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Digitalization and Administrative Service Delivery in Akwa Ibom State College of Education, Akwa Ibom State, Nigeria

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ABSTRACT

In line with global trends, most organizations (public or private) are all moving toward digitalization for effective and efficient service delivery. This paper examines the role of digitalization in enhancing administrative service delivery in Akwa Ibom State College of Education. Faced with challenges such as inefficiency, limited access, and transparency issues, the education sector in Nigeria stands to benefit substantially from digital transformation. This study explores the current state of digitalization, its impacts, challenges, and future prospects in Nigerian universities and colleges. The study is qualitative in nature, relying on secondary sources of information. Based on the Technology-Organization-Environment (TOE) as the theoretical framework, we analyze the influence of digital solutions on institutional operations, with findings indicating that digitalization can improve service quality, processing speed, and accountability. Nonetheless, the study reveals issues such as inadequate infrastructure, limited digital literacy, and resistance to change hinder progress. Accordingly, the study recommends increased investment in digital infrastructure, enhancing personnel training, as well as establishing supportive policies for sustained digital transformation.

Keywords: *Digitalization, administrative, service delivery, digital transformation, digital infrastructure*

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INTRODUCTION

Digitalization in education has become a global trend, with developed countries leading in the adoption of electronic and web-based administrative systems (Li & Sun, 2021). For Nigerian tertiary institutions, where administrative inefficiencies seem prevalent, the integration of digital systems is crucial for modernizing service delivery and meeting the expectations of students, staff, and other stakeholders in the education sector. The term digitalization portrays the change impact and consequences of information and communication technology in the areas of economic, political, cultural and social on the society and its systems (Ovuru 2022 cited in Ibanga et al., 2024). The impact of digitalization is widely seen in various administrative processes such as student admissions, records management, financial services, and communication, making it an essential component of administrative reform (Agwu, 2022). The readiness of a country to implement digitally enabled education services depends on important preconditions which include the country's digital foundations such as high-speed affordable connectivity, digital identification and digital payment systems for individuals, communities, and societies to benefit more broadly. These also include digital enablers at the national and sectoral levels such as digital infrastructure, interoperable data infrastructures, digital skills and change management capacity, and innovation ecosystem, backed by relevant policies and regulations. Together, these enable systemic digitalization of education service delivery at scale (Rajasekaran et al., 2024).

The readiness of education systems for digital transitions relies on the following essential pillars:

(i) strategic leadership and governance; (ii) data and technology infrastructure; (iii) digitally enabled education service delivery and analytics; (iv) an education workforce with the necessary capacity and culture; and (v) the existence of an EdTech market and business models. These pillars plays very important role in shaping a country's digital pathways and together provide a comprehensive framework for informed decision-making. The understanding of these readiness level helps inform a country's preparedness for successful digital transition in its education system (Rajasekaran & Casap, 2022). Various studies have shown that technology can improve educational outcomes if certain conditions are put in place, such as learning sciences and digital development principles. However, literature has not kept pace with educational practice of technology use for teaching and learning and for pedagogical and administrative management. Some of the reasons for the significant lag between research and praxis include incoherence between speed and scale of technological advancements with regulation and research, challenge of generating timely, contextually relevant, and cost-effective research, and insufficient demand from policymakers for robust evidence on cost and quality (Olsen, 2023)

With the fast-paced growth in the number and variety of EdTech solutions, tools, and platforms, it is challenging to identify quality. Aspects of quality include the application of the science of learning, the safety of these tools, the ease with which these tools can connect with existing systems, their compliance with regulations and policies, their cost and eligibility for funding, and their impact on users. Policymakers and institutional managers often have to make rapid decisions regarding digital procurement and have to choose between a multitudes of options. With no shared global standards of quality, their decisions may be influenced by advertising and business metrics rather than the potential learning impacts of the technology. This may lead to mislabeling digital products as educational can have serious negative ramifications for learning within the educational institutions (Rajasekaran et al. 2024).

Systemic assessment of a country's readiness for using digital solutions in education is crucial for effective change management and for guiding digital transformation efforts. Such readiness assessment enables policymakers to objectively consider different scenarios and international best practices as well as to identify and prioritize actions that can ensure that policies are relevant for today and remain resilient to future challenges. Moreover, there is a significant danger of continuing and worsening inequities, because of less mature foundational capabilities and digital enablers in lower-income and lower middle-income countries compared to the upper-middle income and high-income countries (Olsen, 2023). This study aims to evaluate the effects of digitalization on administrative services in one of Nigeria's tertiary institutions and explores the associated challenges and potential for future development.

The Technology-Organization-Environment (TOE) framework is a theoretical framework that was developed in the field of information systems to explain how the adoption and use of new technologies are influenced by various factors, including the characteristics of the technology itself, the organizational context in which it is used, and the external environment in which the organization operates. According to Zhu & Kraemer (2005), the TOE model posits that an organization's technological readiness, internal structure, and external environment determine the success of digital transformation initiatives. In Nigeria, the TOE framework helps analyze how digital readiness, administrative dynamics, and government support influence digital adoption in tertiary institutions. The framework has been widely used in research on technology adoption and implementation in organizations, and it has proven to be a valuable tool for understanding the complex interplay between technology, organization, and environment.

The TOE framework consists of three main components: technology, organization, and environment. Technology refers to the characteristics of the technology itself, including its functionality, complexity, compatibility with existing systems, and ease of use. Organization refers to the internal context in which the technology is used, including factors such as the organization's size, structure, culture, and resources. Environment refers to the external context in which the organization operates, including factors such as market conditions, regulatory requirements, and social and cultural norms. One of the strengths of the TOE framework is that it provides a holistic perspective on technology adoption and implementation. Rather than focusing solely on the technology itself or the organizational context, the framework recognizes that both internal and external factors are important in shaping technology adoption and use. This allows researchers to take a more nuanced approach to studying technology adoption, and it helps organizations to better understand the complex interplay of factors that influence their technology decisions.

Another strength of the TOE framework is its flexibility. The framework can be applied to a wide range of technologies and organizational contexts, making it a useful tool for researchers and practitioners in a variety of fields. Additionally, the framework can be adapted to different research methods, including qualitative and quantitative approaches. However, there are also some limitations to the TOE framework. One limitation is that it may be overly broad and general, making it difficult to apply in specific contexts. Additionally, the framework may not fully capture the complexity of technology adoption and implementation, particularly in rapidly changing environments where external factors can have a significant impact on technology decisions. The Technology-Organization-Environment (TOE) framework is applied here to examine the factors influencing digital adoption. The growth of an e-commerce sector, emerging digital

technologies, such as big data, Artificial Intelligence, cloud computing and robotics, drive the implementation of new technologies in organisations (Verhoef et al., 2021). The advances in information communication technology (ICT) have dramatically changed the way organizations conduct business. Information and Communication Technology (ICT) is a term that combine information technology and communication technology (Ibok & Ibanga, 2016). The application of the technologies in the workplace has redefined inter- and intra-organizational communication and has streamlined business processes to ensure benefits, such as higher productivity, the wellbeing of employees and the satisfaction of consumers (Papagiannidis & Marikyan, 2020).

Literature review

Digitalization in the education sector

Digitization of the education system is the process of converting physical objects into a digital format. The process organizes data into bits that allow computers to process, store, and transmit information from one domain to the other with relative ease. In these processes, text extracted from physical paper is converted to other digital formats, which are subsequently stored on the computer for ease of future reference (Monton, 2022).

Digitization is often confused with digitalization. Digitalization has been more and more frequently in public discourse in recent years, with many variants of the term used and in many cases misused. It should be noted however, that, while digitalization is the act of converting analog processes to digital processes such as automating existing processes or retraining workers on using computers, digitization is yet to use digital technology to introduce systemic or organizational changes (Bloomberg, 2018). Thus, by digital transformation in the education sector, it means the redesigning of the education ecosystem, including its operational, organizational, and cultural aspects. As a complex, multicausal, and constantly evolving system, it requires integrating digital technology and data into daily life and effectively managing the resulting changes that it brings about (Rajasekaran et al., 2024).

Udegbunam et al. (2023) see digital transformation as a profound integration of digital technologies, processes, and strategies into all aspects of an organization's operations, leading to fundamental changes in how it delivers value to stakeholders. It involves the adoption of innovative digital tools, automation, data analytics, and reimagined processes to enhance efficiency, effectiveness, and user experience. Digital transformation is a profound and multifaceted evolution that entails the seamless infusion of digital technology across every facet of a business, resulting in a sweeping overhaul of operational methodologies and the very manner in which value is bestowed upon customers. Digital transformation requires that the organizational system be re-evaluated, re-engineered, and re-imagined so as to function effectively for strategic outcomes.

The transformation processes require digital transitions which are the advancements along a continuum with characteristic distinctions between analog, digitized, digitalized, and digitally transformed systems, with certain inflection points (Rajasekaran et al., 2024). In the process of transition, it would be appropriate for the initiators to consider the context, ambition or the needs, the rationale, the readiness and the outcomes in order to ascertain the kind of transition that should be pursued within a system. Globally, Tertiary institutions are leveraging digital tools for administrative functions to provide faster, more reliable, and student-centric services (Zhu & Li, 2021). For Nigeria, digitalization could significantly reduce paperwork, improve data accuracy, and enhance accountability in universities and colleges (Adedeji & Onuoha, 2021). In this way, digitalization can be viewed as the integration of digital technologies into processes, transforming traditional methods into streamlined, accessible, and efficient systems (Mugambi & Ndeto, 2020).

With the advent of AI, learning and work environments are going digital at an unprecedented speed and scale, but the demand for research evidence on technology use in education and skills development has just started to gain momentum. The availability, affordability, and use of digital innovations in education (across formal, informal, and non-formal systems) have increased rapidly in recent years. Worldwide investment in EdTech companies is on an upswing, with global investment growing from US$9.56 billion in 2017 to US$25 billion in 2022 (Adkins, 2020). Many more governments are advancing their digital investments in education. However, these are often expensive, require adequate capacity, and consume a large share of public education budgets. Consequently, the need for robust research evidence is being felt much more strongly.

Amidst these persistent and complex challenges, AI is revolutionizing education and skills development through its applications in computer vision, speech, machine learning, big data, and natural language processing. The rapid growth of AI in Education (AIEd) is reshaping interactions, communication, living, learning, and work. It has the potential to power personalized learning, support teachers' understanding, and revolutionize educational practices by applying technologies such as Intelligent Tutoring Systems (ITS), chatbots, and automated assessment to enhance learning, teaching, and administration. However, challenges persist, and its impact on education remains uncertain (Chiu et al., 2023). The pandemic and the global adoption of AI have further fueled longstanding debates, raising critical questions on issues of equity, ethics, and fairness. One of the primary objectives of Artificial Intelligence in education is to offer tailored learning guidance or assistance to students based on their learning progress, preference or personal traits

(Hwang, 2014; Hwang et al., 2022 cited in Ibanga et al., 2024).

Service delivery

The growth of any organization directly depends on the quality of service such organization delivers (Atairet, 2023 as cited in Atairet et al., 2024). Service delivery simply means the extent to which an individual, unit or department of an organization discharges their assigned or statutory responsibilities. It is also a means by which an organization evaluates an individual employee or unit input and output level especially in the area of attaining set goals or task assigned. In the view of Obi et al. (2020), service delivery is the degree to which an employee accomplished the tasks that made his or her job. Service delivery is the primary concern of any organization that deals with one or more persons (Atairet, 2022)

Service delivery is the fundamental reason for the existence of public service as its primary role is to provide services which the private sector may not have the capacity to offer or offer them at very high prices to the citizens (Egugbo, 2020). Public service delivery is sacrosanct as it is a representation of the basic structure of nation-building. It is a nexus as well as a bond between government and citizens and promotes the values of nations among the citizens (Shittu, 2020). To Shittu (2020), the desire to satisfy the public through the implementation of public policies, enforcement of laws, and realization of public welfare culminates in effective public service delivery.

Different groups in society will have different visions about what makes “good” service delivery. In the education sector for instance, clients (parents, learners, alumni, staff members) want low-cost, easy-to-access, safe, high- quality schooling that improves their children’s/their life chances. Policy makers and political leaders want to deliver social benefits at low cost, with high propaganda value and political rewards. The providers (lecturers/teachers/administrative and other staff) care about technically sound curricula, adequate incentives, high salaries, respect and safety. Thus, the effectiveness of service delivery depends on addressing competing goals and expectations in ways that satisfy the stakeholders (Okpa, 2019).

Service delivery is the capability and having the right infrastructure of delivering services correctly according to a particular standard and with consistency. It covers the help, assistance and services academic staff are required to give to students, parents, users of the university and the community. Service delivery can also be conceptualized as the relationship between policy makers, service providers and consumers of services, and encompasses both services and their supporting systems. In summary, service delivery can be viewed as the achievement of targets (performance/output/ productivity) of the tasks assigned to organizations or employees" within a particular period of time. It involves the execution of duties and responsibilities assigned by constituted authorities which one has promised to do, so as to achieve set goals of an organization. Therefore, the degree to which an organization or employees performs its duties and functions towards achieving set goals determines the spate of service delivery-whether it is efficient or inefficient, effective or ineffective, economical or not economical, productive or not productive.

Akwa Ibom State College of education and digital transformation

Akwa Ibom State College of Education (AKSCOE) is an institution of higher learning that was established as a science-based institution to train the much- needed middle-level manpower in science education**.** Established on the 10th day of January 1991 by the then military administrator of the State Wing Commander Idongesit Okon Nkanga, the school remains the first tertiary institution established by the Government of Akwa Ibom State. From the initial student population of 179 and 352 staff members, the school has existed for these past 33 years and has graduated over 30000 graduates. In the current academic session, the school can boast of student enrolment of 1200 and a staff strength of over 611. With increase in students and staff population, the volume of academic as well as administrative activities no doubt increase and this calls for implementation of digital administrative systems to enhance speed and efficiency in service delivery to both students and staff population (AKSCOE website). In view of the increase in students’ population and expansion in academic programmes of the college, the management of the college in collaboration with the state government have ensured digitalization of every school and department as presented in the (Table 1).

Benefits of digitalization for administrative services

The primary benefits of digital transformation in administrative services include increased efficiency, cost savings, transparency, and improved access.

Efficiency

Automation of repetitive tasks improves speed and accuracy, reducing administrative burdens. For instance, studies have shown that digital platforms allow faster and more transparent student admissions and financial transactions (Olusegun et al., 2022).

Cost savings

Digital systems eliminate paper-based processes, providing cost efficiencies that are reinvested in educational resources (Mugambi & Ndeto, 2020).

On the issue of using digital transformation to reduce cost of administration, Ofoma (2021) asserts that the implementation of ICTs in the government service allows for a significant reduction in information handling cost. E-Administration and its application has significantly led to reduction in the cost of handling information. Information is shared at a faster rate with a high level of accuracy and at a reduced cost (Atairet et al., 2024). This process enables faster sharing of information thereby reducing the frequency with which data is collected compared to when it is handled manually. Thus, the ICTs application in public service delivery reforms public administrative process by streamlining internal processes which enables faster, speedy and more informed decision making and transaction process

Transparency

Digital records ensure clear audit trails, promoting accountability. Furthermore, digital records enhance accountability, creating an auditable trail that can reduce corruption opportunities (Chukwu, 2023). Apart from reducing cost of administration, digital transformation in education ensures improved, fast and accurate service delivery. The digital transformation of education in recent times has brought about fast and accurate service delivery in such organizations as the NYSC, WAEC, JAMB and all other public service organizations. The digitalization process has helped to save time and reduce red-tapism in the conduct of government businesses. Furthermore, some schools of thought have emerged which assert that digitalization in education has created access to transparent, accountable and participatory governance which are evidenced in the freedom of citizens and other service recipients to contribute and exchange ideas and suggestions through electronic forums and websites. Consequently, digitalization provides and enhances networking of relationships among governments, customers, businesses, employees and other organizations (Ofoma, 2022). Chen et al. (2019) assert that network relationships are double-edged. In that, in a highly embedded network relationship, enterprises and manufacturers are closely linked to each other. Such a network structure can provide enterprises with multiple but repeated sources of information, ensure the correctness of information, let network members know one another through circular interaction, generate familiarity and trust, and prevent speculative behaviour. On the other hand, highly embedded network relationships will form a normative force, which will restrict the decision making and behavior of enterprises.

Enhanced accessibility

Digital platforms enable easy access to student information and services, improving student satisfaction (Li & Sun, 2021). It should be admitted that, while e-government initiatives in the public service gives rooms for public servants to interact, transact and communicate electronically with business, citizens and other stakeholders. It nonetheless boosts competitive and responsive service delivery. This means that the public sector is in a healthy competition with the private sector in delivering qualitative and productive services to the citizens. Digital transformation in education therefore, boosts competitive and responsive service delivery in the country. This development is heart-warming and commendable especially when one recalls that the private sector was on top in the use of ICTs in the country prior to the digitalization of operations and services in the public sector.

Challenges to digital transformation

Digitalization initiatives in many industries fail to reach their desired outcomes, in both the public and private sector. Reports from a variety of strategy consultants, such as BCG, McKinsey, and Bain, attest that only 15 to 25 percent of digital transformation initiatives end up meeting the planned business objectives. The many failed experiences of digital initiatives tend to share some common pitfalls observable across sectors and domains, several of which are also relevant in education. However, the transition is not without challenges. Limited digital infrastructure, low digital literacy levels, and inadequate funding hinder digital adoption in Nigeria's tertiary institutions. These issues are compounded by resistance to change from staff and administrators who are accustomed to traditional methods (Okafor & Eze, 2022).

Infrastructural deficits

Inadequate internet connectivity, inconsistent power supply, and lack of hardware limit digital system functionality. Research suggests that addressing these challenges will require both structural improvements and cultural shifts within institutions. Strategies often emphasize rolling out hard- ware or building infrastructure without including a clear pathway for how this will improve education delivery. Success is often quantified by inputs, such as the rollout of devices or the construction of computer labs, without acknowledging that these are only a means to achieve academic outcomes. Additionally, digitalization is often seen as a separate layer to be added onto an education component, as opposed to being built into it.

Digital literacy and training

Many staff and students lack the skills needed to utilize digital platforms effectively. Large-scale purchases of technology should not be made in the absence of an assessment and analysis of opportunity costs. Large-scale technology purchases are often made without either

testing the proof of concept of the technology in the intervention (especially considering the high failure rate of digital transformation initiatives) or budgeting for the TCO, such as device maintenance, training, change management, or curriculum reform, which can be five to ten times higher than the initial cost of acquisition. Inflexible, overly theoretical, long-term strategies often become outdated or limiting. High-level decision-makers or external consultants may take many months to develop theoretical policies in boardrooms without engaging with local-level stakeholders such as local government authorities, teachers, students, parents, and communities to ensure their buy-in. These fixed, long-term plans cannot adapt to the changing technology landscape due to their complexity and lack of contextual knowledge.

Funding constraints

Limited budgets restrict the ability of institutions to invest in the latest technology. Government officials often lack the capacity, resources, and time to fully support digital transition efforts. Government officials often do not have the capacity, resources, and time to develop the required skill sets for going digital, particularly when it involves the use of new tools and processes. These skills may include data management, data analysis, instructional design, and software-specific digital literacy skills. Governments may also lack access to appropriate software or approvals to use software or data storage mechanisms. Even when officials have the necessary skill sets and training, they are often overloaded when new digitalization activities are added on top of their existing roles and responsibilities. Overloading is an issue of capacity management and resource allocation. Disjointed legacy platforms and applications can be too expensive to fit into improved systems. While governments may acknowledge that systems can be improved, the cost, time, and approvals needed to update or merge them are high. For example, taking a building blocks approach to education data management makes sense in theory. However, when governments already have many stand-alone incompatible systems in place, the politics and costs of redesigning the underlying architecture can make it an unfeasible prospect (Adam, 2022).

Resistance to change

Institutional inertia and reluctance among staff members to adapt to digital tools inhibit progress. Lack of stakeholders' buy-in as sufficient time and effort are not put into understanding and responding to their needs and pain points. Without concluding a needs assessment with government authorities and with school managers and teachers, the proposed system might not meet their needs. They may have different expectations from digitalization initiatives than those of policymakers. This may lead to difficulties in implementation and outright resistance at the school level because of a lack of motivation among the teaching workforce. Similarly, different government agencies may have different interpretations of the country's digitalization strategy, resulting in a misalignment of efforts and poor investment decisions. These different approaches might be due to tensions between government agencies, power struggles, or political allegiances. Therefore, change management efforts might then be needed to overcome internal resistance.

Lack of monitoring

A lack of or poor-quality coordination, monitoring, evaluation, and accountability mechanisms can hamper the implementation of digitalization efforts. In some countries, non-state actors such as private sector companies or NGOs are already implementing digitalization projects, but their activities are not always monitored or integrated with national digitalization plans.

Data seams

The emergence of ICT comes with its concomitant negative perils to individuals, society and government in general due to the issue of data seams. Data privacy, data usability, and data security concerns may be too lenient or too restrictive. Governments may adopt data management processes that are either too strict or too lenient in terms of privacy and security. They may choose to restrict the hosting of education data to local data centers with the intention to maximize security. However, by doing so, they then limit the availability and usability of the data and increase the risk of entire platforms going offline if local data centers malfunction. Conversely, a government may choose to transition to public cloud hosting for greater flexibility, but without necessary safeguards, this opens the data up to risks of exfiltration or cyberattacks. Therefore, before aggregated data can be shared openly to support better decision-making, it is vital to take proper measures for data anonymization, cleaning, and security. But this process may be considered cumbersome and a bottleneck to making data open.

Digitalization and Service Delivery in Akwa Ibom State College of Education

Prior to the introduction of digital innovations in the college, there was abysmal service delivery characterized by ineffectiveness, corruption and excessive human interface. This aligns with Magbadelo (2020), who posits that, there is service failure in Nigeria public service which is an indication of bureaucratic delays in processing requisite approval.

From the Table 1 above, it can be noticed that, there is no directorate, school, department or unit that is without a functional computer. Furthermore, the school has over 250

Table 1: Degree of digitalization of directorate, schools and departments of the college of education.

Units/Depts./Schools/Directorate	No. of Depts.	Unit of computers	No. of projectors	Functional	Non-Functional
Provost office		4		4	
Deputy provost (Academic/Administration)		6		6	
Registrar office		4		4	
Bursars' office		5		5	
School of science	6	14		13	1
School of Arts/Social sciences	3	8		8	
School of vocational/Technical Education	4	10		10	
School of languages	3	8		8	
Early childhood care Education	2	6		46	
Education	4	10		10	
Administrative Directorate	5	25		25	
Directorate of continuing Education		3		3	
Directorate of Degree programmes		4		3	1
Directorate of summer/Remedial prog.		2		2	
Works Directorate		3		3	
Academic Planning Directorate		4		3	1
Research/planning Directorate		2		2	
Students' Affairs Division		2		2	
ICT Directorate		285		285	
Library		40	2	34	6
Directorate of Entrepreneurship		15		11	4
Centre for Educational Technology			4		
Health Centre		3		3	
Consultancy		2		2	
Internal/Quality Assurance Directorate		2		2	
Total		449	6	436	

Source: *Directorate of Works, COE AKS*

pieces of desktop computers in her JAMB CBT centre. Classes and conference rooms are mounted with projectors for ease of teaching, learning and presentation by students, teaching and non-academic staff alike. With this development, lecturers and non-academic staff are not left out in their quest to own a laptop or tablet so as to ensure effective utilization of these digital resources and justify government and management investment in them. This feat has made students' registration, compilation of students' results and processing of students' admission fast and easy. Thus, the introduction of digitalization in the college has resulted in effective and efficient administrative procedures, with a very minimal human interface that makes the presence of the citizens in public offices almost unnecessary (Ofoma, 2022).

Responses revealed that digitalization has significantly reduced administrative processing times and increased accuracy in records management. For example, student registration processes that previously took weeks are now completed within days through online portals (Agwu, 2022). Similarly, financial transparency has improved as digital transactions reduce the handling of cash, minimizing risks of financial mismanagement (Okafor & Eze, 2022). Digital transformation in Akwa Ibom State College presents an opportunity to revitalize administrative services, yet the lack of infrastructure and reluctance among stakeholders poses significant obstacles. The findings indicate that while digitalization brings efficiencies, addressing challenges such as funding constraints, digital literacy, and resistance to change is necessary for sustained adoption. Developing policies to foster public-private partnerships and digital training for administrative staff could facilitate this transition.

Due to the rapid evolution of technology, digitalization strategies must be flexible, adaptive, and iterative to remain relevant. Traditionally, the development of a strategy or policy precedes the implementation of a digital solution which can put the brakes on the rapid adoption of the solution. Since most challenges discussed earlier are human-centered implementation challenges rather than technology-centered issues, the guidelines outlined here are intended to address implementation challenges from the onset.

First and foremost, policymakers must begin with education sector problems, identify those solvable using digital technologies and set clear milestones and goals. It is not possible to implement all interventions envisioned in a strategy at once. Instead, the plan needs to focus on the specific, urgent challenges that the country is facing, which can be determined through a comprehensive analysis of the education sector. The goals that are set in the plan should balance comprehensiveness and feasibility, while recognizing that digitalization does not solve all problems and may not always be the best solution (Coftan et al., 2022). The goals of the plan should be aligned with broader education sector plans, existing and planned national ICT infrastructure, and digitalization plans in other sectors (Khalayleh, 2021). When policies related to ICT in education synchronize with other sector's plans, costs can be shared, and benefits can be optimized. For example, digital architecture can be shared between primary and higher education or between education and health

systems. Broader digitalization plans, such as providing connectivity, overlap strongly with connectivity availability in schools.

Installing undersea fiber optic cables or developing digital learning platforms in shared languages may require greater regional cooperation. In addition to aligning with other plans, ICT in education policies should align with what aspects of governance are centralized and decentralized and other political economy considerations. Context-specific factors, such as socioeconomic or emergency variations between regions, should be taken into account to ensure that policies can adapt to diverse needs.

It is useful to adopt agile delivery approaches where possible and when applicable to develop responsive policies and plans. These approaches start with a discovery phase where actors seek to understand a problem, and then iteratively implement alpha, beta, and trial phases to test, adapt, and improve as the policy is scaled up. In the alpha stage, multiple prototypes of different approaches and ideas might be tested to determine what works most effectively and appropriately within a given context. Using this methodology can prevent the development of theoretical plans that might not work in practice.

Digital transition policies must take into account different dimensions and layers of the education system as well as their governance arrangements to achieve policy coherence and alignment. To maintain adaptability and relevance, the policy ecosystem should incorporate feedback loop mechanisms to inform adjustments to the strategy in response to evolving trends and insights from stakeholders. This dynamic and integrated approach ensures that the digitally enabled education policy ecosystem remains responsive and effective in addressing the evolving needs of education systems (OECD, 2023)
Digital aspects should be considered and integrated into intervention design upfront, with inclusion, scale and sustainability for optimal impact. Scale cannot be an afterthought. Many interventions fail because the pilot projects are not scalable. Designing for scale means considering user costs, partners, funding models, and technology choices upfront. Crucially, a major difference between pilots and scaled projects is the amount of implementation and human support that is needed for the scale-up, which is often too costly.

Collaborations between different government stakeholders can facilitate a systems way of thinking, encourage trust and drive greater coherence and alignment. As highlighted in UNICEF's Pulse Check on Digital Learning, strategies that overlook the human element have higher failure rates. Systems become more effective when they focus on learning instead of on technologies or devices. Learning applies not only to students and teachers but also to government officials at all levels and all other stakeholders in the education ecosystem. Adopting a systems approach involves understanding the dynamics and complexity of interacting variables in a system, including stakeholders, policies, global events, regulations, and cross-sectoral influences (Bapna et al., 2021).

It is vital that decision makers periodically update the strategy in response to technological changes. It is important for a flexible, adaptable and collaborative approach in designing and implementing the strategy. This goes beyond soliciting stakeholder input to co-creating environments where various stakeholders can continuously and actively participate in sense-making. To ensure that the strategy remains responsive and resilient, it will need to be updated periodically, which is not usually the case with other strategies and policies.

Decision-makers should focus on the usability of their country's national Education Management Information System (EMIS) rather than on producing data dashboards as an end in itself. It is crucial that decisions regarding what an EMIS should measure and how it should operate should be influenced by the country's education policies and priorities. Policymakers should be able to use data to evaluate what progress is being made towards the achievement of those priorities. Therefore, data architects must understand the relevant policies and implement the necessary functionality accordingly.

Providing guidance, standards, and formal regulations is crucial to ensuring the safe and effective use of digital technology in education systems. The growing cybersecurity risks, data protection concerns, and potential algorithmic bias make it necessary for policymakers to pay closer attention to complying with existing digital security and data protection frameworks and to developing regulations in currently uncovered areas. Continuous regulatory efforts are essential to address privacy concerns and limit inequitable practices as educational technologies evolve. Lessons can be learned from other industries that use data to improve the user experiences while embracing transparent data use to improve results.

Conclusion

Digitalization is a promising approach to enhancing administrative service delivery in Nigeria's tertiary institutions. The findings reveal substantial benefits in terms of efficiency, cost savings, and transparency. However, realizing the full potential of digital transformation requires addressing infrastructural and cultural challenges. With supportive policies and sufficient investment, Nigeria's tertiary institutions can embrace digitalization, improving educational management and setting a benchmark for other sectors.

A new collective understanding of digitally enabled education systems is needed to achieve greater learning and well-being for all. Digital technologies are offering new tools through which learning goals can be achieved. However, this does not mean that achieving better

outcomes in a digital world depends only on the rapid adoption of new technologies in education systems. It crucially depends on decision-makers taking a value-based and purposeful approach to the discovery and design of digital solutions and innovations in education, diffuse the benefits of digital education technologies equitably and deploy them in an economically feasible way.

Today's education policymakers must choose contextually relevant digital pathways that help build a well-endowed and competitive labor force fit for dynamic and digitally intense labor markets. As every aspect of the digital economy is powered by people, education is both the key constraint and a key enabler of a successful digital transition. Hence, individuals need to be both avid producers and rapid consumers of the right skills, knowledge, and behaviors. At the same time, there is intrinsic value in education as part of the human endeavor to learn, grow, and participate in civil society as active and responsible citizens. Increasingly, civic participation is enabled through access to digital services, financial transactions, tax payments, voting, and many digital government services. In the end, the human side of the human-machine interface determines how technology can best serve education policymakers, administrators, service providers, teachers, and the community of students and parents.

Recommendations

The Akwa Ibom State government and the management of the institution should consider an urgent improvement on the digital infrastructure for effective and efficient service delivery. Also, management of the college should ensure adequate manpower training for members of staff in information and communication technology and finally, members of staff should be encouraged to change their perceptions from analog to digital in line with global best practices.

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