# PERSPECTIVE
## ON EDUCATION
# IN NIGERIA

**VOLUME TWO**
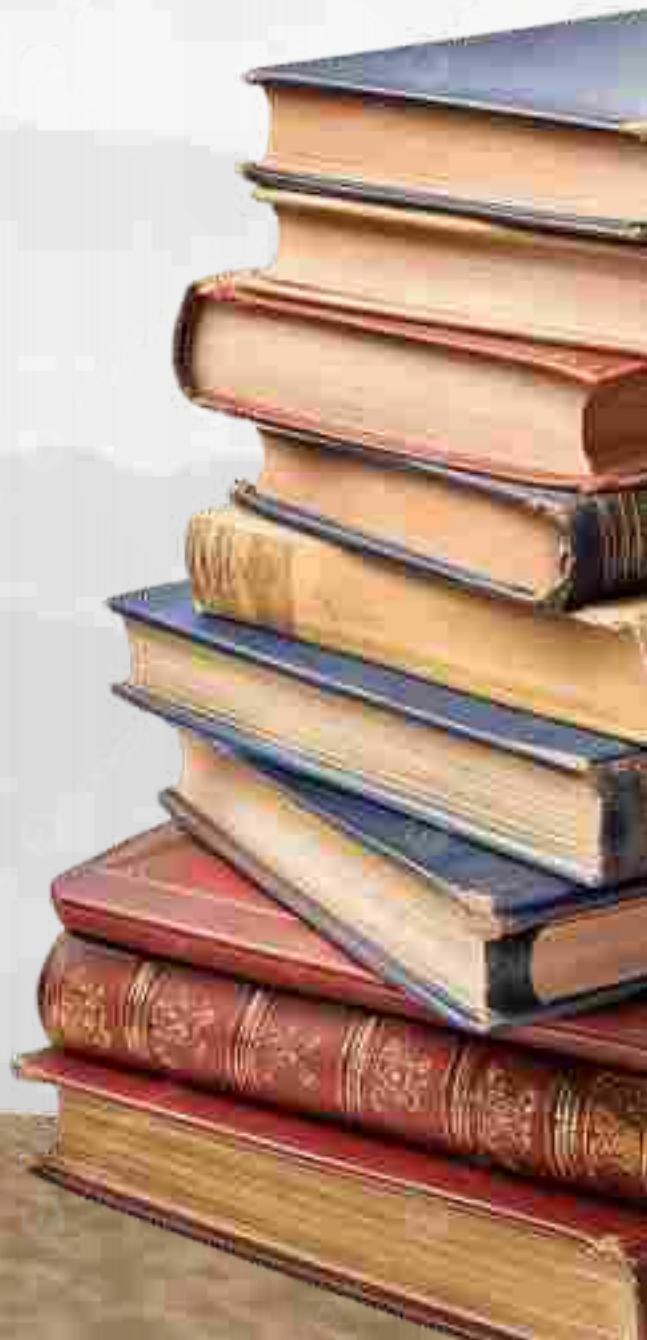
# PERSPECTIVE ON EDUCATION IN NIGERIA

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# EDITORIAL BOARD MEMBERS

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# Acknowledgments

# CONTRIBUTING AUTHORS

**Ogunode Niyi Jacob, PhD**

Department of Educational Management, Faculty of Education, Federal University Wukari, Taraba State, Nigeria

**Ayodele Ebunolu Nwisagbo, PhD**

Department of Educational Management, Faculty of Education, Rivers State University, Port Harcourt, Nigeria

**Usman Ibrahim, PhD**

Department of Sociology, Faculty of Social Sciences, Federal University of Lafia, Nasarawa State, Nigeria

**Oyekanmi, Funmilayo Bosede, PhD**

Department of Fisheries and Aquaculture, University of Ilesa, Osun State, Nigeria

**Mary Adanna Chinwuba, PhD**.

Executive Director, Chalcedony Schools; National Association of Proprietors of Private Schools (NAPPS), Abuja

**Adamu Awwal Salman**

Kogi State College of Education, Ankpa, Nigeria

**Danyawo Musa Adamu, PhD**.

Department of Criminology and Security Studies, Faculty of Social Sciences, Federal University of Lafia, Nasarawa State, Nigeria

**Olamoyegun, Stephania Olabisi, PhD**.

Department of Science Education, University of Abuja, Nigeria

**Ola-Adeniji Elizabeth Bolarinwa**

Department of Science Education, University of Abuja, Nigeria

**Olapade Olubunmi Olayinka**.

Department of Human Resources and Administration, Nigeria Airspace Management Agency (NAMA), Nigeria

**Sani Kasimu, PhD**.

Department of Public Administration, Faculty of Management Sciences, Federal University Wukari, Nigeria

**Inemesit Nsikak Edet**.

Assistant Chief Education Officer, Federal Ministry of Education, Abuja, Nigeria

**Nwankwo Nkechi Chinelo, PhD**.

Department of Educational Management and Planning, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria

**Unachukwu Ijeoma Blessing, PhD**.

Department of Economics Education, Federal College of Education (Technical), Umunze, Nigeria

**Christopher Idowu Ojo**.

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Temitope Zulfah Mustapha**

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Emeana Geraldine Chinwe**

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Victor Olugbenga Ayoko**.

Department of Educational Foundations, Faculty of Education, National Open University of Nigeria

**Galadima, Farida Ibrahim**.

Department of Adult and Continuing Education, Federal University Wukari, Nigeria

**JAE, Talatu**

Department of Educational Foundation, Taraba State University, Jalngo

**Maryam Abdullahi, PhD**.

Department of Education, Nigerian Police Academy, Wudil, Kano, Nigeria

**Muhammad Danjuma Maiwada**

Department of Education, Nigerian Police Academy, Wudil, Kano, Nigeria

**Umoru Abdulrasheed Oseni**.

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Saleh Khalid Mahmud**.

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Ronald Winifred Abhulimen, PhD**.

Biological Sciences Department, Faculty of Pure and Applied Sciences, Federal University Wukari, Nigeria.

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**CHAPTER TWELVE**

# DIGITALIZATION OF TERTIARY EDUCATION IN NIGERIA: BENEFITS, PROBLEMS AND SOLUTION

**By**

**Christopher Idowu Ojo** – *Lead Author*
Department of Educational Management, Faculty of Education, University of Abuja, Nigeria
Phone: 08133154731
Email: christopherojo70@gmail.com

**Temitope Zulfah Mustapha**
Department of Educational Management, Faculty of Education, University of Abuja, Nigeria
Phone: 08039171701
Email: temitopemustapha29@gmail.com

**Emeana Geraldine Chinwe**
Department of Educational Management, Faculty of Education, University of Abuja, Nigeria
Phone: 08033752432
Email: jaygreg2003@gmail.com

**ABSTRACT**

The digitalization of tertiary education in Nigeria is transforming how teaching, learning, research, and administration are conducted across universities, polytechnics, and colleges of education. This chapter explores what digitalization entails—the integration of ICT tools into pedagogy, student support, assessment, and institutional management—and its benefits such as broadened access, flexible learning schedules, richer pedagogical innovation, improved administrative efficiency, and better research collaboration (Ajayi, 2021; NITDA, 2021). It also evaluates the challenges that hamper implementation: limited infrastructure (unstable power supply, poor internet connectivity), high costs of hardware and software, resistance to change from lecturers and administrators, lack of digital skills among faculty and students, and concerns with data security (Jegede & Abashi, 2019; Olatunde-Aiyedun, Eyiolorunse-Aiyedun & Ogunode, 2021). Drawing on Nigerian case studies and international examples, the chapter proposes sustainable strategies: invest in infrastructure development; provide continuous ICT training; adopt blended learning and open educational resources; establish policy frameworks that support accessibility and affordability;

collaborate with the private sector; and ensure strong cybersecurity and support for learners with disabilities. If well managed, digitalization promises to enhance the quality, relevance, and global competitiveness of Nigerian tertiary education, making it more resilient, inclusive, and future-oriented.

**Keywords:** digitalization; tertiary education; ICT integration; access; infrastructure; Nigeria; policy; challenges

## 12.1.    Introduction

The digitalization of tertiary education in Nigeria has emerged as a transformative force, reshaping the way knowledge is delivered, accessed, and managed across universities, polytechnics, and colleges of education. As the world increasingly relies on technology for innovation and growth, Nigerian higher institutions are gradually embracing digital tools to modernize their operations and align with global educational standards. Digitalization in this context refers to the integration of information and communication technologies (ICTs) into teaching, learning, research, administration, and student support services. This shift has proven to be more than a trend; it is a necessity for preparing students for the demands of a digital economy and for strengthening the capacity of institutions to remain relevant in a fast-changing world.

The benefits of digitalization in tertiary education are multifaceted. For students, it enhances access to quality learning materials through online libraries, e-books, and digital platforms, thereby reducing barriers created by inadequate physical resources. It also promotes flexible learning, allowing students to study at their own pace and engage in virtual classrooms regardless of location. For lecturers and researchers, digital tools provide opportunities for innovation in pedagogy, online collaboration, and access to global research databases that enrich the quality of scholarship and teaching. Administratively, digitalization simplifies record-keeping, admission processes, result computation, and communication between students and management, thus promoting efficiency, transparency, and accountability.

Moreover, the digital transformation of tertiary institutions plays a critical role in bridging Nigeria's educational gap with the rest of the world. It prepares graduates with the digital literacy skills needed in the 21st-century workplace and opens opportunities for international collaborations through online conferences, exchange programs, and cross-border research partnerships. Beyond individual benefits, digitalization also contributes to national development by fostering innovation, entrepreneurship, and workforce readiness.

Despite these numerous advantages, the digitalization of tertiary education in Nigeria is not without challenges. Issues such as inadequate infrastructure, unstable electricity supply, limited internet access, insufficient ICT skills, and financial constraints continue to slow down the pace of

adoption. Nevertheless, the undeniable benefits of digitalization make it a strategic pathway for improving the quality, accessibility, and global competitiveness of Nigeria's higher education system.

This chapter examines the various benefits of digitalization in Nigerian tertiary education. The chapter is discussed under the following subhead: concept of digitalization, concept of tertiary education digitalization, benefits of tertiary education digitalization, challenges and sustainable strategies to enhance tertiary education digitalization in Nigeria.

## 12.2. Clarification of concepts
### i. Digitalization

Digitalization is the process of leveraging digital technologies to transform a school business model, creating new teaching and learning model and value-producing learning opportunities for students. This involves integrating digital tools and systems into various aspects of a school business's operations, from management and communication to production and customer service. In today's school environment, digitalization has become essential for teaching and learning to thrive. It enables educational institutions to adapt to rapidly changing school environment, meet parent and students' expectations, and optimizing school resources processes for greater efficiency and productivity. Using digitized information, digitalization is the process of making workflows and processes easier and more efficient (Walkme 2022). Bejinaru, (2019) viewed digitalization as the conversion of text, pictures, video, and music into digital format utilizing technologies such as a laptop computer, the internet, mobile devices, a scanner, a digital camera, a projector, and a printer, among others, that may be played by a computer. Digitization is the conversion of materials created in another format into an electronic form; this definition excludes materials that were initially created digitally, such as email communication (Kannappanava; Rajamkanta & Tandur 2010).

Digitalization is the act of transforming information data into digital format for easy transmission that support effectiveness and efficiency in service delivery in an organization. Digitalization involves the process of converting analog information into digital formats through the use of digital tools to enhance services delivery in organization. Digitalization in education is the process of utilizing digital technologies to practically implement the school curriculum. Digitalization involves moving from manual model of carrying out services into digital model by deploying technological resources (Ogunode, Ayoko, & Orifah, 2023). Digitalization in education is the movement of teaching, learning and other educational services from manual format to digital format to enhances effective teaching, learning and improved service delivery in the schools. Digitalization in education is the process that involve conventional from manual teaching,

learning, researching into digital model that facilitate effective delivery of teaching, researching and improved learning outcome (Ogunode, Abdulrazak, & Abubakar (2023).

### ii. Digitalization of Tertiary Education

Digitalization of tertiary education refers to the integration and use of digital technologies to transform teaching, learning, research, and administrative processes in universities, polytechnics, and colleges of education. It goes beyond simply introducing computers or internet access—it is about rethinking and restructuring the entire educational ecosystem to leverage technology for greater efficiency, accessibility, and innovation.

## 12.3. Key Dimensions of Digitalization in Tertiary Education
### i. Teaching and Learning

Adoption of e-learning platforms, virtual classrooms, and digital libraries. Use of multimedia tools, artificial intelligence (AI), and virtual/augmented reality (VR/AR) to create interactive and personalized learning experiences. Blended learning models that combine face-to-face and online instruction.

### ii. Assessment and Evaluation

Online examinations, quizzes, and computer-based testing. AI-driven assessment tools that provide instant feedback and adaptive learning paths.

### iii. Administration and Management

Deployment of digital platforms for admissions, registration, fee payment, and transcript processing. Use of big data and analytics for decision-making, student tracking, and resource allocation.

### iv. Research and Collaboration

Access to online databases, journals, and collaborative research platforms. Cloud computing and digital repositories for data storage and knowledge sharing.

### v. Student Services and Engagement

Digital counseling, career guidance, and mentoring platforms. Use of social media and apps for communication, networking, and student support.

### vi. Inclusion and Access

Expanding education opportunities to remote learners through online programs and open educational resources (OER). Reducing barriers for people with disabilities through assistive technologies.

### 12.4. Benefits of Digitalization of Tertiary Education

The digitalization of Higher Education cannot be overstressed. It has a lot of benefits to the growth and development of higher education in Nigeria and elsewhere. The benefits are listed and discussed herein according Obikeze, (2021).

i. **Increases teacher ability to teac:** It gives teachers the ability to offer tailored learning plans and curricula to a single student. In the past, instructional strategies and methodologies were more or less designed with whole classes in mind.

ii. **Accessibility:** Digital learning breaks down geographical barriers, allowing individuals to access education resources from anywhere with an internet connection.

iii. **Flexibility:** Through digitalization of education, learners can customize their learning experience to fit their schedules, enabling them to balance work, family and education more effectively.

iv. **Creativity:** Digital Learning foster creativity and give students sense of success, encouraging additional learning by thinking outside traditional techniques.

v. **Assessment and Feedback:** Digital Learning platforms facilitate real-time assessment and feedback, providing immediate insight into students' comprehension and progress.

vi. **Breath of Information:** Digital Learning taps into the easy access to information and helps students to use it effectively. A good digital learning strategy also teaches students how to be objective when searching the internet for information.

vii. **More Engaging Lessons:** Digital Learning offers a large range of delivery methods for learning Imagery, audio and videos content can all be integrated seamlessly into a lesson.
Some teachers are even able to find software that enhances the topic they are teaching in the form of games. All these help to make learning more fun, which in turn will raise the retention of the content taught in the lesson.

viii. **Develops Accountability:** Digital Learning helps students to foster ownership over their education. If they do not know why the sky is blues, they have all the technology and resources to find it out themselves.

ix. **. Recorded Content:** Many who have experienced online lesson will say how valuable it is that some of the lessons are recorded. It's easy to understand why. If you miss something in the lesson, you can just rewind and catch that point later. It also enables learners to do additional study in their own time to catch up.

x. **Cloud-Based Learning Opportunities:** The cloud offers students and teachers the chance to select from virtually anywhere. They can use these types of applications while sitting in a lecture hall in person, from home, or even halfway around the world.

They enable the streaming of lectures, thus making online classes possible and attractive.

xi.    **Virtual Reality:** Virtual Reality has become an increasingly important components of technology across all sectors. Although it was initially used as a form of entertainment, it has also attracted attention for its potential and in training sequences or even shopping. In the world of education, where reality can provide students with the chance to experience the material they learn before they actually move into real world applications.

xii.    **Big Data:** Big data refers to the growing technologies capabilities to track large amounts of data and interpret it with the assistance of algorithm to find patterns and helpful information. Schools have long collected a wealth of information about their students, including their demographics, grade, and classes. Big data provides them with the opportunity to take their information much further and use it to better understand student trends and successes. This includes the convergence of a variety of different sources of data (Obikeze, 2021).

## 12.5.. Problems of Digitalization of Tertiary Education

The six major problems facing the digitalization of tertiary education in Nigeria:

i.    **Limited Access to Technology and Internet Connectivity:**

One of the biggest obstacles to digitalization of tertiary education in Nigeria is the limited access to technology and internet connectivity. Many students and educational institutions do not have the necessary resources to support digital education. Limited access to technology and internet connectivity has been a major problem facing the digitalization of tertiary education in Nigeria (Ogunode, 2025). This issue has greatly hindered the progress of modernizing the education system in the country. Without adequate access to technology and the internet, students are unable to fully engage in online learning, access educational resources, and participate in virtual classrooms. This has also affected the quality and accessibility of education, especially for students in rural and underprivileged areas (Onyia, 2020)..

i.    **Inadequate Infrastructure:**

The lack of proper infrastructure such as stable power supply, well-equipped computer laboratories, and high-speed internet connection, makes it difficult for institutions to fully embrace digitalization. This hinders the development and delivery of online education. Inadequate infrastructure includes inadequate computer facilities, internet access, and power supply in tertiary institutions (Pioneerschool, 2023; Jagboro, Omotayo, & Aboyade, 2012; Jegede & Abashi, 2019). These are crucial components that are necessary for the smooth implementation and functioning of digitalization in the education sector. Without proper infrastructure, students and faculty are

unable to fully utilize digital tools and resources, leading to a subpar learning experience. This issue is particularly challenging in Nigeria, where the education system is already facing various challenges such as underfunding and a large student-to-teacher ratio. As a result, digitalization efforts in tertiary education have been slow and limited (Ogunode, & Ndayebom, 2023; Carpe, 2020)).

ii.    **Resistance to Change:**

Many educational institutions and instructors are resistant to change and prefer traditional teaching methods. This resistance to adapt to digital education has slowed down the progress of digitalization in Nigeria. The resistance to change is a major problem faced during the digitalization of tertiary education in Nigeria. This challenge stems from the fact that many stakeholders in the education system are hesitant to adapt to new technology and methods. This resistance hinders the effective implementation of digitalization, leading to slower progress and limited impact (Ogunode, Ayoko, & Orifah, 2023 Dada, Atobauka, & Ogunode, 2022). One of the main reasons for this resistance is the lack of awareness and understanding of the benefits of digitalization in education. Many individuals, including students, teachers, and administrators, are not fully aware of the transformative potential of digital tools and are therefore reluctant to embrace change (Ding, 2000). Additionally, the lack of resources and infrastructure in Nigeria's tertiary education system poses a significant hurdle to successful digitalization. Without proper facilities and equipment, it becomes challenging to implement digital tools and technologies effectively (Solutionshub 2020). This further contributes to the resistance to change and slows down the process of digitalization. Moreover, there is also a lack of training and support for educators to learn and utilize digital tools in their teaching methods. This leads to a gap between the potential of digitalization and its actual implementation in the classroom. As a result, many teachers are resistant to incorporating technology into their teaching methods, which hinders the overall progress of digitalization in tertiary education.

iii.    **Lack of Trained Personnel:**

There is a shortage of trained personnel in digital education in Nigeria. This makes it difficult to effectively implement and manage digital education programs in institutions. Lack of trained personnel is a significant issue that is obstructing the digitalization of tertiary education in Nigeria (Ogunode, Abdulrazak, & Abubakar, 2023). This problem has been a major challenge for educational institutions in the country, as it is hindering the progress and development of digital learning initiatives. One of the primary issues with the lack of trained personnel is the difficulty in implementing and maintaining digital education systems. Without trained personnel, it is challenging to ensure that the technologies are used effectively and efficiently. This leads to a lack of proper utilization of resources and a decrease in the quality of education provided. Furthermore, this problem also affects the students directly. Without trained personnel, it is challenging to design and implement effective digital learning methods and resources (Salguero, Benites, Salguero,

Orosco, Orosco, & Vega, (2024). This results in a lack of engagement and motivation among students, making it difficult for them to learn and excel. Moreover, the lack of trained personnel also impacts the overall development of the education sector in Nigeria. Without a skilled workforce, it is challenging to keep up with the constantly evolving digital landscape and implement new technologies. This prevents the education sector from progressing and staying at par with global standards (Rodríguez, et al 2024)..

**High Cost:**

The cost of implementing and maintaining digital education infrastructure is a major issue in Nigeria. Many institutions cannot afford to invest in the necessary technology and resources for digital education. The high cost of implementing digitalization in tertiary education is a prominent problem in Nigeria. This issue is a significant hindrance to the modernization of education in the country (Obikeze, 2021). The introduction of technology into education requires a considerable amount of capital investment, which is challenging for the Nigerian government given its limited resources. Moreover, the cost of digital infrastructure, such as computers, tablets, and high-speed internet, is also a major barrier to the successful implementation of digitalization in tertiary education. These costs are often passed onto students, making education inaccessible for those coming from low-income families (Vidal, 2023).. The high cost of digitalization also affects the quality of education in Nigeria. It limits the ability of institutions to invest in modern teaching methods, training for faculty, and the development of innovative digital content. As a result, many students miss out on the opportunity to receive a high-quality education that can prepare them for the modern workforce (Walkme 2022).

iv. **Internet Security Issues:**

With the increase in cybercrime and internet security threats, institutions may be reluctant to fully embrace digital education due to the risk of data breaches and cyber-attacks. The adoption of digital technology in tertiary education has brought about numerous benefits, from increased access to educational resources to improved collaboration and communication among students and faculty. However, these advancements have also raised significant concerns over internet security issues. In Nigeria, such problems pose a major threat to the successful digitalization of tertiary education. With the growing reliance on online platforms for academic activities, it is imperative to address these challenges in order to ensure the sustainability of digitalization in the education sector (Olatunde-Aiyedun, Eyiolorunse-Aiyedun, & Ogunode, 2021). The issue of cyber attacks and data breaches is a major concern for tertiary institutions in Nigeria. Hackers are constantly finding new ways to exploit vulnerabilities in the system, putting valuable data at risk. This not only compromises the confidentiality of academic information but also jeopardizes the integrity of the education system as a whole. Another pressing concern is the prevalence of online scams and fraud targeting students. With the rise of online learning, many fraudulent individuals are taking advantage of unsuspecting students, promising them academic services in exchange for money.

This not only exposes students to financial loss but also undermines the credibility of digitalization in tertiary education. Moreover, there is a lack of awareness and understanding of internet security among students and faculty in Nigeria. Many are not aware of basic security measures that need to be taken to protect themselves and the institution from cyber threats. This further exacerbates the problem and makes the education sector more vulnerable to attacks (Olatunde, Ogunode, & Eyiolorunse, 2021).

## 12.6. Sustainable Strategies to improve Digitalization of Tertiary Education

The sustainable digitalization of tertiary education in Nigeria is an important aspect that requires careful consideration and planning. In order to improve digitalization in this sector, I would recommend the following strategies:

i. **Investment in infrastructure:**

The first step in achieving sustainable digitalization is to invest in the necessary infrastructure. This includes building and maintaining high-speed internet connections, providing adequate power supply, and equipping educational institutions with the necessary hardware and software.

ii. **Implementation of e-learning platforms:**

E-learning platforms are an essential component of digitalization in tertiary education. These platforms allow for the delivery of online courses and allow students to access educational materials from anywhere, at any time. By implementing these platforms, we can improve access to education and promote lifelong learning.

iii. **Training and development of educators:**

An effective digitalization strategy also involves training and development of educators. This includes providing them with the necessary skills and knowledge to effectively use technology in the classroom, as well as keeping them updated on the latest digital tools and techniques.

iv. **Collaboration with technology companies:**

Collaborating with technology companies can bring new and innovative ideas to the table. It can also help in acquiring the necessary resources and expertise to implement sustainable digitalization strategies.

v. **Encouraging open access and sharing of resources:**

By promoting open access to educational resources, we can improve the availability and quality of materials for students. This can also reduce the cost of education and promote collaboration among institutions.

vi.    **Engaging students in the digitalization process:**

It is important to engage students in the digitalization process. This can include seeking their feedback and suggestions, involving them in the development and implementation of new technologies, and promoting a culture of digital literacy among them.

By implementing these sustainable strategies, we can improve the digitalization of tertiary education in Nigeria and pave the way for a brighter future for our students.

## Conclusion

In conclusion, the digitalization of tertiary education in Nigeria represents a crucial pathway toward modernizing the nation's higher education system, enhancing quality, and expanding access to knowledge. By integrating digital tools into teaching, learning, research, and administration, Nigerian tertiary institutions can overcome long-standing challenges such as limited infrastructure, inadequate learning resources, and inefficiencies in management. However, the success of this transformation depends on addressing key obstacles, including poor internet connectivity, unstable power supply, high costs of digital technologies, and the digital divide among students and staff.

With sustained government investment, institutional commitment, and collaboration with the private sector, digitalization can foster innovation, improve academic outcomes, and align Nigerian tertiary education with global best practices. Ultimately, embracing digitalization will not only strengthen the competitiveness of Nigerian graduates but also position the country's higher education sector as a vital driver of national development in the digital age.

## Revise Questions

1. Define Digitalization

2. What is Digitalization of Tertiary Education?

3. List five Benefits of Digitalization of Tertiary Education

4. Discuss four Problems of Digitalization of Tertiary Education

5. Explain five Sustainable Strategies to improve Digitalization of Tertiary Education

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# AUTHORS' BIBLIOGRAPHY

international and local conferences and participated in many research activities in addition to publishing in both local and international journals. Dr. Usman also contributed chapters in more than five different text books so far and is a Senior Lecturer in the Department of Sociology, Federal University of Lafia-Nasarawa State.

**CHAPTER ONE:**

## AN ASSESSMENT OF THE CONTRIBUTIONS OF WEST AFRICA TERTIARY INSTITUTIONS TO THE DEVELOPMENT OF WEST AFRICA COUNTRIES

**Authors:**

**Ogunode Niyi Jacob, Ph.D.**

Department of Educational Management, Faculty of Education, Federal University Wukari, Taraba State, Nigeria

**About the Authors:**

*Ogunode* Niyi Jacob, Ph.D., a professional educational planner and an administrator. Ogunode Niyi Jacob Ph.D. have written many articles and conference papers on education especially educational planning, educational administration and management in Nigeria, Tertiary education, ICT education, Green Education, Gender Education, Artificial intelligence and special education. Ogunode Niyi Jacob is currently a staff with Federal University Wukari, Taraba State, Nigeria. He graduated from the famous university of Abuja. He has Master and Ph.D. in Educational Administration and Planning.

**CHAPTER TWO:**

## IMPACT OF RAPID GROWING POPULATION ON THE INFRASTRUCTURE IN NIGERIA

**Authors:**

**Usman Ibrahim, Ph.D.**

Department of Sociology, Faculty of Social Sciences, Federal University of Lafia, Nasarawa State, Nigeria

**About the Author:**

*Dr. Usman* Ibrahim holds Ph.D., MSc and BSc in Sociology from the Department of Sociology, Bayero University Kano, where he was a Lecturer before moving to the Department of Sociology, Federal University of Lafia, Nasarawa State-Nigeria. Dr. Usman taught at all level of Nigerian education from Primary School Teacher in Awe Local Government Education Authority to Nasarawa State Ministry of Education (Teachers Service Commission) as Secondary School Teacher and finally to university. His area of specialization in Sociology is demography, population studies and social statistics with main interest in fertility and reproductive health and its associated social problems. He has attended so many

**CHAPTER THREE:**

## ROLE OF TERTIARY INSTITUTIONS IN FISH PRODUCTION DEVELOPMENT IN NIGERIA

**Authors:**

**Oyekanmi, Funmilayo Bosede, Ph.D.**

Department of Fisheries and Aquaculture, University of Ilesa, Osun State, Nigeria

**About the Author:**

*Oyekanmi* Fumilayo Bosede is a distinguished academic and fisheries scientist with over three decades of experience in teaching, research, and academic administration. She began her academic career in 1989 as a Senior Instructor at the College of Agriculture, Mokwa, and now a Reader in the Department of Fisheries and Aquaculture, University of Ilesa, Osun State. Her areas of specialization include aquaculture nutrition, fish farming systems, freshwater prawn ecology, and environmental impacts on aquatic productivity. Dr. Oyekanmi has contributed extensively to the academic community through numerous publications in reputable national and international journals, and conference proceedings. Her research has attracted grants, including international funding from Zoetis Pharmaq SA and TETFund IBR. She is a Fellow of the Strategic Institute for Natural Resources and Human Development (FRHD), and holds membership in several professional bodies including FISON, WAS, ANIFS, and NIAS. Her work has been recognized with multiple awards for academic excellence and nation-building contributions, she remains committed to advancing sustainable fisheries practices, mentoring young scholars, and promoting gender inclusiveness in agricultural research and development in Nigeria and beyond.

**CHAPTER FOUR:**

## FACTORS THAT WILL ENHANCE DEVELOPMENT OF CAREER SERVICE CENTRES IN NIGERIAN TERTIARY INSTITUTIONS

**Authors:**

1. **Mary Adanna Chinwuba, Ph.D.** – *Lead Author*
   Executive Director, Chalcedony Schools; National Association of Proprietors of Private Schools (NAPPS), Abuja

2. **Adamu Awwal Salman**
Kogi State College of Education, Ankpa, Nigeria

**About the Authors:**

*Dr. Mary* Adanna Chinwuba. She graduated with a 2.1 in Biochemistry from the Federal University of Technology Owerri, after which she proceeded to obtain a Post Graduate Diploma in Education, then Masters in Educational Administration and Planning and Doctor of Philosophy (Ph.D.) in Guidance and Counselling from the prestigious University of Abuja. She has published over 25 Academic Journals online and has featured in so many international conferences. She is a renowned educationist and the Executive Director of Chalcedony Schools. She is a certified member of Association of Professional Counsellors of Nigeria (APROCON), Secretary of National Association of Proprietors of Private Schools (NAPPS Kubwa Satellite), A Licensed and professional teacher with TRCN, She is a trainer and coach to a lot of teachers. She is a genuine lover of God, she is married to Pastor Chibuzo Chinwuba and they are blessed with 2 beautiful daughters.

*Adamu* Awwal Salman is a distinguished educational psychologist with a B.Ed from Bayero University Kano and an M.Ed from Nasarawa State University. He is a staff member at Kogi State College of Education, Ankpa. Adamu Awwal Salman has authored numerous articles and conference papers on topics including educational psychology, gender, artificial intelligence, tertiary institutions, ASUU, and educational administration. He also holds roles such as Secretary of the Akus Educational Foundation, Ankpa, and Secretary of the Economic Tree Management Committee at Kogi State College of Education, Ankpa, Director of the College of Arts, Science and Islamic Studies (CASIS) reflecting his commitment to education and community development.

## CHAPTER FIVE:

### TERTIARY INSTITUTIONS IN NIGERIA AND CRIME MANAGEMENT STRATEGIES

**Authors:**
**Danyawo Musa Adamu, Ph.D**.
Department of Criminology and Security Studies, Faculty of Social Sciences, Federal University of Lafia, Nasarawa State, Nigeria

**About the Author:**
*Danyawo* Musa Adamu, Ph.D., a professional lecturer with the Department of Criminology and Security Studies, Federal University of Lafia. Danyawo Musa Adamu Ph.D. has written many articles and conference papers on criminology, especially educational planning, educational administration in Nigeria, the role of ICT in administration, and Artificial Intelligence. Danyawo Musa Adamu is currently a staff with Federal University of Lafia, Nasarawa State, Nigeria. He graduated from the University of Maiduguri. He has a Master's in Sociology and a Ph.D. in International Studies. Dr. Danyawo Musa Adamu is a lecturer in the Department of Criminology and Security Studies, in the Faculty of Social Sciences, Federal University of Lafia, Nasarawa State. He is a member of Association of Professional Councilors of Nigeria. He is an academician par excellence and a professional lecturer who has published in a number of academic journals, contributed to chapters in books, and continues to impact knowledge in Criminology and Security Studies as well as Change and Innovation in the Educational System.

## CHAPTER SIX:

### GAMIFICATION IN SCIENCE EDUCATION IN NIGERIA

**Authors:**
1. **Olamoyegun, Stephania Olabisi, Ph.D.** – *Lead Author*
Department of Science Education, University of Abuja, Nigeria

2. **Ola-Adeniji Elizabeth Bolarinwa**
Department of Science Education, University of Abuja, Nigeria

**About the Authors:**
*Stephania* Olabisi Olamoyegun (Ph.D.) is a science educator and Chemist with 15 years of teaching experience at senior secondary school. She holds a degree in Chemistry Education from University of Uyo, Masters and Ph.D. in Science Education from University of Abuja. Her work focuses on improving the teaching and learning of science. She has published scholarly articles on teacher preparation, students' misconceptions in science, and the integration of digital learning tools in classrooms. With years of experience teaching at the university level, Dr. Stephania is committed to bridging the gap between research and classroom practice. She has served as a mentor for pre-service and in-service science teachers. Her current research interests include curriculum innovation, psychosocial factors of interest, self-efficacy, and learning environment on achievement in Basic Science among Junior Secondary School Students in North Central Nigeria, and the role of technology in advancing science education in Nigeria.

*Ola-Adeniji* Elizabeth Bolarinwa is a distinguished educator and chemist with a decade of teaching experience. Born with a passion for science and

education, Elizabeth has established herself as a dedicated and accomplished professional in her field. Elizabeth holds a Bachelor's degree in Applied Chemistry from Usman Danfodio University. She furthered her education by obtaining a Postgraduate Diploma in Education (PGDE) from the National Open University. Her academic pursuits culminated in a Master's degree from the University of Abuja. With a strong foundation in chemistry and education, Elizabeth embarked on a teaching career that has spanned over ten years. Her dedication, expertise, and commitment to excellence have made her a respected and beloved educator among her students and peers. Throughout her career, Elizabeth has demonstrated a tireless passion for inspiring and mentoring young minds. Her contributions to the field of education have been significant, and her legacy continues to inspire future generations of scientists, educators, and leaders.

## CHAPTER SEVEN:
### TERTIARY INSTITUTIONS IN NIGERIA AND HUMAN MANAGEMENT STRATEGIES

**Authors:**
**Olapade Olubunmi Olayinka**
Department of Human Resources and Administration, Nigeria Airspace Management Agency (NAMA), Nigeria

**About the Author:**
*Olapade* Olubunmi N. Olayinka is an experienced Public Administrator and Human Resource professional with a strong academic background, including a Master's degree and a Postgraduate Diploma in Public Administration. Currently serving at the Nigeria Airspace Management Agency (NAMA), Olubunmi has held various key roles since 2012, including Head of the Environment Unit and Officer in charge of the Office and Housing Unit. Her work spans administrative coordination, human resources, environmental management, and project oversight. A Fellow of the Chartered Institute of Human Resources Management and Member of both the Nigerian Institute of Management and the Chartered Institute of Personnel Management, she combines professional expertise with a passion for leadership and service. Olubunmi is also active in community development, particularly in women and youth-focused initiatives. Her core values are integrity and professionalism.

## CHAPTER EIGHT:
### TERTIARY INSTITUTIONS AND COMMITTEE SYSTEM IN NIGERIA

**Authors:**
**Sani Kasimu, Ph.D.**
Department of Public Administration, Faculty of Management Sciences, Federal University Wukari, Nigeria

**About the Author:**
*Dr. Sani* Kasimu holds a B.A. in Public Administration (2011), M.Sc. in Public Administration (2016), PGD in Economics & Statistics (2019), and Ph.D. in Public Administration (2024) from Ahmadu Bello University (ABU), Zaria, Nigeria. He is a Senior Lecturer with the Department of Public Administration, Faculty of Management Sciences, Federal University Wukari. His areas of interest include Public Financial Management, Public Sector Accounting, Statistics, Econometrics, Public Debt Management, Development Administration, Strategic Planning and Management, Project Management Analysis, and Public Policy Analysis.

## CHAPTER NINE:
### TERTIARY EDUCATION AND ACCREDITATION OF ACADEMIC PROGRAMMES IN NIGERIA

**Authors:**
**Inemesit Nsikak Edet**
Assistant Chief Education Officer, Federal Ministry of Education, Abuja, Nigeria

**About the Author:**
*Inemesit* Nsikak Edet is a post-graduate student currently pursuing a Ph.D. degree in Educational Administration and Planning at the University of Abuja, Nigeria. She holds a Bachelor's degree in Science Education and a Master's Degree in Educational Administration and Planning, among other professional certifications. She currently works with the Federal Ministry of Education as the Assistant Chief Education Officer. She taught Sciences in Federal Government Boys' College Abuja specializing in Biology. She is a member of the Teachers Registration Council of Nigeria and the Local School Board, Living Faith Church Worldwide.

## CHAPTER TEN:
### TERTIARY EDUCATION AND COMMUNITY SERVICE PROGRAMME IN NIGERIA

**Authors:**
**Nwankwo Nkechi Chinelo, Ph.D**.
Department of Educational Management and Planning, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria

**Unachukwu Ijeoma Blessing, Ph.D.**

Department of Economics Education, Federal College of Education (Technical), Umunze, Nigeria
Email: ijeoma.unachukwu@fcetumunze.edu.ng

**About the Author:**
*Nwankwo* Nkechi Chinelo, Ph.D., is a distinguished educational administrator, planner, and researcher. Dr. Nwankwo has authored numerous articles and conference papers in the fields of educational administration, planning, and management, anxiety management, tertiary education, and artificial intelligence. She holds a Ph.D. in Educational Management and Planning from Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State. She is an active member of the Nigerian Association for Educational Administration and Planning (NAEAP), Association of Educational Management and Policy Practitioners (AEMPP), and Forum for African Women Educationist (FAWE).

## CHAPTER ELEVEN:
### TERTIARY EDUCATION AND COMPUTER-BASED TEST IN NIGERIA

**Authors:**
**Unachukwu Ijeoma Blessing, Ph.D.**
Department of Economics Education, Federal College of Education (Technical), Umunze, Nigeria
Email: ijeoma.unachukwu@fcetumunze.edu.ng

**Nwankwo Nkechi Chinelo, Ph.D**.
Department of Educational Management and Planning, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria

**About the Author:**
*Dr. Unachukwu* Ijeoma Blessing is a lecturer in the Department of Economics Education at Federal College of Education (Technical), Umunze. She holds her Bachelor's degree, Masters of Science (MSc), and Ph.D. in Economics (Development & Labour Economics). She is a researcher, analyst, and critical thinker, with excellent communication and human development management skills. Dr. Unachukwu has published many papers in reputable local and international journals. She is currently the Head of Department in the Economics Department at Federal College of Education (Technical), Umunze. She is an active member of the Nigerian Economic Society (NES) and the Nigerian Economic Society of Female Professionals (NESFP).

## CHAPTER TWELVE:
### DIGITALIZATION OF TERTIARY EDUCATION IN NIGERIA: BENEFITS, PROBLEMS AND SOLUTIONS

**Authors:**
1. **Christopher Idowu Ojo** – *Lead Author*
   Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

   *Phone: 08133154731*
   **Email**: christopherojo70@gmail.com

2. **Temitope Zulfah Mustapha**
   Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

   *Phone: 08039171701*
   **Email:** temitopemustapha29@gmail.com

3. **Emeana Geraldine Chinwe**
   Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

   *Phone: 08033752432*
   **Email:** jaygreg2003@gmail.com

**About the Authors:**
*Christopher* Idowu Ojo, a professional educational planner and an administrator. Christopher Idowu Ojo has written several articles and conference papers on education especially educational planning, educational administration and management in Nigeria, tertiary education, and ICT education. Christopher Idowu Ojo is currently a staff with University of Abuja, Nigeria where he also graduated from. He has a Master's and Ph.D. (in view) in Educational Administration and Planning.

*Temitope* Zulfah Mustapha is an Educational Strategist and Media Education Expert. She has written many reports, articles, and seminar papers on education—especially on educational administration and management, basic education concerns, inclusive education, tertiary education, ICT education, gender education, and special education. She is presently a staff with the Voice of Nigeria, where she heads the Education Desk and has served for 13 years. She

graduated from the University of Ilorin and has a Master's and Ph.D. (in view) in Educational Administration and Planning.

*Emeana* Geraldine Chinwe is a seasoned Administrator and currently an Assistant Director/Admin with the National Film & Video Censors Board (NFVCB), Abuja. She has held different administrative positions and is currently in charge of Appointment, Promotion, and Discipline. She is also a member of the NFVCB Media Literacy Campaign Team that educates and carries out enlightenment campaigns on film matters. Emeana Geraldine C. is a professional Educational Planner and a fellow of the Chartered Institute of Human Resource Management (FCIHRM). She graduated from the University of Nigeria, Nsukka, and the University of Abuja, Nigeria, and is presently pursuing her Ph.D. in Educational Administration and Planning at the University of Abuja, Nigeria.

## CHAPTER THIRTEEN:
### DEPLOYMENT OF ARTIFICIAL INTELLIGENCE FOR FRAUD DETECTION AND PREVENTION IN TERTIARY EDUCATION IN NIGERIA

**Authors:**
**Victor Olugbenga Ayoko**
Department of Educational Foundations, Faculty of Education, National Open University of Nigeria
Email: victorayoko@gmail.com

**About the Author:**
*Victor* Olugbenga Ayoko is a research scholar in the Department of Educational Foundations, Faculty of Education, National Open University of Nigeria. He is a multidisciplinary scholar with qualifications across the faculties of science, management science, social science, and education. He is a member of the Open Distance and e-Learning Association of Nigeria (ODeLAN), the National Association of Educational Administration and Planners (NAEAP), and the Nigerian Economic Society (NES). He has published in several local and international journals, contributed to book chapters, and presented papers in relevant conferences. His areas of interest include school administration, sustainable development, economic development, and open and distance learning.

## CHAPTER FOURTEEN:
### DEPLOYMENT OF TECHNOLOGIES IN CURTAILING EXAMINATION MALPRACTICES IN NIGERIA TERTIARY EDUCATION

**Authors:**
**Galadima, Farida Ibrahim**
Department of Adult and Continuing Education, Federal University Wukari, Nigeria.

**JAE, Talatu**
Department of Educational Foundation, Taraba State University, Jalngo

**About the Author:**
Galadima Farida Ibrahim has a Master's Degree in Educational Administration and Planning and is currently pursuing a Doctorate in the same field. She is a lecturer with Federal University Wukari, Taraba State, Nigeria. She is a research scholar and has written many articles in education and beyond. Farida is a member of the National Association of Educational Administration and Planning (NAEAP).

## CHAPTER FIFTEEN:
### SMART RESEARCH IN TERTIARY EDUCATION IN NIGERIA: PROBLEMS AND SOLUTIONS

**Authors:**
1. **Maryam Abdullahi, Ph.D.** – *Lead Author*
   Department of Education, Nigerian Police Academy, Wudil, Kano, Nigeria

2. **Muhammad Danjuma Maiwada**
   Department of Education, Nigerian Police Academy, Wudil, Kano, Nigeria

**About the Authors:**
*Maryam* Abdullahi, Ph.D., is a professional educational psychologist. She has written many articles and conference papers on education, especially educational psychology, guidance and counseling, tertiary education, computer and ICT education, and special education. Maryam Abdullahi is currently a lecturer at the Nigerian Police Academy, Wudil, Kano, Nigeria. She graduated from Bayero University Kano for her first and second degrees and obtained her Ph.D. at Federal University Dutsin-Ma, Katsina State, Nigeria. She has a Master's and Ph.D. in Educational Psychology.

*Muhammad* Danjuma Maiwada is currently pursuing his Ph.D. at Bayero University, Kano. His research interests include Educational Psychology, Literacy in Education, Tertiary Education, Special Education, and

Guidance and Counseling. He serves as a Lecturer in the Department of Education at the Nigerian Police Academy, Wudil, Kano. Maiwada is dedicated to advancing knowledge and contributing to the academic community through his research endeavors. He earned both his Bachelor's and Master's degrees from Bayero University, Kano, with a Master's in Educational Psychology.

## CHAPTER SIXTEEN:
### TERTIARY EDUCATION IN NIGERIA AND CONFLICT MANAGEMENT STRATEGIES

**Authors:**
**Umoru Abdulrasheed Oseni**

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**About the Author:**
*Umoru* Abdulrasheed Oseni is a part-time lecturer in the Department of Educational Management, Faculty of Education, University of Abuja. He holds a Diploma in Accounting, B.Sc (Ed) Accounting, and an M.Ed in Educational Administration and Planning. He is currently working on his Ph.D. thesis in Educational Administration and Planning, all at the University of Abuja. Umoru Abdulrasheed Oseni has conducted many analytical and empirical research studies in educational leadership and management, published in reputable local and international journals. He is happily married with children.

## CHAPTER SEVENTEEN:
### TERTIARY EDUCATION AND FUNDING IN NIGERIA

**Authors:**
**Saleh Khalid Mahmud**

Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

**Email**: khalidmahmuh13@yahoo.com

**About the Author:**
**Saleh** Khalid Mahmud is a professional educational planner and administrator. He has written many articles and journals on education, especially educational planning, educational administration, and management in Nigeria, tertiary education, and ICT education. Saleh Khalid Mahmud is currently a Ph.D. student in the Department of Educational Management, Faculty of Education, University of Abuja, Nigeria. He earned his Master's degree in Educational Planning and Policy from the University of Ibadan, Nigeria.

## CHAPTER EIGHTEEN:
### AN ASSESSMENT OF THE IMPACT OF URBANIZATION ON LOCAL BIODIVERSITY

**Authors:**
**Ronald Winifred Abhulimen, Ph.D.**

Department of Biological Sciences, Faculty of Biosciences, Federal University Wukari, Nigeria

**Email**: ronaldwinifred@gmail.com

**ORCID iD**: 0009-0006-3670-4079

**About the Author:**
*Ronald* Abhulimen Winifred, Ph.D., is a distinguished wildlife ecologist with a Ph.D. from the University of Benin, Benin City, Nigeria. She is a Senior Lecturer in the Department of Biological Sciences, Faculty of Biosciences, Federal University Wukari. She has authored numerous articles and conference papers on the terrestrial and aquatic biodiversity of molluscs, arthropods, and aquatic macroinvertebrates fauna. She was awarded Best Departmental Lecturer in 2025 and serves as an Academic Board Member of ENE Health College, Wukari. She lectures both undergraduate and postgraduate students in Biological Sciences and has supervised many project works. Dr. Winifred is also a member of NES Taraba State Chapter (pioneer Financial Secretary, 2023/2024), as well as Unit Head of the Decoration Unit in her church, where she serves as a deaconess of God.