



# **SUSTAINABLE EDUCATION IN AFRICA**

Peer Reviewed Book Chapter



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# TABLE OF CONTENTS

<b>Cover Title</b>	
Editorial Board Members	iii
Acknowledgement	iv
Contributing Authors	v
Table of Contents	vi
<i>Concluding Synthesis</i>	163
<i>Implications for Practice</i>	164
<i>Editors' Note</i>	165

<b>1</b>	<b>ARTIFICIAL INTELLIGENCE AND EDUCATIONAL PLANNING IN NIGERIA: PROSPECTS, CHALLENGES, AND POLICY IMPLICATIONS FOR SUSTAINABLE EDUCATIONAL DEVELOPMENT</b>	<b>1</b>
	<i>UDEGBE Chigozie Charles</i>	
<b>2</b>	<b>DIGITALIZATION AND EDUCATIONAL MANAGEMENT IN NIGERIA: IMPLICATIONS FOR ADMINISTRATIVE EFFICIENCY, ACCOUNTABILITY, AND SUSTAINABLE EDUCATIONAL DEVELOPMENT</b>	<b>16</b>
	<i>OLOFINKUA Vincent Kayode, (Ph.D)</i> <i>ONAFOWOPE Mary Adesola, (Ph.D)</i> <i>OWEIKPODOR Vera Gbaeprekumo (Ph.D)</i>	
<b>3</b>	<b>PAPERLESS EDUCATIONAL SYSTEM IN NIGERIA: PROBLEMS AND SOLUTIONS</b>	<b>29</b>
	<i>AWADIEGWU Amaka Emmanuela</i>	
<b>4</b>	<b>CIRCULAR ECONOMY AND THE NIGERIAN EDUCATION SYSTEM: OPPORTUNITIES, CHALLENGES, AND PATHWAYS FOR SUSTAINABLE EDUCATIONAL DEVELOPMENT</b>	<b>40</b>
	<i>NWANKWO Nkechi Chinelo (Ph.D)</i>	
<b>5</b>	<b>STRATEGIES TO PROMOTE GENDER EQUALITY IN NIGERIAN SCHOOLS</b>	<b>52</b>
	<i>EDOR Job John</i>	
<b>6</b>	<b>ECONOMIC HARDSHIPS AND THEIR IMPLICATIONS FOR ACCESS, QUALITY, AND EQUITY IN THE NIGERIAN EDUCATION SYSTEM</b>	<b>63</b>
	<i>UGWUNNAMCHI Uchenna Jacinta Ph.D</i>	

<b>7</b>	<b>BANDITRY AND ITS IMPLICATIONS FOR ACCESS, SAFETY, AND EDUCATIONAL DEVELOPMENT IN NIGERIA</b>  <i>UNACHUKWU Ijeoma Blessing (Ph.D)</i>	<b>74</b>
<b>8</b>	<b>INNOVATION, EDUCATION AND NATIONAL DEVELOPMENT</b>  <i>ONAFOWOPE Mary Adesola, (Ph. D)</i> <i>OLOFINKUA Vincent Kayode, Ph.d</i> <i>OWEIKPODOR Vera Gbaeprekumo (Ph.D)</i>	<b>83</b>
<b>9</b>	<b>CHALLENGES FACING INNOVATION EDUCATION IN NIGERIA</b>  <i>UGHENU, Nwamaka Perpetua</i>	<b>94</b>
<b>10</b>	<b>THE ROLE OF EDUCATIONAL PSYCHOLOGY IN ENHANCING LEARNING AND ACADEMIC ACHIEVEMENT</b>  <i>EKE, Ben Ethel, (Ph.D).</i>	<b>107</b>
<b>11</b>	<b>EMOTIONAL INTELLIGENCE AND TEACHERS' JOB PERFORMANCE IN NIGERIAN SCHOOLS: STRATEGIES FOR EFFECTIVE EMOTIONAL MANAGEMENT</b>  <i>ORANUSI Ndidia Stella.</i>	<b>115</b>
<b>12</b>	<b>EVALUATING THE BENEFITS OF THE FG ASUU AGREEMENT PACT 2026 IN THE DEVELOPMENT OF UNIVERSITIES IN NIGERIA</b>  <i>Victor Olugbenga AYOKO</i>	<b>126</b>
<b>13</b>	<b>CURRICULUM IMPLEMENTATION IN NIGERIAN SCHOOLS: CHALLENGES AND SOLUTIONS</b>  <i>Salihu, Habibat Atti (Ph.D)</i> <i>Dr. Rauf Olaiya SARAFADEN</i>	<b>137</b>
<b>14</b>	<b>ARTIFICIAL INTELLIGENCE AS A TOOL FOR ENHANCING TRANSPARENCY AND MERITOCRACY IN THE SELECTION OF PRINCIPAL OFFICERS IN NIGERIAN UNIVERSITIES.</b>  <i>Niyi Jacob OGUNODE – (Ph.D)</i>	<b>151</b>



# 8

## INNOVATION, EDUCATION AND NATIONAL DEVELOPMENT

By

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### Abstract

Innovation and education are pivotal drivers of sustainable national development, particularly in developing countries such as Nigeria. This chapter examines the role of innovation-oriented education in promoting economic growth, social development, and environmental sustainability. It highlights how integrating creativity, critical thinking, problem-solving, research, and entrepreneurship into the educational system equips learners with the skills and competencies necessary to address national challenges. The chapter also explores the contribution of innovation education to human capital development, technological advancement, job creation, and the reduction of socio-economic inequalities. Furthermore, it identifies key challenges hindering the effective implementation of innovation-driven education in Nigeria, including inadequate funding, poor infrastructure, curriculum gaps, and limited teacher capacity. The study underscores the



urgency of strategic investments, policy reforms, and institutional support to ensure that education serves as a catalyst for sustainable national development in Nigeria.

**Keywords:** Innovation, education , pivotal, drivers, sustainable, national, development

## 1.0 Introduction

Innovation and education are widely recognized as key drivers of sustainable national development. In Nigeria, a country rich in human and natural resources but facing persistent economic, social, and environmental challenges, leveraging innovation through education has become essential for achieving sustainable growth. Education serves as the foundation for human capital development, while innovation equips individuals with the skills, creativity, and problem-solving abilities needed to generate practical solutions to societal challenges. Together, innovation and education form a powerful synergy that can transform the Nigerian economy, improve social well-being, and promote environmental sustainability.

Historically, Nigeria's education system has focused largely on theoretical knowledge, with limited emphasis on practical skills, critical thinking, and entrepreneurial development. This has contributed to the high rate of graduate unemployment, low productivity, and slow technological advancement. Innovation education, which integrates research, technology, entrepreneurship, and creative problem-solving into learning processes, addresses these gaps by preparing learners to adapt to rapidly changing socio-economic contexts. Students trained in innovation-driven environments are better positioned to generate new ideas, develop sustainable solutions, and contribute meaningfully to national development.

Sustainable national development requires a multidimensional approach that balances economic growth, social equity, and environmental protection. Innovation education supports this objective by fostering digital literacy, promoting green technologies, encouraging local entrepreneurship, and enhancing research and development. By equipping learners with the capacity to design solutions that respond to Nigeria's unique developmental challenges—such as poverty, energy shortages, climate change, and inadequate healthcare—innovation education becomes an essential instrument for national transformation.

This chapter examines the role of innovation and education as catalysts for sustainable national development in Nigeria. It explores the concept of innovation education, its integration into the educational system, its contribution to economic resilience, social inclusion, and environmental sustainability, and the challenges to its effective implementation. The chapter emphasizes that



positioning education as a hub for innovation is critical to building a knowledge-based economy and achieving long-term sustainable development in Nigeria.

## 2.0 Conceptual Terms

### 2.1 Concept of Innovation

Innovation is the systematic practice of developing and marketing breakthrough products and services for adoption by customers. Innovation is defined as the process of bringing about new ideas, methods, products, services, or solutions that have a significant positive impact and value. It involves transforming creative concepts into tangible outcomes that improve efficiency, and effectiveness, or address unmet needs (Jain, 2023). Innovations are not ends in themselves but means towards an end. From the forgoing, it can be said that innovation preset change, as innovation is synonymous with creative thinking and it is the result of this thinking that is being translated into change (Fadipe and Adepoju, 2008). It is imperative to state here that an innovation does not mean the thing with creativity, change, improvement, product, development and invention. Rather, each of these activities may lead to innovation (Danladi, 2019).

Innovation is not limited to technological advancements and encompasses novel approaches to problem-solving, processes, organizational practices, or business model innovation. At its core, innovation involves challenging the status quo, thinking outside the box, and taking calculated risks to drive progress and achieve breakthrough outcomes (Jain, 2023). Innovation to be the process of taking a creative idea and turning it into a useful product, service or method of operation. The authors further stress that, all innovations start as an idea, after which some of them reach the level of overt and tangible expression through the implementation process (Elsewhere, Robbin and Coulter 1998).

Innovation as introduction of new idea, method or invention. Innovation is purposeful, organized, risk-taking change introduced for the purpose of ensuring efficiency and increased productivity. It means not only adapting to new conditions but creating new conditions (Longman, (1995). Similarly, Innovation as any idea, practice or material artifact perceived to be new by the relevant unit of adoption (Bassegy, 2008). Innovation is driven by a combination of factors, including curiosity, creativity, and the desire for improvement. It requires a mindset that embraces change, welcomes ideation, and encourages experimentation. Innovation can occur in various contexts, such as business, science, technology, social sectors, or public services. It can lead to economic growth, social progress, improved quality of life, and sustainable development (Jain, 2023). Innovation refers to the process of generating, developing, and applying new ideas, methods, products, or processes that create value, improve efficiency, or solve problems. It goes beyond simple creativity by involving practical implementation and measurable impact on society, organizations, or the economy. Innovation can take several forms, including:



**Technological innovation** – Introduction of new technologies or improvement of existing ones to enhance productivity (e.g., digital tools, renewable energy systems).

**Process innovation** – Development of new or improved methods of doing tasks, managing resources, or delivering services.

**Product innovation** – Creation of new products or the improvement of existing ones to meet societal needs.

**Social innovation** – Novel solutions to social problems that enhance human well-being and promote equity.

In the context of national development, innovation is a critical driver of economic growth, competitiveness, and sustainable development. Countries that invest in innovation, research, and knowledge creation tend to achieve higher productivity, technological advancement, and improved quality of life for their citizens. In Nigeria, innovation is especially crucial for addressing developmental challenges such as unemployment, energy deficits, environmental degradation, and social inequality.

## 2.2 Concept of Education

Education is the systematic process of facilitating learning, acquiring knowledge, skills, values, and attitudes that enable individuals to develop their full potential and contribute meaningfully to society. It encompasses formal, informal, and non-formal systems and spans all levels—from early childhood education to tertiary institutions and lifelong learning. Education is a fundamental social process through which individuals acquire knowledge, skills, values, attitudes, and competencies necessary for personal development and effective participation in society. It is a lifelong process that begins at birth and continues throughout life, taking place in formal, non-formal, and informal settings. Education helps individuals understand themselves and the world around them while preparing them to contribute meaningfully to societal growth and development (Ogunode, 2025).

Education can be viewed as both a process and a product. As a process, it involves teaching, learning, training, and experience aimed at developing the mental, physical, moral, social, and emotional capacities of learners. As a product, it results in the acquisition of knowledge, skills, behaviors, and values that shape an individual's character and abilities. Through education, learners are empowered to think critically, solve problems, and make informed decisions (Peter, 2020).

From a formal perspective, education refers to structured learning that takes place in schools, colleges, and universities, following an organized curriculum and guided by trained teachers. This type of education leads to certification and qualifications. Non-formal education includes



organized learning activities outside the formal school system, such as vocational training, adult education, and skill acquisition programs. Informal education occurs through daily life experiences, family interactions, cultural practices, media, and social activities, often without a fixed structure. Education also serves as a key instrument for socialization, helping individuals learn societal norms, values, culture, and acceptable behaviors. It promotes moral development, discipline, tolerance, and respect for others, thereby fostering social cohesion and national unity. In addition, education plays a vital role in transmitting cultural heritage from one generation to another (NOUN, 2012; Musa, 2014)/.

### **3.0 Innovation and Education for National Development in Nigeria**

Innovation and education are central pillars of national development in Nigeria, particularly in an era characterized by globalization, technological advancement, and a knowledge-driven economy. By integrating innovation into the education system, Nigeria can strengthen human capital, promote entrepreneurship, enhance social development, and achieve sustainable development. Education that emphasizes innovation goes beyond the transmission of knowledge to focus on practical skills, creativity, and the ability to solve real-life problems that confront society.

#### **Human Capital Development through Innovation Education**

Education is a fundamental instrument for developing human capital, which consists of the knowledge, skills, competencies, values, and attitudes that enhance individual productivity and collective societal progress. Innovation education enriches traditional learning by prioritizing creativity, critical thinking, research, and the practical application of knowledge to real-world challenges.

#### **Skill acquisition:**

Innovation-driven curricula provide learners with relevant technical, vocational, and digital skills aligned with the needs of a modern economy. In Nigeria, this includes skills in engineering, information and communication technology (ICT), renewable energy, agriculture, healthcare technology, and manufacturing. Through practical training, laboratory work, internships, and project-based learning, students gain hands-on experience that improves their employability. Such skills reduce the mismatch between education and labor market demands, thereby helping to address graduate unemployment and underemployment.

#### **Critical thinking and problem-solving:**

Innovation education trains students to think analytically and creatively rather than relying solely on rote memorization. Learners are encouraged to identify problems, assess alternative solutions, and apply knowledge in innovative ways. This capacity is particularly important in Nigeria, where challenges such as infrastructural deficits, food insecurity, health crises, and environmental



degradation require locally generated solutions. Graduates equipped with problem-solving skills are better positioned to contribute meaningfully to national development.

### **Research and development (R&D):**

Educational institutions play a vital role as centers of research, innovation, and knowledge creation. Through innovation-oriented education, universities and research institutions can develop new technologies, products, and processes relevant to national needs. Effective R&D promotes collaboration between academia, industry, and government, leading to the commercialization of research outputs. In Nigeria, strengthened R&D capacity can support advancements in agriculture, medicine, energy, and technology, thereby stimulating industrial growth and economic competitiveness. Investment in innovation education enhances Nigeria's human capital base and ensures that graduates are capable of contributing effectively to key sectors critical for economic diversification and national development.

### **Promoting Entrepreneurship and Economic Growth**

Innovation education plays a significant role in fostering entrepreneurship and stimulating economic growth. By nurturing an entrepreneurial mindset, education empowers individuals to create opportunities rather than rely solely on paid employment.

### **Startups and small businesses:**

Innovation-oriented education equips students with the skills and confidence to establish startups and small-scale enterprises. Through exposure to business planning, product development, and market analysis, learners can transform ideas into viable enterprises. These businesses contribute to job creation, income generation, and economic activity, particularly among youths, who constitute a large proportion of Nigeria's population.

### **Economic diversification:**

Nigeria's heavy dependence on oil revenue has exposed the economy to global market fluctuations. Innovation education encourages the development of alternative sectors such as agriculture, manufacturing, creative industries, and technology. By promoting locally adapted innovations and value-added production, education supports economic diversification and reduces vulnerability to external shocks.

### **Technology-driven growth:**

Digital literacy and technology-based education enable learners to harness modern tools such as ICT, artificial intelligence, data analytics, and automation. These technologies increase productivity, efficiency, and competitiveness across various sectors. In Nigeria, technology-driven innovation supports the growth of the digital economy, e-commerce, fintech, and software



development, positioning the country favorably in the global knowledge economy. Through entrepreneurship and technological innovation, education becomes a strategic driver of economic transformation and long-term national development.

### **Enhancing Social Development and Inclusion**

Beyond economic growth, innovation in education contributes significantly to social development by promoting inclusion, equity, and social responsibility.

#### **Inclusive education:**

Innovative teaching methods such as e-learning platforms, blended learning, and assistive technologies expand access to education for marginalized populations. In Nigeria, these approaches can improve educational opportunities for girls, rural learners, internally displaced persons, and learners with disabilities. Inclusive innovation education reduces educational inequality and ensures that all segments of society can contribute to national development.

#### **Community development:**

Innovation-driven projects within schools and universities often address community-based challenges. Students and researchers can develop solutions related to clean water supply, renewable energy, waste management, healthcare delivery, and food security. Such initiatives strengthen the link between education and society, ensuring that academic knowledge translates into tangible community benefits

#### **Social empowerment:**

Innovation education cultivates socially conscious and responsible citizens. Learners develop leadership skills, teamwork, and civic awareness, enabling them to initiate programs that promote social cohesion, poverty reduction, and improved quality of life. This social empowerment reinforces national unity and stability, which are essential for sustainable development.

Through these contributions, innovation in education supports social progress and national development beyond purely economic indicators.

### **Promoting Sustainable Development**

Sustainable national development requires a balanced approach that integrates economic growth, environmental protection, and social equity. Innovation education equips learners with the capacity to design and implement sustainable solutions that address present needs without compromising future generations.



### **Environmental sustainability**

Innovation education promotes awareness and practical solutions related to environmental challenges. Students can innovate in renewable energy, sustainable agriculture, climate-smart technologies, and environmental conservation. These innovations are crucial for Nigeria, which faces issues such as climate change, deforestation, pollution, and land degradation.

### **Policy and governance**

Education that emphasizes innovation develops critical thinkers capable of contributing to effective governance and policymaking. Graduates with analytical and research skills can support evidence-based decision-making, transparency, and accountability in public institutions. This strengthens democratic governance and institutional effectiveness.

### **Technological sustainability**

Innovation education fosters long-term technological adoption and adaptation. By developing local technological capacity, Nigeria can reduce dependence on foreign technologies and build resilient systems that support sustained economic and social development.

## **B- Challenges to Innovation Education in Nigeria**

Despite the recognized importance of innovation education in driving economic growth, technological advancement, and national development, Nigeria faces numerous challenges in effectively integrating innovation into its educational system. These challenges cut across funding, infrastructure, curriculum design, human capacity, and socio-economic conditions.

### **Inadequate funding:**

One of the most critical obstacles to innovation education in Nigeria is insufficient funding of the education sector. Government budgetary allocations to education have consistently fallen below international recommendations, limiting the ability of schools and higher institutions to invest in innovation-driven initiatives. Research and development (R&D) activities are underfunded, and innovation hubs, laboratories, and incubation centers are either poorly equipped or completely absent in many institutions. As a result, students and researchers lack access to grants, modern tools, and resources needed to explore creative ideas, develop prototypes, and translate innovations into practical solutions. Poor funding also discourages partnerships between educational institutions and industries that could otherwise support innovation.

### **Poor infrastructure:**

Innovation education thrives in environments with functional infrastructure such as well-equipped laboratories, workshops, reliable electricity, internet connectivity, and modern classrooms. In



Nigeria, many schools—particularly public and rural institutions—operate with dilapidated buildings, obsolete equipment, and inadequate ICT facilities. Frequent power outages and limited broadband access further hinder the use of digital technologies, online learning platforms, and virtual laboratories. Without adequate infrastructure, practical learning, experimentation, and technology-driven instruction become difficult, thereby weakening students' exposure to real-world innovation processes.

### **Curriculum gaps:**

Another major challenge is the nature of the existing curriculum at various levels of education. Many Nigerian curricula remain largely theoretical and examination-oriented, emphasizing memorization and rote learning rather than creativity, critical thinking, problem-solving, and entrepreneurship. Innovation-related subjects such as design thinking, coding, robotics, research methods, and entrepreneurial studies are either insufficiently covered or treated as optional. This curriculum gap limits students' ability to develop innovative mindsets and practical skills needed to address societal and economic challenges. The slow pace of curriculum review and implementation also makes it difficult for the education system to keep up with global technological and innovation trends.

### **Low teacher capacity**

Teachers play a central role in fostering innovation, yet many educators in Nigeria lack adequate training in innovation pedagogy, digital literacy, and modern teaching methods. Limited access to continuous professional development, workshops, and retraining programs reduces teachers' ability to integrate technology, project-based learning, and research activities into classroom instruction. In some cases, teachers themselves are unfamiliar with emerging technologies and innovative practices, making it challenging for them to guide students effectively. Poor motivation, heavy workloads, and inadequate incentives further affect teachers' willingness and ability to adopt innovative approaches to teaching and learning.

### **Socio-economic constraints:**

Socio-economic factors such as poverty, unemployment, and inequality significantly affect access to innovation education in Nigeria. Many students from low-income households cannot afford digital devices, internet subscriptions, or learning materials required for technology-based and innovation-oriented education. Regional disparities between urban and rural areas also mean that students in rural communities are often excluded from innovation opportunities available in cities, such as tech hubs, science parks, and well-equipped schools. Gender disparities and cultural barriers in some regions further limit participation in science, technology, engineering, and innovation-related fields. These socio-economic constraints contribute to unequal access and outcomes in innovation education across the country.



### **Policy and implementation challenges:**

In addition to the above, weak policy implementation and lack of coordination among stakeholders hinder the growth of innovation education. Although policies may recognize innovation and STEM education, poor execution, inconsistency, and limited monitoring reduce their effectiveness. Weak collaboration between government, educational institutions, the private sector, and research organizations also limits the development of a robust innovation ecosystem.

### **4.0 Conclusion**

Innovation education is a critical instrument for achieving sustainable national development in Nigeria. By equipping learners with practical skills, technological knowledge, and entrepreneurial abilities, it promotes human capital development, economic diversification, and social empowerment. Innovation-oriented education fosters creativity, critical thinking, and problem-solving, enabling individuals to generate solutions to societal and environmental challenges. Despite its transformative potential, the effective implementation of innovation education in Nigeria is constrained by inadequate funding, poor infrastructure, curriculum deficiencies, and limited teacher capacity. Addressing these challenges requires coordinated government policies, increased investment in educational infrastructure and research, curriculum reforms, and professional development for educators. Ultimately, prioritizing innovation in education will enhance national productivity, promote social inclusion, and ensure that Nigeria attains long-term sustainable development in a competitive global environment.

### **References**

- Biasi, Barbara; Deming, David J.; Moser, Petra. (2021). Education and Innovation. NBER Working Paper, 28544 (National Bureau of Economic Research). Economic analysis of the link between education systems and innovation outcomes.
- Bassey, S.U (2008). Change management in education. In J.B. babalola & A.O. Ayeni (Eds). *Educational theories: Theories and tasks*. Ibadan: Macmillan Nigeria Publishers.
- Bello, R. T. (2020) Innovation and Educational technologies in Nigeria. Kebbi, Nigeria.
- Barrichello, Alcides, Morano, Rogerio Scabim, Feldmann, Paulo Roberto & Jacomossi, Rafael Ricardo. (2020).The importance of education in the context of innovation and competitiveness of nations.\* International Journal of Education Economics and Development, Vol. 11(2). Empirical study linking education, innovation, and national competitiveness.



- Danladi, D. (2019). Innovation and education development in Nigeria. Kano. Nigeria.
- Ellsworth, J.B. (2000). *Surviving change: A survey of educational change models*. NY: ERIC Clearinghouse on Information and Technology.
- Fadipe, J.O., & Adepoju, T.L. (2008). Change and innovation processes in formal organizations. In J.B. babalola & A.O. Ayeni (Eds). *Educational theories: Theories and tasks*. Ibadan: Macmillan Nigeria Publishers.
- George, Owhoekwe Nwameze & Chukwuka, Godspower Kingsley. (2023). Designing Smart and Innovative Learning Education System in Nigerian Tertiary Institutions. *Innovation* 4(2):14–24.
- Jain, N (2023). What is Innovation? Definition, Types, Examples and Process <https://ideascale.com/blog/what-is-innovation/>
- Mashwama, Nokulunga Xolile & Madubela, Bubele. (2025). Innovations in pedagogy and technology for engineering education: A systematic review. *Interdisciplinary Journal of Education Research*, 7(s1). Explores educational innovation and technology for improved outcomes.
- OECD (2016). *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills\** (OECD/CERI Report). A comprehensive policy review on how education innovation supports national education goals.
- Onimisi, Timothy. (2025). Improved Security and Education: Pathways to National Development.\* *International Journal of Contemporary Security Studies*, 1(1):15–?
- Okolo, C. V. (2023). Does tertiary education promote technological innovation? \* *Cogent Economics & Finance*(Taylor & Francis).
- Tambuwal, Hamza Muhammad et al. (2025). Innovations Required in Business Education Curriculum in Colleges of Education in Nigeria: A Strategic Approach for Sustainable Development. *AAU Journal of Business Educators*.
- Udekwe, Emmanuel; Obadire, Olusegun Samson; Iwu, Chux Gervase. (2025) Exploring Innovation of Internationalisation Effectiveness in the Higher Education Sector: A Systematic Review. *Encyclopedia*, 5(2):80.
- Ugbogbo, Helen E., Akwemoh, Magdalene O., & Omoregie, Charles B. (2013). The Role and Challenges of Education in National Development (The Nigeria Experience). *Journal of Educational and Social Research*, 3(10):25

### Concluding Synthesis

This edited volume, *Sustainable Education in Africa*, presents a robust and multidimensional exploration of the evolving dynamics shaping educational systems across Nigeria and the broader African context. The contributions collectively interrogate critical issues such as digital transformation, artificial intelligence in educational planning, gender inclusivity, economic constraints, institutional effectiveness, and the intersection of education with national development priorities.

A synthesis of the chapters reveals that sustainable education in Africa is inherently complex and requires an integrated, systems-oriented approach. While technological advancements offer transformative potential for improving educational access, quality, and administration, their successful implementation is dependent on enabling environments characterized by adequate infrastructure, policy coherence, and human capacity development.

Furthermore, the persistence of structural barriers—including underfunding, inequality, insecurity, and governance challenges—continues to impede progress. The contributors consistently emphasize that achieving sustainability in education necessitates deliberate, inclusive, and context-sensitive policy interventions that address both systemic inefficiencies and emerging global trends.

Importantly, this volume reinforces the position of education as a strategic instrument for sustainable development, aligning with global development priorities while responding to local realities. The insights generated herein contribute meaningfully to scholarly discourse and provide actionable knowledge for stakeholders across the education sector.

### Implications for Practice

Drawing from the collective contributions of this volume, several practical implications emerge for policymakers, educational leaders, and practitioners:

- **Policy and Governance:** Governments should prioritize coherent and forward-looking educational policies that integrate technology, inclusivity, and sustainability into national development agendas.
- **Investment in Infrastructure:** There is a critical need for sustained investment in digital infrastructure, learning facilities, and instructional resources to support modern educational delivery systems.
- **Capacity Building:** Continuous professional development for educators and administrators is essential, particularly in the areas of digital literacy, data-driven decision-making, and innovative pedagogy.
- **Equity and Inclusion:** Educational interventions must intentionally address gender disparities, socio-economic inequalities, and access challenges affecting marginalized populations.
- **Research and Innovation:** Institutions should foster a culture of research and innovation to generate context-relevant solutions and inform evidence-based practices.
- **Collaboration:** Stronger partnerships among governments, private sector actors, development agencies, and academic institutions are necessary to drive sustainable educational transformation.

### **Editors' Note**

The editors of this volume express profound appreciation to all contributing authors for their scholarly rigor, intellectual depth, and commitment to advancing knowledge in the field of education. The diversity of perspectives represented in this work reflects the complexity of educational challenges and opportunities within Africa.

We also acknowledge the invaluable contributions of peer reviewers, editorial board members, and institutional supporters whose efforts ensured the academic quality and integrity of this publication.

This volume is conceived not only as a scholarly resource but also as a catalyst for dialogue, policy reform, and practical innovation. It is our expectation that the ideas presented herein will inspire further research and contribute to the ongoing transformation of education systems across the continent.