ANALYSIS OF THE EFFECTS OF IMPLEMENTING DIGITAL TECHNOLOGIES IN ADMINISTRATION OF HIGHER EDUCATIONAL INSTITUTIONS IN NIGERIA

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DOI: https://doi.org/**10.5281/zenodo.14739763**

Abstract: In many countries today, the use of ICT is increasingly being promoted to improve the quality of education at all levels of their educational system. Globally, the current techniques of educational development are changing as the days evolve. It has become apparent that reforms in contemporary higher education cannot succeed effectively without paying much attention to the use of ICTs, particularly when applying it in educational administration. This constant change is mainly determined by the integration of digital tools to advance the effectiveness of administration and management of educational practices in higher educational institutions. The use of ICT has become a vital pointer for almost all known activities. The use of these technologies in the administration of higher educational institutions is gaining ground. Researchers have acknowledged that ICT application has significant impacts on educational administration. In recent times, higher educational institutions have experienced an increase in the digitalization of administrative processes. These technologies are currently being applied in the following areas, such as management information systems (MIS), general administration, payroll and financial accounting, personnel records maintenance (Bosu, 2019), student records, virtual learning environments, data management which makes data always available, especially when artificial intelligence tools are employed (Beerkens, 2022). However, notwithstanding the beneficial roles of these technological devices in the education system as perceived by scholars, educators, administrators, and other stakeholders in the education sector, there are still major challenges posed by adopting these new technologies in educational administration, particularly in higher educational institutions. Consequently, this paper focuses on the benefits and the pitfall of integrating ICTs in the administration and management of higher educational institutions, specifically in Nigeria. It also aims to provide major solutions to ameliorate the envisaged obstacles facing the effective implementation of these new technologies in the administration and management of higher educational institutions.

Keywords: Digital Technologies, Higher education, ICT, Educational administration, and Digitalization.

Introduction

The positive role of information and communication technology in the administration and management of higher educational institutions is not in doubt. The success of any higher educational institution today depends on the effectiveness of its administration. These services embrace taking care of the institutions' accounts, organizing students' data, and the general administration, which encompasses the admission

processes through learning activities to processing and release of results. But these activities are better performed via the integration of Information and Communication Technologies (ICTs), which makes information freely accessible to individuals worldwide (Misra, Maskeliunas & Damaševičius (2018).

Hence, there is a need for all contemporary higher educational institutions' administrators and policy-makers to understand the importance of applications of ICTs to support the administrative processes. Education, according to UNESCO (2023), has remained a basic human right, which aims to guarantee comprehensive and unbiased quality education and promote lifelong learning opportunities for all, which in turn forms the foundation or bedrock for peace and sustainable development of any nation. In a technology-driven age like ours, particularly with the use of computers, it is becoming exceedingly challenging for societies to function successfully in various fields without a good knowledge of information and communication technology tools and skills.

In recent times, the integration of technological devices or tools in altering or changing higher education sector has attracted the attention of scholars in administration, management, and educational technology fields. The use of technology in the education industry is becoming very prominent, as many higher educational institutions, centers and professional bodies have started integrating ICT skills in their programmes. The higher institutions' administration generally is saddled with lots of challenges due to the traditional mode of operation, which requires modern approaches to reduce the envisaged administrative bottlenecks. The application of these modern technological devices to the administration of higher educational institutions has enhanced the administrative effectiveness of staff and generally strengthened the academic efficiency of students or learners.

According to Alenezi (2023), the use of these technologies are driven by numerous influences, such as digital transformation, online courses, digital-conscious students, and operational costs. Added to this is the demand of the present-day knowledge-age economy, and micro and nano degrees, increasing population of students in higher educational institutions (Bosu, 2019), and according to Chigozie-okwum (2019), the increasing demand for university education and continuous creation of new faculties to meet admission demands without corresponding increase in infrastructural and human resources to manage university affairs, which brings complexity to the system. Other significant range of drivers demanding the use of technology, according to Devlin & Samarawickrema (2022), Marshall (2018), and Wheaton (2020) include the economic and social impacts of the pandemic, shifting political priorities and relationships, changes in the expectations of education as it becomes more widely available, and the impact of technology itself.

Information and Communication Technologies are impacting on almost every aspects of the society, predominantly in the education circle, where new technologies have ushered in new ways of teaching and learning. It is currently transforming the conventional instructional techniques. Presently, the face-to-face instructional strategy is gradually losing its relevance due to digitalization of the education system. Most of the traditional information are progressively being digitized. The use of computers and other digital tools have made it possible to impute, store, process. and share information through electronic means. It has also provided unlimited access to invaluable information for both students and lecturers alike, and also improves the quality of students learning. The use of ICT has improved the democratization of education to the socially, physically, and

the low income earners in the societies. The use of simultaneous presentations, such as videos, applications and didactic images facilitates teaching, as it increases the involvement lecturers and students in teaching-leaning (Communication Team, 2023).

According to Okoli (2007), universities must be able to manage massive amounts of data processing to meet the information needs of different stakeholders, including the government, the information community, parents, alumni, students, and the general public, as well as to provide information for decision-making. Despite its significance, Jagboro (2003) explains why there is little ICTs use in universities is due to an increment in the funding of higher education with specific allocation to digital education development in all the higher educational institutions in the country. These include limited funding, a lack of considerable online learning materials, expensive costs associated with cyber cafés, poor levels of connectivity, and faculty pay for teaching remotely. In totality therefore, this paper focuses on the use of technologies in addressing various administrative issues in higher education in Nigeria for national development. It specifically mirrors into benefits and the pitfalls of technology integration in higher educational institutions in Nigeria. It also aims at providing major solutions to ameliorate the envisaged obstacles for effective implementation of the new technologies in higher education administration in Nigeria.

However, this paper aims to investigate the integration of information and communication technology in educational administration in Nigerian context and strengthen the ICT use in Nigerian higher education administration, believing that the results of this study would help teachers, policy-makers, non-teaching staff, and other education stakeholders to understand the importance of integrating ICT policies in refining educational administration in Nigeria. The paper would be a useful resource for future researchers hoping to learn more about the use of information and communication technology implementation in the enhancement of higher educational institutions' administration.

Literature Review
Definition of Terms

Digital Technologies: Egoeze et al. (2018) refers to digital technologies as tools that improve the administrative activities of higher education institutions and transform teaching methods. Digital technologies also refer to the use of social media tools, digital online platforms, and digital learning platforms (Nurtayeva, Kredina, Kireyeva, Satybaldin & Ainakul, 2024). Nurtayeva, et al (2024) have alsi categorized digital tools thus:

i. **Social media tools:** Instagram Facebook TikTok LinkedIn Twitter.
ii. **Digital online platforms**: Microsoft Teams Zoom Moodle Herro Study Google Meet.   Iii.
Digital learning platforms: Moodle Hero Study Front Platonus Sistema univer Wsp.Kz

   Canvas/

Educational Administration: Educational administration, as a field of study in public administration, can be described as the management of an educational organization or institution for the purposes of facilitating teaching, learning and research. It consists of the process of facilitating the designing of goals and policies that would stimulate the development of appropriate programmes for teaching, learning, procuring, as well as managing

personnel and materials to implement teaching and learning (CDLCE, n.d.). Moreover, administration can be defined as the intricate process of developing and carrying out policies to achieve a common goal. As a branch of public administration, educational administration studies the management of any institution or organization, whose goals are related to the education of the groups of people that comprise that organization (Kupoluyi & Awotunde, 2018). Additionally, Niah (2022) emphasized educational administration to be, "a process or effort to achieve an educational goal by taking into account various components of education so that it can improve the education system by utilizing various tools to support teaching and learning activities". Educational administration oversees the day-to-day operations of educational institutions to achieve their stated aim and objectives (Kashuyap, 2024).

Higher Education: Higher education refers to post-secondary education, third-level or tertiary education; it is a form of formal learning where education is provided by universities, colleges, graduate schools that leads to the award of an academic degree. Higher education is an optional final stage of formal learning that occurs after completion of secondary education (https://www.igi-global.com/dictionary/constructing-community-higher-education-regardless/13 094). Furthermore, higher education refers to the stage of learning that occurs at universities, colleges, polytechnics, colleges of education, advanced teachers training colleges, correspondence colleges and other institutions offering academic degrees and professional qualifications beyond the secondary education level (Ogunode & Ndayebom, 2023). It encompasses a variety of post-secondary education programs designed to provide advanced knowledge, develop critical thinking skills, and prepare individuals for professional careers or further academic research (ChatGPT, 2024). As Ogunode & Ndayebom (2023) put it, higher education is an education that is anchored on teaching, researching and community services.

ICT: Refers to Information and communication technologies; ICTs for short, are a broad category of technological resources and instruments used for information creation, sharing, storing, and management, as well as communication. The term Information and Communication Technologies encompasses a wider range of communication technologies, including but not limited to wireless networks, computers, mobile phones, software, middleware, social networking, videoconferencing, and other media applications and services. Additionally, according to Toro and Joshi (2012), ICT refers to technologies, such as computers, mobile phones, projectors and radio; they are a diverse set of technological tools and resources used to communicate, to create, disseminate, store and manage information.

Digitization: This refers to the process of digitizing, which is the transfer of analog materials, such as text, photos, and videos into digital format (The Oxford English Dictionary, 2019 and Oxford English Dictionary (2019a). Digitization has also been viewed as the translation of all kinds of information, such as text, audio, pictures, video, and other data from multiple sources into digital language (Machekhina, 2017). It also refers to the process of transforming or the converting of hard/paper files and documents into digital files and documents; it involves scanning a picture, uploading paper documents, or converting a report into PDF form and storing it on a computer. From the above, Ogunode and Ndayebom (2023) defined digitization as those facilities that aid the conversion of teaching and learning into platforms like online courses, online assessments, and web seminars/conferences or workshops through the use of electronic platforms. Digitization is when analog information or physical contents (paper, images, texts, or sound) are converted or

scanned into a digital format. That is to say, when a physical textbook or picture is scanned to create MP3 file or format, it is known as digitization.

Digitalization: Titus (2018), Olatunde-Aiyedun, Eyiolorunse-Aiyedun, & Ogunode (2021) hypothesized digitalization in education as the process of transferring traditional teaching and learning materials, such as online learning platforms, educational apps, and multimedia resources, online courses, online assessments, and web seminars and conferences, or workshops to electronic model for deployment in the school. The conversion of text, pictures, video, and music into digital format, utilizing technologies, such as laptop computer, the internet, mobile devices, scanner, digital camera, projector, and printer, among others, that may be played by a computer may also be described as digitalization (Bejinaru, 2019). According to ChatGPT (2024), it defined digitalization as the broader transformation of business processes through the use of digital tools; it is the use of digital technologies to improve businesses, models, and operations. Ogunode and Ndayebom (2023) further emphasized that digitalization is the process of transforming physical teaching and learning resources into packages or platforms or electronic forms where they can be stored and manipulated by a computer for the implementation of teaching and learning programmes in school.

Educational Management: As the name implies, educational management operates within the confines of educational institutions. As defined by Kashuyap (2024), it is a complex human enterprise in which different resources are brought together and made available to achieve and to accomplish the desire and expected goals or objectives. Educational Management focuses on the long-term aims and objective s of the educational institutions. educational management is a comprehensive effort intended to achieve some specific educational objectives, and it deals with the educational practices (Kashuyap, 2024). Additionally, educational management has also been defined by Soliman (2024) as a field, which is concerned with the operation of educational organizations; it is the process of planning, organizing and directing activities in a school, effectively utilizing human and material resources, in order to accomplish the school's objectives.

Generally, educational management involves planning, organizing, leading, and controlling educational resources to achieve specified goals (Soliman, 2024). Finally, Ali and Abdalla (2017) also refers to educational management as a five-step process to achieve organizational goals in education, and this process, according to the authors includes planning, organization, directing, coordination, and controlling activities.

Digital Institutions: Digital organizations are entities that have embraced digitalization and utilized digital technologies to transform their operations and achieve competitive advantage. These organizations recognize the potential of digitalization in reducing costs and increasing innovation.

General Merits of Integration Technologies in Higher Education Administration

There is no denial that higher educational institutions required to handle large bulk of data, which are processed to provide information for decision-making that will meet the information requirements of various stakeholders like the staff, students, government, parents, alumni, the institutions' communities, and the general public (Okoli, 2007). In view of the above, the 21st technological advancements have brought numerous changes to the nature and scope of administering and managing higher educational institutions globally. Currently, this has led most educational planners, policy-makers, and the stakeholders in the education industry to adopt strategies and

policies for ICT integration in higher educational institutions to ameliorate these challenges. Ogunode and Ndayebom (2023) acknowledged that digitization has the potential to transform the entire higher education system by making teaching, research and the provision of community service more efficient and fast; it can also increase access to teaching and learning, enhance flexibility, and improve the quality of higher education in Nigeria.

In fact, the policy of digitalization of instruction was seriously heightened or emphasized during the COVID-19 pandemic, which popularized the use of digital technologies in the education sector, whereby majority of schools worldwide were propelled to integrate ICTs in teaching-learning process, especially for those who could not physically attend classes (Adedoyin et al., 2020). Due to the pandemic, many educational institutions have shifted to online platforms (Bakator & Radosav, 2020). Irrespective of the fact that many schools demonstrated a lack of experience and little digital capacity that made it unbearable for many schools not to learn during the period, it thereby forced or gingered many school administrators and policy-makers today to adopt online learning to transform to modern learning styles that could not be fully achieved during the 2020 pandemic (Mseleku, 2020).

Yes, technology could be applied in a range of ways in teaching-learning process, principally in the administration of higher education institutions. This assertion has been affirmed by Nguyem (2023) when the scholar stated that ICT plays a significant role in educational administration in education systems across the world. Educational administration, according to Nguyem (2023), streamlines various administrative tasks, such as data storage, knowledge management, and decision-making processes. It has been said that ICT could be applied to learning, teaching, and assessment of individual students. This had been buttressed again by Onije & Opara (2013); the scholars opined that the integration of ICT in administrators' work can support educational activities. Additionally, Emmanuel (2024) affirmed that the impact of technology integration on administrative processes and decision-making revealed that institutions with high ICT integration levels exhibited increased efficiency and decision-making improvements.

Henderson (2020) further affirmed that the use of ICT in education adds value to teaching and learning, by enhancing the effectiveness of learning, increase the students' knowledge, helps them to think independently, communicate creatively and finally helps them build successful careers and lives in an increasingly technological world. According to Panji o"g"li (2023), one of the benefits of digitalization in higher education includes the transformation of teaching, which has revitalized the way teaching-learning is practiced, and has increased access to education, which provides learners with access to educational resources from anywhere globally, which has also altered the way the traditional education is formally practiced as students who are unable to attend traditional brick-and-mortar institutions due to financial, geographical, or personal constraints can now have flexible learning opportunities via online learning that allows them to study at their own pace and on their schedule.

Other scholars have also witnessed how rapid advancements of technologies have led to far-reaching developments in the administrative system of higher education institutions. In general, the integration of these new technologies in higher education administration have transformed and reduced the much talked about paper work, and it is gradually replacing the manual maintenance of administrative records to electronic maintenance of records, which invariable helps to access and easy retrieval of students and staff information within a limited timeframe, thereby making the administrators work more efficiently. As Henderson (2020) put it, integrating

technologies in higher education enhances the learning experiences of students, as it helps them to think independently, communicate creatively, building successful careers and lives.

The is no misgiving that the integration of technologies in the educational administration main stream had added efficiency due to automation of some administrative tasks. This is perfected by streamlines administrative tasks, such as admissions, registration, grading, and scheduling, and reducing manual workload. The use of ICT makes it possible to improve data management, such as storage, management or manipulation of data, and quick analysis of data for making informed decisions in higher education institutions. The integration of ICT in higher institutions of learning encourages collaborative works, as both the instructors and the students could interact with their peers beyond their geographical boundaries; students can easily organize their works; it can support different teaching methods, which invariably suits different learning styles of students (https://getrevising.co.uk/grids/ict_in_ education). One of the important merits of the use of ICT in higher educational institutions administration is that it is cost-effectiveness, as it minimizes cost, saves time and money.

Additionally, some educational software can save time and effort of students, and at the same time provide immediate feedback for students. According to Ogunode and Ndayebom (2023), the scholars stressed that online learning platforms can provide students with access to educational resources from anyplace in the world, especially to students who are incapable of attending traditional brick-and-mortar institutions due to financial, geographical, or personal constraints, and also provide students with more flexible learning opportunities, allowing them to study at their own pace and on their own timetable.

The use of ICTs enables quick information retrieval. The use of ICT tools makes it easier for research and information gathering, because numerous search engines, such as Google, Hotbot, Dogpile, Excite, MSN, Infoseek, Metacrawler, etc., are abound and make online materials or resources available to users in seconds with the click of the mouse on the computer keyboard. Digital or online libraries and databases have also made research much more effective and inclusive.

Another of the benefits of digitization is that it necessitates individuals to customize their learning experiences to suit their needs and learning styles. Ogunode and Ndayebom (2023) opined that digital technologies can allow learners or students to focus on areas where they need the most support and challenge themselves in areas where they excel, expressly with the help of today's educational applications with provide students with interactive and engaging learning experiences that are tailored to their individual needs and interests, which invariably enhances the performances of the students and raises the quality of education.

Again, academic testing is another benefit of using ICTs in higher educational institutions. The truth about it is that, in online testing, it is viewed to be impartial and entirely free and fair. Since the machine is involved in grading the test it's impossible to show any signs of bias (Ogunode & Ndayebom, 2023). Additionally, online testing has as well been acclaimed to be an excellent solution for those who suffer from test anxiety and are distressed by taking tests in a room with a group of other people. Ogunode & Ndayebom (2023) further stressed that testing is also better for those with busy schedules that struggle to be at a physical testing center at a particular time.

Still buttressing the importance of ICT in the administration in education at all levels, Palagolla and Wickramachchi (2019) studied the effective ICT applications and ICT management in secondary schools through the analysis of existing factors affecting the use of ICT, the results obtained from the study showed that the use of ICT had a significant and high impact on work efficiency, saving work resources, work quantity and quality, career goals achievement, improving students' outcomes, learning interest, and creativity.

In conclusion, if ICT is effectively applied in the administration of higher educational institutions in Nigeria and elsewhere in the world, it will enhance data management, improve communication, especially written, reduce paper work that is very much common with the conventional administrative setup, as well save the time spent on tasks for lecturers, students, the entire administrative personnel, and also gives room for a better and/or effective decision-making and implementation. Additionally, the use ICTs in higher educational institutions increases efficiency, reduces accuracy by limiting human errors, saves time and reduces cost by investing in cloud computing, which reduces much acquisition of physical equipment, which in turn reduces space.

Challenges Facing the Integration of Technologies in Higher Education Administration

As ICT has generally brought in so many benefits to human activities, so also has it brought untold problems, not only to humans, but to the education sector as well. The numerous challenges associated to the integration of ICT in the administration of educational institutions cannot be overemphasized. In affirmation, Camacho, Ramirez-Correa, Salazar-Concha & Baquero (2024) revealed that the integrating ICTs in higher education faces challenges and obstacles, such as faculty members lacking ICT skills. Some of the demerits ascribed to ICT in educational administration and management are as outlined below: -

1. **Unstable Power Supply:** Provision of power is one of the problems facing most higher educational institutions, particularly in Nigeria. This statement has been affirmed by Kupoluyi & Awotunde (2018), and Ogunode & Ndayebom (2023). The scholars emphasized that the epileptic power supply in higher educational institutions creates administrative inefficiency. Additionally, the issue of ICT equipment and hardware not being fully utilized was raised as a result of an unstable power supply.

2. **Isolation:** Scholars agree that the students constant use of digital tools is the beginning of their physical face-to-face isolation from both the teachers and their peers. The students are usually disconnected as they stay at the comfort of their bedrooms for their independent or individualized learning or studies.

3. **Academic Cheating:** Plagiarism has increased as students find pre-written work online leading to students gaining unfair result on coursework (https://getrevising.co.uk/grids/ ict_in_ education). The use of ICT encourages academic dishonesty as it is easy to copy and plagiarize other peoples' works online without permission. These are now made possible with the presence of some educational software like ChatGPT, Quillbot, Google, etc., that give immediate information or answers to questions at the finger-tips.

4. **Low ICT Literacy:** ICT creates a very big divide between students that can use it effectively and those who are novices to the use of ICT tools. So, low computer-literacy or lack of technical skills create a very big administrative and learning bottlenecks for both staff and students of higher education institutions (Kupoluyi & Awotunde, 2018). Hence, low ICT literacy refers to individuals who lack ICT

skills/knowledge, needed to manipulate most digital devices, software and online tools effectively to use, access, create, and evaluate information.

5. **Poor ICT Policies and Political Will:** Most Nigerian citizens are not technologically competent in making good policies for ICT use in most of the government owned organizations and parastatals, even when these policies are made, there is no political will to implementing them. Hence, the absence of ICT policies and poor political-will to implement such policies where such exists have been a hindrance to the efficient administrative breakthrough (Kupoluyi & Awotunde, 2018). For instance, to realize the international goals of digital education and national goals of digitalization of education in Nigeria, the Federal government developed different ICT and digital policies to enable the development of digital education in Nigeria. Nigerian government through the Nigeria Digital Economy Policy and Strategy (NDEPS) document set a corresponding target of achieving 95 percent digital literacy by the year 2030 (NITDA, 2021). According to NITDA (2021), the policy is to equip Nigerians with relevant digital literacy skills to keep up with the best global practices. But 2030 is already at hand, and there are no viable implementation strategies to put the current workers, youths and other professionals in ready mode for opportunities that may open up within and beyond the shores of Nigeria (NITDA, 2021).

6. **High Cost of Equipment:** High cost of digital facilities is yet another issue to be addressed. There is no doubt the acquisition of ICT equipment and most educational software are usually very expensive (Kupoluyi & Awotunde, 2018); with the current poor budgetary allocation to higher educational institutions, especially in Nigeria, the purchase or the acquisition of these educational equipment and software become a mirage, and most of the equipment are foreign oriented, as insignificant few are produced in developing countries for which Nigeria is the worst affected.

7. **Unreliability of Hardware & Lack of Trained Personnel:** Sometimes, the available hardware can be very unreliable and breaks down at will, and needs maintenance. Due to lack of trained personnel to maintain such equipment correctly may cause frustrations for both staff and students respectively.

8. **Digital Distractions:** The use of ICT poses lots of distractions to student learning. ChatGPT (2024) defines digital distractions as the phenomenon were individuals lose focus on their primary tasks due to interruptions or diversions caused by digital technologies, such as smartphones, social media, emails, and other online platforms. The telephone calls, Facebook sound, WhatsApp and text messages are very common in our environment. The ability to avoid these unwanted distractions is the beginning of effective digital integration in Nigeria and elsewhere.

9. **Easy Access to Unreliable Resources:** There are lots of information on the Internet, which are uploaded by any person. Therefore, students who are not conversant with the evaluation of Internet materials may use irrelevant information for their study. In totality, children who depends entirely on the internet can lead to accessing unsuitable resources (co.uk/grids/ict_in_education).

10. **Technology Dependent:** The use of information and communication technology tools have made it common for students and teachers to become reliant on computers and other related technological devices, and not the manual practice of learning or doing things with hands. It is not surprising to note that

individuals or organizations wholly rely on technologies to perform most duties/tasks, and solve numerous daily problems. These tasks are not only limited to the field of education, but also in the health sector, business, entertainment, and communication sectors.

11. **Resistance to Change:** Ogunode and Ndayebom (2023) have identified resistance to change among lecturers as one of the major problems of digitalization of educational programmes. Some of the lecturers are aged to be innovative, and not ready to improve on their current status, believing that what works yesterday may not be different with what happens today. Most of the personnel in higher educational institutions are digital immigrants that believe on what they have been doing that works before now. They have not changed their mindset for the new technology acquisition; hence, hampering the administrative system (Abbas, et al, 2023). These lecturers are ever ready to kill any innovative ideas, especially when they are at the apogee of any academic and administrative positions.

12. **Lack of Interest and Motivation**: Lack of technology interest by lecturers, administrators, and students can disrupt any innovative process. In a research conducted by Camacho, et al (2024), the scholars revealed that despite 92% of staff that received training in ICTs, faculty are not motivated to integrate ICTs into their academic activities. This lack of motivation, as they emphasized, affects their commitment to acquiring ICT skills, which can be detrimental to developing technological components within their current subjects. In addition, Becta (2006) in Abbas and Ehsan, Khan, Shehzad, Mehmood & Shah (2023) opined that the negative attitude of these teachers remain one of the important problems to use new technologies in the field of education. At a broader level, Becta (2006) stated that the negative attitude of the teachers was the important problem to use new technologies in the field of education.

13. **Human Capital Development**: The educational institutions and the government find it difficult to employ ICT personnel in the administration of higher educational institutions. Thereby employing technologically incompetent staff for the administration of higher educational institutions. This made Abasilim and Edet (2015) to identify the issues of human factor and low ICT competence whereby most of the personnel in the institutions administration and management are not trained, which inhibits the utilization of ICT platforms to improve higher educational institutions administration.

14. **Poor Feedback Mechanism:** In view of the teachers' shortage of time and mammoth workload due to the number of students involved in online programmes, the students find it difficult to get timely feedback, which invariably slows down their studies (Abbas, Ehsan, Khan, Shehzad, Mehmood & Shah (2023).

15. **Inadequate Funding of Digital Education:** Ogunode & Ndayebom (2023), Akinyemi et al. (2022), Ogunode (2020), and Dada, Atobauka & Ogunode (2022), have revealed that under-funding of higher education in Nigeria has affected all sectors of education. Consequently, poor funding of digital education in Nigerian higher educational institutions has hampered the development of digitalization of most education programmes. The researchers further noted that inadequate financing and allocation for digital technology at university education have resulted in insufficient supply of digital facilities, equipment, and materials. In support of the above assertion, Okwuosa & Modibbo (2021) affirmed that since education spending is primarily reliant on the meagre federal government budgetary allocation, it is making all educational aims very vulnerable. The meager annual allocation for the administration and management

of higher educational institutions in Nigeria is affecting the provision of infrastructural facilities/tools. Most higher educational administrators and managers find it extremely difficult to acquire enough or adequate computers/laptops for administrative officers and departmental heads to perform their duties with ease.

16. **High Maintenance Cost:** In the same manner we discuss the high cost of digital facilities, we at the same time discuss the high cost of maintenance of digital equipment in the institutions of higher learning. Most of the personnel maintaining technological equipment in Nigeria's higher educational institutions are expatriates. Hence, the cost of hiring and bringing them to the country cost a lot.

17. **Shortage of Digital Personnel:** There is no doubt that most lecturers and students in Nigerian's higher institutions are not digitally skilled and equipped for online learning. The above avowal has been avowed by Camacho, Ramirez-Correa, Salazar-Concha & Baquero (2024). In their study, the scholars stated that the faculty's inadequate expertise in ICT encumbered the integration of technology instruments across different topics. Again, in the same study, it was revealed that 75% of faculty members do not naturally use technology in their teaching processes and are unacquainted with virtual classroom facilities.

18. **Poor Internet Connectivity:** Poor internet coverage has been one of the obstacles for online learning in Nigeria. Internet service is very important for the realization of digitalization programmes in Nigeria and any other parts of the globe (Ogunnode & Ndayebom, 2023). According to these scholars, it has been proven that the availability and stable internet services make digital education efficient/effective in educational institutions. The scholars, however, are angered that internet coverage and accessibility in Nigeria are still at a neophyte stage. Reporting the magnitude of the poor internet connectivity, the Guardian (2022) affirmed that only 12.1% of the Nigerian population in 2022 enjoys meaningful quality internet services or connectivity. Similarly, a study by Alliance for Affordable, as reported by Ogunode and Ndayebom (2023) revealed that only 6.6% of the rural population and 16.4% of the urban have good Internet service. The above research findings by these scholars can attest to the state of internet connectivity in Nigeria as it affects online learning in both urban and rural environments.

19. **Technology Reliant:** One of the disadvantages of integrating ICT in administration of higher educational institutions in Nigeria and beyond is over dependent on technology, which means that the more we become dependent on ICT tools, the more it will hinder our capabilities to work without technology.

20. **Insufficient knowledge:** Generally, Irene and Sprito (2020) in their analysis of utilization of ICT in the effective administration of secondary schools in Uganda identified that the teachers had a lack of knowledge in terms of how to use ICT applications. Again, the teachers also highlighted an issue related to the lack of computers for performing ICT related tasks. This situation is not limited to Uganda, but to other underdeveloped countries of the world.

21. **Insufficient Digital Equipment:** This is not a fairy tale as it concerns Nigerian's higher educational institutions. It is a fact that most of the higher educational institutions in Nigeria lack digital equipment and software, thereby making it extremely difficult for effective administrative tasks in higher educational institutions.

22. **Inadequate Funding:** The issue of underfunding of Nigerian educational intuitions over years has always been on the news, because this has been one of the major causes of strikes in Nigeria.

23. **High Cost of Digital Equipment:** There is no doubt that most of these digital equipment and software in Nigerian higher educational institutions are imported and invariably very costly (Ogunode and Ndayebom, 2023). The current foreign exchange of US Doller to Nigerian naira, which is approximately ₦1,587 attests for the claim (ChatGPT, 2024).

24. **Techers' Poor ICT Literacy:** Staff development in most of Nigerian higher educational institutions are near zero. This is because no lecturer would like to use the meagre salary paid to him for self-development when the salary is not enough to feed the family.

25. **Students' Poor ICT Literacy:** It will be pertinent to ask how many secondary schools in Nigeria are equipped with computers. Majority of the secondary schools and higher educational institutions in Nigeria are not equipped with computers and other digital facilities. If the students had no background knowledge of ICTs in the secondary schools they graduated, where will they have it when the institutions they are graduating into are the worst. It is only in Nigerian higher educational institutions that computer as a course is taught without the presence of a computer. In this scenario, what do we expect to be the end product of a student who graduated from a Nigerian? Well, your guise is as good as mine.

26. **Poor Internet Connectivity**: Low level of Internet connectivity is preventing the effective use of ICTs in the administration of higher educational institutions in Nigeria. Most staff and students leave in remotest areas of Nigeria, where there is no trace of electricity and talk less of Internet connectivity.

27. **High Cost of Cyber Café Facilities:** This is related to the high cost of digital equipment discussed earlier. The cost of establishing a cyber café in Nigeria is very high, since most of the equipment and software are imported, especially in view of the current foreign exchange of Doller to Naira.

28. **Lack of Appropriate Policy:** There is lack of policy implementation in Nigeria. Nigerians are known for making good policies, but lack of top-level financial commitment for the progress in ICT integration, which is hampering the effective use of ICTs in Nigerian higher educational institutions. There is no systematic method implementation of laudable policies towards ICTs use.

29. **Cost of bandwidth:** Cost of bandwidth can significantly jeopardized the use of ICTs in higher educational institutions digital programmes, especially in rural communities where Internet connectivity is lacking and expensive to acquire. Businesses and individuals cannot afford fast and reliable Internet connectivity where the bandwidth is very costly. In general, unaffordable bandwidth due to cost could hinder access to online platforms and other digital tools that are indispensable to digitalization.

30. **Hacking:** Many individuals would ask how hacking is a challenge to digitalization of teaching-learning process? The cost of securing any online information is usually very high. Hackers usually engage in stealing customers' data, financial theft and also expose customers' financial records. However, when any organization's data is hacked, it will not only force the organization to invest heavily on cybersecurity,

and the organization is bound to loss most of their customers as they are no longer protected online. Again, the customers will no longer trust the organization in doing any sort of business. It is factual that ay business that is not built on trust will never prosper.

31. **Staff Computer Illiteracy:** Inability of many Nigerian teachers to be computer-literate hinders digitalization of education at all levels of the education system.

32. **Online Testing:** Online testing, with its many benefits, also isn't without its drawbacks. Online testing is only good for multiple-choice tests, not for essay or short answer questions. There is no doubt that students can still take essay-based tests online, but it is a human teacher that is needed to evaluate them (Ogunode and Ndayebom, 2023).

Solutions to Ameliorate the Bottlenecks to Effective Utilization of ICTs in Administration in Educational Institutions

There is no doubt that the application of ICTs in the educational administration has lots of merits. However, whatever has merits must have some demerits as well. For effective use of ICTs in administration of higher educational institutions, scholars have provided suggestions or solutions to some major challenges on how to tackle the problems hindering its effective use. Ojedokun and Owolabi (2003) believe that in surmounting these challenges, lecturers/teachers in the developing world would have to change their teaching styles and acquire relevant skills and technologies to transform the various classrooms; hence, the need for instructors to learn new skills to teach students on how to search for and use information to access up-to-date research reports and gain global knowledge.

Irene and Sprito (2020) analyzed the utilization of ICT in the effective administration of secondary schools in Uganda. The scholars collected data from 196 teachers and identified that the teachers had a lack of knowledge in terms of how to use ICT applications. Moreover, the teachers highlighted an issue related to the lack of computers for performing ICT applications. Another problem was raised as a result of an unstable power supply, leading to ICT equipment and hardware not being fully utilized. Based on these findings, the major problem with the effective use of ICT in the administration of secondary schools in Uganda involves technical issues. In addition, these researchers highlighted another issue related to lack of ICT knowledge and skills that contributed to the underutilization of ICT. To solve the power supply-related problem, these researchers recommended that the schools should shift to solar energy for effectiveness of their services. In the issue of lack of knowledge, the stakeholders in higher education matters should provide in-serve programmes for lecturers in the education system. Again, seminars, workshops, conferences should be provided for both the lecturers and the administrative personnel in institutions of higher learning in Nigeria for effective ICTs use.

Based on these findings of Irene & Sprito (2020), it was concluded that the major problems with the effective use of ICT in the administration of secondary schools in Uganda belonged to technical issues. This issue relates to lack of ICT knowledge and skills that contributed to the underutilization of ICTs in administration of higher educational institutions. To solve the power supply-related problem, these researchers recommended that institutions should shift from ordinary generator to solar energy.

Again, there should be partnership between government, public, private, and non-governmental organizations, such as companies and wealthy individuals to assist to invest in procurement of technical equipment and software to improve Internet connectivity. To further achieve this, the institutions budgetary allocations should be beefed up by government and stakeholders in education industry to enable institutions purchase the necessary ICT equipment for effective utilization in institutions' administration. In the same manner, they should consult experts in the field to tackle technical issues. It is also worthwhile to involve the services of experts, that is, Information Technology experts that will appropriately guide or supervise the gradual and systematic use of ICTs tools in education and for administrative purposes. This will be much achieved when most of the lecturers and administration personnel are trained to handle technical issues.

For administrative personnel and lecturers who are persistently resistance to change in the system, government and the institutions' policy-makers or stakeholders should organize orientations and other awareness programmes to intimate them of the immense benefits derivable from the use of ICTs in both administrative and academic practices. Government and institutions should introduce incentives to lecturers and administrative personnel, such as study leave, seminars, conferences. These should be freely sponsored to ginger faculty members and administrative personnel to get interest in ICTs related issues.

Furthermore, it is believed that when individuals, in this case, the lecturers and administrative personnel are involved in any decision-making that concerns them, they would feel recognized and will feel free and open up to express or speak out their minds, and invariably become part of any innovative process in the system. Therefore, the lecturers and administrative personnel should be part of any policy making and implementations for them to function very well. It is also advisable for educational administrators to invest in open source or low-cost educational management software that provides most features that support ICTs use in higher educational institutions.

Additionally, cybersecurity should be prioritized by organizations/institutions to protect or secure sensitive data, which left unprotected would hamper the services. The issue of cheating, academic dishonesty, or plagiarism should only be solved when appropriate software is employed to checkmate this act and appropriate sanctions or punishments are meted to offenders, who especially use ChatGPT, Quillbot, etc., to academically cheat. Again, the issue of low ICT illiteracy could only be solved when the government realizes that ICT literacy should start from lower schools, that is, the primary and nursery schools by equipping them with computers and other ICT related facilities. Computers and other ICTs facilities cannot teach themselves, teachers who are technically trained to impact these skills to the students.

It has been affirmed that most lecturers and students in Nigerian's higher educational institutions are not computer literacy or digitally skilled and equipped for online learning. Inability of many Nigerian teachers' students to be computer-literate hinders digitalization of education at all levels of the education system. In response to this assertion therefore, Nigeria as a nation should promulgate a strong ICTs policy or policies and implement same so as to save the country from being technologically incompetent and join the rest of the global village in online learning.

In the same manner, on the issue of isolation of learners due to their reliance on social media, lecturers should constantly be in contact with their learners so that they will not feel physically isolated. The federal government

should develop different ICT policies to enable the development of digitalization of education in Nigeria. Such policies should be given to those who have both administrative and political wills to implementing the policies. Nigeria government should through the Nigeria Digital Economy Policy and Strategy (NDEPS) make digital policies that will make educational institutions to compulsorily make policies' that will make it compulsory to train all lecturers and equip schools at all levels with ICT facilities to achieve the goal of digitalization of all higher and lower educational institutions.

Just as Ogunode & Ndayebom (2023), Akinyemi et al. (2022), Ogunode (2020) and Dada, Atobauka & Ogunode (2022). (2022) revealed that under funding of higher educational institution in Nigeria has affected all sectors of education system. Therefore, if Nigeria is ready to promote digitalization of her education system, more budgetary allocations should be made to higher educational institutions to enable them procure digital tools/facilities for online programmes.

As again reported earlier by Ogunode and Ndayebom (2023), which revealed that only 6.6 per cent of the rural population in Nigeria and 16.4 per cent of the urban have good Internet service. The poor internet coverage has been of great concern to learners and teachers as this has brought lots obstacles for online learning by Nigerians. Therefore, online education could only be realized if Nigerian government provides adequate Internet services for her citizens to enable them freely access the Internet.

The cost of bandwidth is also one of the great concerns for Nigerian students and lecturers. This has significantly endangered the use of ICTs in higher educational institutions' digital programmes, especially in rural communities where Internet connectivity is lacking and expensive to acquire. Businesses and individuals cannot afford fast and reliable Internet connectivity where the bandwidth is very costly. Hence, Nigerian government should as a matter of urgency provide fund for adequate provision of bandwidth for higher educational institutions for meaningful digitalization programmes.

Hacking of data is yet another challenge to the realization of ICTs programmes in Nigeria. Therefore, Nigerian government and organizations involved in online programmes should invest heavily on cybersecurity to prevent loss of data, which may be very detrimental to any organization. Again, Nigeria is not known for maintenance culture, especially as the cost of these online or digital equipment and software are very costly. Added to the above is lack of technical experts to maintain these facilities, which requires foreign personnel.

Prospects of Integrating ICTs in Higher Educational in Nigeria

In the years to come, we hope that the electronic materials will ultimately replace the traditional library, and researchers and students need not go to the physical places to find and collect information they need (Bolaji & Ajape, 2022). In line with Kupoluyi & Awotunde (2018), when the identified challenges are tackled, then, the prospects of effective ICT implementation will be better as more and more higher educational institutions are gearing up to embrace the use of ICTs in their operations. Furthermore, with the growth of new technological advancements today, and the rate of its integration in solving educational administration challenges indicate that the role of ICT in the future will grow tremendously in the education system (Henderson, 2020).

Summary

The authors have discussed the numerous merits and pitfalls of ICTs application in higher educational institutions' administration in Nigeria and in global perspectives. The use of ICT in school administration have also been attested to facilitates a conducive environment for administrators, lecturers/instructors, students, and parents, whereby they could readily engage in effective communication and collaboration in almost all human activities. They have also provided evidences that with use of ICTs, institutions administrators, instructors, and students alike could have 24 hours' access to electronic resources and collaboration globally. Based on literatures reviewed, the authors have concisely addressed the issued that could hinder the use of ICTs in higher educational institutions in Nigeria. The scholar did not also omit making numerous suggestions or recommendations that could improve the use of ICTs in administration of higher educational institutions. Conclusively, the authors made us believe that the future use of ICTs in higher educational institutions would be better in near future despite all feasible challenges.

Conclusion

Human beings are much more familiar with smart technologies today than before because of its widely use in every human endeavour. Precisely, new technologies have become a driving force behind economic growth and a developmental tool. According to Henderson (2020), smart technologies, such as smartphones, tablets, gadgets, smart televisions, etc., have made human life smarter, easier, accessible, and consequently made information much more available at the right time, right place in the right form to the right user. Globally, there are lots of derivable benefits when information and communication technologies are integrated in administration and management of higher educational institutions. This paper examined both the positive and negative impacts of integrating technologies in the administration of higher educational institutions. Among the positives are the simplification of the learning process, increasing the intellectual potential of students, strengthening the degree of learning at all stages of the educational system, efficient utilization of existing resources and simplification of administration tasks. others are: reducing the paper work, replacing reducing manual record keeping to electronic records, which aids in easy retrieval of information of both students and staff within seconds. However, whatever has merits must have its drawbacks; among the pitfalls are, teachers and students' poor ICT literacy, reliant on electricity, intermittent technical problems, etc.

Recommendations

In as much as there are various benefits ascribed to ICT use in the administration of higher educational institutions globally and Nigerian in particular, there are also numerous problems inherent in its integration and operations in the system. For effective utilization of ICT tools in the administration of higher educational institutions, the government, stakeholders in education should make the development of ICTs a major priority in their institutions. In addition, educational institutions should partner with wealthy individuals, private companies and non-governmental organizations for assistance to acquire ICT equipment and software. They should also develop sustainable policies that will promote the use of ICTs for teaching, learning and research (Nguyen, 2023). The instructors need to be interested and change their mindsets to gain more knowledge on how to acquire new skills to teach students in the 21st century learning styles, and how they can retrieve vital information that are abound on the Internet to up-to-date themselves support research work.

There is need to acquire germane skills and technologies to transform both the administrative setup of educational institutions and the classrooms by organizing continuous training programmes for staff on the use of ICT applications; organize conferences, seminars, and workshops for teachers to update their knowledge on the current technological advances in the field of ICTs, and also to cope with the demands of the 21st century learners (Abbas, et al, 2023). These programmes will enable the Faculty staff to improve on their teaching skills in the field of information and communication technologies that will enhance the teaching techniques and provide opportunities to deliver courses, either fully online or in a blended format (Camacho, Ramirez-Correa, Salazar-Concha, & Baquero, 2024).

The government and higher educational institution administrators, policy-makers, and stakeholders in the education industry should also introduce a policy that could carefully address the issues of human factor and other challenges hindering the effective utilization of ICT platforms to improve administrative and academic functions. Also, more budgetary allocations should be made available, with special allocation to digital education development (Ogunode, & Ndayebom, 2023) for higher educational institutions to enable them purchase/provide the needed technological equipment or tools for administrative purposes, with specific allocation to digital education development in all higher educational institutions in the country. Camacho, et al (2024) suggested that managers and administrators need to tailor training methodologies to accommodate the distinct needs and demands of various academic disciplines. The scholars also recommended that academic institutions should implement comprehensive training programs designed to enhance teaching abilities in Information and Communication Technology.

Furthermore, government should introduce enlightenment programmes that would focus on the benefits of ICTs in administrative and management processes. Computer literacy should be promoted among lecturers to increase the quality of teachers and learning in higher educational institutions. Nguyen (2023) stressed that trainings, workshops, seminars should be organized for lecturers from time-to-time to enhance their skills on ICTs usage and keep them abreast of new innovations and developments. Better funding will enhance the provision of ICT facilities, hence, the government should fund higher educational institutions better to surmount the challenge of high costs of ICTs facilities. Government should provide training programmes for teachers for ICT knowledge or skills. Study leaves should also be provided for staff to equip them with computer, internet, and other technological skills. Internet centers or networking facilities should be well equipped and secured to prevent hacking and other forms of cybercrimes that can seriously impede communication within the higher educational institutions.

Additionally, government should enact appropriate policies to encourage more staff and higher educational institution of learning to use ICTs, and also compliment and rewarded lecturers' or instructors to encourage others that show no interest in the use of ICTs. According to Nguyen (2023), such rewards can be in form of provision of laptops, projectors, and other accessories by government agencies; however, before attempting the implementation of ICTs in higher educational institutions, government should make sure that there are proper policies on ground, good planning, and good training of lecturers and other personnel in higher educational institutions, as well as proper reforms in teaching and learning processes.

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