



Leveraging Digital Transformation for Enhancing Office Technology and Management Education in Nigerian Polytechnics

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Abstract

This paper explores the imperative of leveraging digital transformation to enhance Office Technology and Management (OTM) education in Nigerian polytechnics. In a rapidly changing global workplace, the integration of digital tools and technologies has become essential to prepare students for the contemporary workforce. The paper highlights the need for polytechnics to embrace digital transformation, equipping graduates with competencies and skills that extend beyond traditional office management practices to encompass proficiency in modern office technologies. This transformation is more than a response to external pressures; it is a pathway to unlock the potential of Nigerian graduates, making them competitive in the job market and contributors to workforce innovation, efficiency, and competitiveness. However, navigating the challenges and opportunities posed by digital transformation requires strategic investments in infrastructure, continuous professional development, and a strong commitment to promoting digital literacy and citizenship among students. Such initiatives are critical for polytechnics to remain globally relevant and competitive, furthering the growth and development of the Nigerian economy.

Keywords: Digital Transformation, Digital Infrastructure, Office Technology and Management, Nigerian Polytechnics, Workforce Competency.

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Introduction

Nigerian polytechnics have played a pivotal role in providing technical and vocational education, catering to the evolving needs of the nation's workforce (FRN, 2013). Nigerian polytechnics have a long-standing tradition of offering courses in office technology and management (OTM), training students in skills such as document management, office software proficiency, and administrative processes (Okewole, 2020). These skills were historically crucial in preparing graduates for roles in offices and administrative positions across various sectors in Nigeria. However, the contemporary workplace is undergoing a profound transformation, driven by rapid technological advancements (AUC/OECD, 2021). As such, the relevance of OTM education in Nigerian polytechnics is facing unprecedented challenges and opportunities (Okewole, 2020). Take, for instance, the shift towards remote work accelerated by the COVID-19 pandemic (AUC/OECD, 2021). This abrupt change in the work environment highlighted the need for professionals who are not only well-versed in traditional office management practices but also adept at using digital collaboration tools, cloud-based software, and data analysis tools to support virtual teams and work effectively from remote locations (Tapiwa *et al.*, 2022).

In today's digitally driven world, technology is not merely an adjunct to office management practices but an integral component. Across industries and sectors, the adoption of digital tools and automation has revolutionized the workplace, demanding a new set of skills from office professionals (Hitt *et al.*, 2020). Digital transformation, a term encompassing the integration of technology into educational processes, administration,

and support services (Pani and Pramanik, 2020), has emerged as a powerful force in addressing the challenges faced by educational institutions worldwide (Marks *et al.*, 2020). It encompasses the strategic integration of digital tools, online resources, and innovative pedagogical approaches into technical education curricula, ensuring that students are equipped with the skills and knowledge necessary to thrive in a digitally-driven workforce (Benavides *et al.*, 2020). This transformation not only enhances the quality of learning but also facilitates a seamless transition for graduates into technology-intensive industries, making them more adaptable, competitive, and capable of contributing to the ever-evolving demands of the global job market. Furthermore, digital transformation in higher technical education has the potential to promote inclusivity, providing students from diverse backgrounds with equal access to cutting-edge resources and expanding opportunities for learning beyond the traditional classroom setting (Okewole, 2020). It is a key enabler of preparing a future workforce that can harness technology to drive innovation and economic growth.

The purpose of this paper is to explore the intersection of these critical factors: the evolving landscape of OTM education in Nigerian polytechnics and the potential for digital transformation to address the associated challenges and harness the opportunities (Okewole, 2020). The paper looks into the current state of office technology education, identifying challenges such as inadequate access to technology resources and outdated curriculum models (Akpan and Naboth, 2019). These challenges can be found in various polytechnics where students may lack access to up-to-date software or hardware, hindering their ability to acquire essential digital skills.



Digital Transformation in Education

Digital transformation in education represents a fundamental shift in the way educational institutions operate, embracing technology to enhance teaching and learning (Pani and Pramanik, 2020). It encompasses several key components, starting with the adoption of digital tools and resources. These can include Learning Management Systems (LMS), e-books, online databases, and multimedia content (Lazar *et al.*, 2020). Additionally, digital transformation involves reimagining pedagogical approaches. For instance, the implementation of flipped classrooms, blended learning, and massive open online courses (MOOCs) allows for more dynamic and interactive learning experiences (Low *et al.*, 2021). Administrative processes also undergo significant changes with the automation of tasks like enrolment, grading, and resource management using online portals (Awa, 2020; Gigane *et al.*, 2018). Moreover, data-driven decision-making plays a crucial role in digital transformation, as educational institutions collect and analyse data to enhance the quality of education and streamline operations (Skinner, 2019).

The significance of digital transformation in education is felt on a global scale (Pani and Pramanik, 2020). Educational institutions worldwide recognise the potential of digital technologies to address the challenges of the 21st century (Marks *et al.*, 2020; Okewole, 2020). For example, universities in the United Kingdom have embraced digital transformation to offer flexible learning opportunities, enabling students to access course materials and interact with instructors and peers remotely (Korber, 2019; Okewole, 2020). In the United States, schools and colleges have utilised online assessment tools and data analytics to personalise learning experiences and track student progress (Kane, 2019). These global examples illustrate the importance of adapting to digital transformation (Pani and Pramanik, 2020), as it not only enhances educational quality and accessibility but also empowers institutions to remain competitive in a rapidly evolving education landscape.

Digital transformation is reshaping traditional educational methods in profound ways. It moves education beyond the confines of the physical classroom, allowing students to access learning materials and engage with instructors and peers from anywhere with an internet connection (Benavides *et al.*, 2020). This transformation promotes lifelong learning, as professionals can acquire new skills and knowledge online, even while working full-time. The adoption of AI-driven educational tools offers personalised learning experiences, tailoring content to individual students' needs and preferences (Chen *et al.*, 2020). Furthermore, digital transformation expands educational access, reaching underserved populations and those in remote areas (Pani and Pramanik, 2020). An example is the use of digital libraries in Africa, providing students and researchers with access to resources previously unavailable to them.

Digital transformation in education is a global phenomenon that encompasses the adoption of digital tools, changes in pedagogy, and the use of data to improve teaching and administrative processes. It holds immense significance for educational institutions, enhancing quality, accessibility, and competitiveness. Moreover, it is reshaping traditional educational methods by extending learning opportunities beyond physical classrooms, personalising education, and reaching previously underserved populations (Okewole, 2020). Digital transformation is not merely a trend but a fundamental shift in how education is delivered and experienced.

Digital Transformation in Nigerian Polytechnics

The adoption of digital technologies in Nigerian polytechnics has gained momentum in recent years. Several polytechnics have made strides in integrating digital tools into their educational

processes. This includes the implementation of LMS and e-learning platforms that provide students with access to course materials and facilitate online communication with instructors and peers (Lazar *et al.*, 2020). Moreover, polytechnics have recognised the need for robust internet connectivity, often partnering with local internet service providers to ensure consistent access for students and staff. While the progress has been encouraging, it remains uneven across institutions, with some facing challenges in infrastructure and resource limitations (Marks *et al.*, 2020; Okewole, 2020).

Successful digital transformation initiatives within Nigerian polytechnics offer insightful examples of how technology can enhance the educational experience (Oluchi and Pyiki, 2019). For instance, most of the polytechnics in Nigeria have effectively utilised digital technologies to improve administrative efficiency by automating admission and registration processes (Awa, 2020; Gigane *et al.*, 2018). Additionally, the polytechnics' e-library initiative has made digital resources accessible to students, significantly enhancing their research capabilities (Bizi, 2021). Similarly, some polytechnics have embraced digital transformation by offering online courses and digital marketing training programmes (Babalola *et al.*, 2019). These initiatives have not only broadened educational access but also equipped students with relevant skills for the modern workforce. Despite these success stories, challenges such as inconsistent power supply and limited access to up-to-date software persist in many polytechnics, impeding broader adoption (Marks *et al.*, 2020; Okewole, 2020).

The implementation of digital transformation is not without obstacles (Al Amoush and Sandhu, 2020). Barriers such as inadequate funding for technology infrastructure hinder the ability of many institutions to adopt the latest digital tools. Inconsistencies in power supply also pose significant challenges, making it difficult to maintain and operate digital systems effectively (Marks *et al.*, 2020; Okewole, 2020). Faculty and staff development in digital pedagogy and the integration of technology into the curriculum require ongoing investment and commitment (Akpan and Naboth, 2019; Kane, 2019). Further, resistance to change, both among educators and students, can slow the adoption of digital technologies. Some educators may be hesitant to embrace new teaching methods, while students might struggle with the shift to online learning if they lack digital literacy skills.

The adoption of digital technologies in Nigerian polytechnics is a dynamic and evolving process. While progress has been made, challenges in infrastructure, funding, and cultural change still need to be addressed to facilitate the comprehensive implementation of digital transformation initiatives. Nonetheless, successful case studies demonstrate the tangible benefits of digital transformation, from administrative efficiency gains to improved access and the acquisition of relevant digital skills among students. These challenges and success stories serve as important reference points for future efforts to harness digital transformation in Nigerian polytechnics.

Challenges in OTM Education

The current state of office technology education in Nigerian polytechnics exhibits both strengths and weaknesses. On one hand, programme curricula, such as that of OTM at National Diploma and Higher National Diploma levels, have been adjudged adequate enough in providing students with foundational knowledge and skills in areas like document management, office software, and administrative processes (Oyinloye and Asonibare, 2020). These programmes have traditionally played a crucial role in preparing students for careers in office management roles across various sectors. However, challenges persist. Many polytechnics lack up-to-date teaching resources and infrastructure, making it difficult to keep pace with the rapid



technological changes in the field (Ukata, 2019). Insufficient funding for technical equipment, limited access to modern software, and outdated curriculum models hinder the effectiveness of these programmes in delivering relevant skills (Akpan and Naboth, 2019; Mgbonyebi and Osamor, 2019).

The challenges faced in OTM education extend beyond resource constraints. There is a notable shortage of qualified faculty members who are proficient in both traditional office management practices and modern digital tools (Ile and Okafor, 2021). Faculty training and professional development are often overlooked, leading to a gap in the knowledge and skills necessary to effectively instruct students in a rapidly changing technological landscape (Kane, 2019). Additionally, the curriculum may lack alignment with the dynamic needs of the job market (Adamu *et al.*, 2021; Ukata and Silas-Dikibo, 2021). Students may graduate with theoretical knowledge but insufficient practical experience. Furthermore, the assessment and evaluation of students' digital skills are sometimes inadequate, leaving a disconnect between educational outcomes and industry expectations (Ile and Okafor, 2021).

The impact of these challenges on students and the workforce is significant. Graduates of OTM programmes who are not adequately prepared to use digital tools and technologies may struggle to secure employment or may be limited to low-skilled, outdated positions (Adamu *et al.*, 2021; Ukata and Silas-Dikibo, 2021). This disconnect between education and industry expectations can result in high levels of graduate unemployment and underemployment. For the broader workforce, the inadequately skilled graduates entering the job market can create inefficiencies within organizations, as employers must invest more resources in training new hires. It also affects the overall competitiveness of Nigerian businesses in the global marketplace, where digital competence is increasingly crucial (Akpan and Naboth, 2019). These challenges not only hinder individual career prospects but also impact the nation's economic development and global standing.

Despite these challenges, some polytechnics in Nigeria have taken proactive steps to address these issues. For example, the Federal Polytechnic Ilaro initiated partnerships with four cement companies including Dangote and Lafarge to develop technology programmes appropriate for the industry (Oyinloye and Asonibare, 2020). Such collaborations offer students practical, hands-on experience and a chance to develop proficiency in using technology. Additionally, some polytechnics have revamped their curricula to include up-to-date courses in data analytics, digital marketing, and cloud-based office applications, aligning education more closely with industry needs. These examples highlight the potential for overcoming challenges through strategic partnerships and curriculum innovation (Akpan and Naboth, 2019). However, such initiatives remain limited in scope and impact, and there is a need for more widespread adoption of these practices to address the broader challenges in OTM education.

Addressing the challenges in OTM education in Nigerian polytechnics requires a multi-pronged approach that combines adequate resources, faculty development (Kane, 2019), curriculum enhancement, and collaboration with industry partners. These challenges not only affect educational outcomes but have a broader impact on the employability and competitiveness of graduates and the nation's economic development (Adamu *et al.*, 2021; Ukata and Silas-Dikibo, 2021).

Leveraging Digital Transformation for OTM Education

The integration of digital tools and resources into the curriculum of OTM programmes is a foundational aspect of leveraging digital transformation (Akpan and Naboth, 2019). Polytechnics have initiated this transformation by updating their

course materials to include the latest office software, data management tools, and digital collaboration platforms. These institutions provide students with hands-on experience using industry-standard software and cloud-based applications. For example, students can practice document management in a digital workspace, collaborate on projects using cloud storage, and utilise data analysis tools for decision-making simulations. This integration equips students with practical skills that are immediately applicable in modern office environments.

An integral part of leveraging digital transformation for OTM education is promoting online learning and collaboration. Under the stimulus of the Covid lockdown, some institutions have expanded their offerings to include fully online courses, allowing students to access educational content remotely (Eze *et al.*, 2020). These online courses are complemented by virtual collaboration tools, enabling students to interact with instructors and peers in real time, even when physically distant. Through forums, discussion boards, and webinars, students can engage in discussions, receive immediate feedback, and collaborate on group projects. The flexibility of online learning accommodates diverse student needs, schedules, and locations, making education more accessible.

The effective use of digital technologies in education relies on the proficiency of educators and staff (Kane, 2019). Nigerian polytechnics are increasingly investing in training programmes to equip faculty and staff with the necessary skills to navigate the digital landscape (Kane, 2019). Several institutions have introduced professional development opportunities, enabling educators to master digital teaching methods, create engaging multimedia content, and facilitate online discussions effectively (Okewole, 2020). Moreover, staff members responsible for maintaining digital infrastructure are trained to ensure the stable operation of digital systems (Kane, 2019). This emphasis on training ensures that both educators and support staff can maximise the benefits of digital transformation in the learning environment.

An important facet of leveraging digital transformation is ensuring access and equity in technology adoption (Orser *et al.*, 2019). Several educational institutions in Africa have launched initiatives to bridge the digital divide (Adeleke, 2021). These initiatives provide students with access to digital devices, ensuring that financial constraints do not impede their participation in online courses and digital learning activities (Adeleke, 2021). Furthermore, these programmes are designed to support students with disabilities, making digital resources and content accessible to all. By promoting access and equity, educational institutions can ensure that digital transformation benefits all students, regardless of their socioeconomic background or physical capabilities.

Leveraging digital transformation for OTM education in Nigerian polytechnics involves several approaches. It includes integrating digital tools into the curriculum, promoting online learning and collaboration, training educators and staff in digital proficiency, and ensuring access and equity in technology adoption (Kane, 2019). These efforts enable institutions to equip students with the skills and knowledge needed to excel in the digital era, making education more accessible, flexible, and inclusive. As polytechnics continue to embrace these strategies, they contribute to a workforce that is well-prepared for the challenges and opportunities of the modern office environment (Okewole, 2020; Ukata, 2019).

Benefits and Outcomes

Leveraging digital transformation in OTM education yields numerous benefits, foremost among them being the enhanced quality of education. Polytechnics that integrate digital tools and resources into their curriculum provide students with a more dynamic and engaging learning experience (Akpan and Naboth,



2019). For instance, students who have access to a digital library with a vast collection of e-books and research materials, can conduct more comprehensive and up-to-date research. This improves the depth and relevance of the education they receive. Furthermore, digital tools like LMS offer features for automated grading and feedback, streamlining the assessment process and ensuring timely and consistent evaluation (Lazar *et al.*, 2020). The overall effect is a more contemporary, efficient, and effective approach to education in OTM.

A central objective of leveraging digital transformation in OTM education is to prepare graduates for the job market with the skills that employers demand (Frankiewicz and Chamorro-Premuzic, 2020). Polytechnics with focus on digital marketing training and online courses, provide students with practical knowledge directly relevant to modern office environments. Graduates equipped with these digital competencies are better positioned for employment. Employers often seek candidates who can navigate digital tools for document management, data analysis, and collaborative projects. As a result, students who undergo digital transformation education are more competitive in the job market, and their improved employability is a clear outcome of this approach (Adamu *et al.*, 2021; Ukata and Silas-Dikibo, 2021).

The impact of leveraging digital transformation in OTM education extends beyond individual graduates to the broader Nigerian workforce and the national economy. As polytechnics prepare students with digital skills, they contribute to a more technologically adept workforce, capable of meeting the demands of a rapidly evolving job market (Frankiewicz and Chamorro-Premuzic, 2020). By producing graduates with proficiency in digital tools and modern office practices, these institutions help businesses and organisations become more competitive in the digital age. The increased efficiency and effectiveness of digitally skilled employees can boost productivity and innovation, ultimately contributing to economic growth (Sousa and Rocha, 2019). In this way, digital transformation education in Nigerian polytechnics has far-reaching implications for the nation's economic development and global competitiveness.

Leveraging digital transformation in OTM education results in a series of significant benefits and outcomes. It improves the quality of education by making it more engaging and efficient. Graduates gain an edge in the job market, becoming more employable due to their digital skills. Moreover, the impact ripples through the Nigerian workforce and economy, fostering technological advancement, productivity, and competitiveness. These outcomes collectively highlight the importance of embracing digital transformation to enhance the education provided in Nigerian polytechnics and its impact on the broader society.

Challenges and Considerations

The integration of digital technologies in OTM education brings forth several challenges and considerations (Okewole, 2020; Ukata, 2019), with privacy and security concerns being of paramount importance (Merchan-Lima *et al.*, 2020). Educational institutions must navigate the collection and storage of personal data, including students' information, and ensure that it complies with data protection regulations. Cybersecurity threats, such as data breaches and hacking, pose significant risks (Merchan-Lima *et al.*, 2020). Polytechnics must invest in robust security measures to protect sensitive information and maintain the trust of students and staff. Balancing the benefits of digitisation with the need to safeguard privacy and security requires careful planning and resources.

Challenges related to infrastructure and resource limitations can hinder the effective implementation of digital transformation initiatives (Okewole, 2020; Ukata, 2019). Many polytech-

nic in Nigeria face issues such as inconsistent power supply, which impacts the reliability of digital systems. Additionally, limited access to modern software and hardware can hinder students' ability to acquire essential digital skills. To address these challenges, institutions must invest in reliable power sources and technology infrastructure. Partnership initiatives with technology companies for the provision of digital resources can serve as a model for overcoming these limitations. Overcoming infrastructure challenges is crucial to ensure that all students have access to the tools and resources required for a successful digital learning experience.

A notable challenge in leveraging digital transformation in education is the resistance to change among both educators and students. Some educators may be hesitant to embrace new teaching methods and digital tools, particularly if they are more accustomed to traditional approaches. Overcoming this resistance requires comprehensive training and professional development programmes, empowering educators with the knowledge and skills needed to effectively use digital technologies. Additionally, students might be resistant to the shift to online learning if they lack digital literacy skills or face connectivity challenges (Okewole, 2020; Ukata, 2019). Polytechnics must provide support for digital literacy, ensuring that all students can fully engage with digital transformation initiatives. Navigating resistance to change necessitates a strategic approach that emphasises the benefits and provides support for both educators and students.

Using digital transformation for OTM education in Nigerian polytechnics presents challenges and considerations that must be addressed. Privacy and security concerns (Merchan-Lima *et al.*, 2020), infrastructure limitations, and resistance to change among educators and students are pivotal issues that require careful planning and strategic solutions. While these challenges can be formidable, they are not insurmountable, and with the right approaches, polytechnics can navigate them successfully to reap the benefits of digital transformation in education.

Recommendations and Best Practices

One of the primary recommendations for enhancing digital transformation in OTM education is the substantial investment in infrastructure and digital resources (Lusigi, 2019). Polytechnics in Nigeria should allocate adequate funding to establish and maintain reliable power sources, as consistent electricity is essential for the operation of digital systems. Moreover, institutions should invest in modern hardware and software, ensuring that students have access to the latest digital tools and resources. To overcome infrastructure limitations, polytechnics can establish partnerships with local internet service providers to guarantee widespread, reliable internet access, promoting equitable digital participation.

Continuous professional development for educators and staff is crucial for the successful implementation of digital transformation initiatives (Kane, 2019). Polytechnics should establish comprehensive training programmes that empower educators with the skills and knowledge needed to effectively use digital technologies in teaching. Training should cover not only technical proficiency but also pedagogical approaches that harness the benefits of digital tools for improved learning outcomes. Staff members responsible for maintaining digital infrastructure should also receive training to ensure the smooth operation of digital systems. These programmes should be ongoing, keeping educators and staff up to date with the latest developments in digital education.

To address resistance to change and ensure students can fully engage with digital transformation initiatives, polytechnics should promote digital literacy and digital citizenship among their student populations (Oliveira *et al.*, 2021). These skills are essential for students to navigate the digital world effectively.



Polytechnics can integrate digital literacy programmes into their curriculum, offering courses that teach students how to use digital tools, access online resources, and critically evaluate digital content (Akpan and Naboth, 2019). Moreover, promoting digital citizenship helps students understand their rights and responsibilities in the digital world, including issues related to online etiquette, privacy, and responsible use of technology. These initiatives empower students to become confident and responsible digital learners.

Conclusion

The imperative of digital transformation in Nigerian polytechnics is evident in response to dynamic changes in the global workplace and the evolving nature of OTM, which necessitates integrating digital tools and technologies to prepare students for the contemporary workforce. This imperative extends beyond external pressures and serves as a pathway to unlock the potential of Nigerian graduates, enabling them to be competitive in the job market and contribute to workforce efficiency, innovation, and overall competitiveness, thus bolstering the growth and development of the Nigerian economy. To address the challenges and seize the opportunities presented by this transformation, Nigerian polytechnics need to invest strategically in infrastructure and digital resources, prioritise continuous professional development for educators and staff, and actively promote digital literacy and digital citizenship among students. This commitment should involve support and resources from educational sector stakeholders, including government bodies, as embracing digital transformation is a continuous dedication to providing high-quality and relevant education to Nigerian students.

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