aging care model preference: evidence from three districts of Beijing

They observed factors such as age, gender, needs factors; like socioeconomic inequalities in health, health status or the likelihood of being in poor health and therefore in need of help, and; enabling factors; the availability of social and material resources, such as income, personal, family and community resources.

The results under research question three which sought to examine the types of community care for the elderly persons in Kano Municipal. It clearly indicated that the types of family level care for the elderly persons in the study area are personal care services, medical care services, provision of supportive living environments and technological support services. These findings are agreed with the findings of Cruz, Nagib, Pereira, Oliveira, Vilela, Ferraz dos, & Narriman, (2016) who found that family care was significantly related to psychosocial well-being of elder in that families and have been the major resource, and there are always contact relationships between older people and their families. They also found that, at family level care; a wide array of social, health, and related support services were extended to the elderly from their families. The finding of this study was also consistent with the findings of Liu, Hao, & Zhang (2016) in identifying community healthcare supports for the elderly and the factors affecting their aging care model preference: evidence from three districts of Beijing. Their findings showed that, elderly persons received personal support services from children, family members and friends. It was also found out that, elderly persons received support from spouse, children and friends.

Conclusions

From the study findings and results obtained it is proved that the health conditions of the elderly persons are adversely affected due to feeling burden to their families, little medical care attention from children and family members. They also experienced difficulty in accessing medical facility and are generally not satisfied with their health conditions in Kano Municipal. The study also concluded that, the types of family level care for the elderly persons includes personal care services, medical care, provision of supportive living environments and technological support services. In addition to these, the study concluded that, the factors giving rise to the need for community care for the elderly persons are age factor, health status, changes to income, loosing children and lack of close intergenerational relationships in Kano Municipal.

Recommendations

1) The Kano State Government through the Ministry for Rural and Community Development as well as Women Affairs and Social Development should introduce specific welfare programmes for the elderly to address the problems of feeling burden among others aimed at promoting the health conditions of the elderly persons in Kano Municipal.

2) The Kano State Government through the Ministry of Health and Primary Healthcare Management Board should enrich community capacities to ensure integrated services to the elderly through provision of adequate special health facilities for geriatric care that would support the elderly and encouraging them to utilize community services in order to reduce the pressure on families in Kano Municipal, Kano State.

3) The NGOs such as Elderly Support Initiative of Nigeria (ESIN) Kano State chapter, All Care Charitable Foundation and Society for Family Health should carryout advocacy campaign through media to raise awareness on those elderly who need considerable long- term medical care. This is to enable the families and members of the community to be aware of the care requirements needed by the elderly and be given adequate attention.

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