

DIGITAL APPLICATIONS FOR EFFECTIVE AND EFFICIENT EDUCATION MANAGEMENT IN PUBLIC SECONDARY SCHOOLS IN ENUGU STATE

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Abstract

Manually conducted school management is a primary problem in the administration of education today; therefore, the development of digitalized school management system will become a significant contribution to the science of school management. Many secondary schools in Enugu State face challenges related to administrative inefficiencies, including poor record-keeping, inadequate communication among stakeholders, and ineffective resource allocation. A digital application can streamline these processes, leading to improved management practices. A digital application can provide valuable data analytics that can inform decision-making processes, facilitate better management practices, improve teaching and learning experiences and foster greater involvement from parents and the community in the educational process. By integrating digital tools into educational management, schools can align their practices with modern curricular demands, ensuring that students are equipped with relevant skills for the future. Considering the important role that school management plays in a nation's human resources development, it is of interest to develop innovations that will make school management more effective and efficient. The study on the implementation of a digital application for effective and efficient educational management in secondary schools in Enugu State is justified by the pressing need for improved management practices, the potential for enhanced educational outcomes, and the alignment with technological advancements and policy initiatives. This paper therefore, will examine the key challenges in education management, analyse the role of digital applications in education management, explore the benefits of using digital applications, highlight the challenges of implementing digital applications, and provide strategies for their effective and efficient implementation.

Keywords: Digital application, Educational management, Digitalization, Development

Introduction

Digital applications refer to software programs designed to perform specific tasks on digital devices, such as computers, tablets, and smartphones. In the context of education management, these applications can streamline administrative processes, enhance communication, and improve the overall learning experience for students and educators. The integration of digital applications in public secondary schools can lead to more effective and efficient management of educational resources, data, and communication. Digitization in education management refers to the integration of digital technologies into the administrative and instructional processes of educational institutions. Akinyemi, Amaechi, and Etoh (2022) posited that digitalization of education is a concept adopted to ensure the innovative incorporation of modern technology and digital tools to assist the progress of teaching and learning, and to create more rooms for remote learning. Adapted to educational management, digital application for effective and efficient educational management is a concept adopted to ensure the innovative incorporation of modern technology and digital tools to assist the managing of educational institutions. In the context of secondary schools, this concept encompasses a wide range of applications, including the use of digital tools for data management, communication, curriculum delivery, and student assessment. The integration of digital technologies into education management has significant potential to transform educational management in public secondary schools. This transformation will come about through the adoption of digital tools and platforms that enhance administrative efficiency, improve communication, and facilitate data-driven decision-making. Understanding this digital landscape is crucial for educational leaders aiming to optimize school management and improve student outcomes.

Digital technologies have become integral to educational management, providing tools that streamline administrative processes. Digital applications can automate various administrative tasks, such as attendance tracking, grading, and scheduling. This automation reduces the workload on teachers and administrative staff, allowing them to focus more on teaching and student engagement (Baker, 2019). For instance, Learning Management Systems (LMS) such as Google Classroom and Moodle allow educators to manage course materials, track student progress, and facilitate communication between teachers and students (Almarzooq, Hoteit, and Matar, 2020). This transparency fosters a collaborative environment that supports student learning (Hwang & Chang, 2019). Digital applications can collect and analyze vast amounts of data related to student performance, attendance, and behavior. This data-driven approach allows educators to identify trends, assess the effectiveness of teaching strategies, and make informed decisions to improve educational outcomes (Siemens, 2013). Many digital applications offer personalized learning experiences tailored to individual student needs. Adaptive learning technologies can adjust the

difficulty of tasks based on student performance, ensuring that each learner progresses at their own pace (Kerr, 2018).

This personalization can lead to improved student engagement and achievement.

Digital applications provide access to a wealth of educational resources, including ebooks, online courses, and interactive learning tools. This accessibility can enhance the learning experience and provide students with diverse materials to support their education (Johnson, Adams, Cummins, Estrada, and Freeman, 2016). These platforms not only enhance the learning experience but also reduce the administrative burden on educators, allowing them to focus more on teaching. Moreover, data analytics plays a significant role in educational management. Schools can leverage data to monitor student performance, identify at-risk students, and tailor interventions accordingly (Baker & Inventado, 2014). By utilizing data analytics, educational leaders can make informed decisions that enhance educational outcomes and resource allocation. The shift towards digitization is driven by the need for more efficient management practices, improved educational outcomes, and enhanced accessibility to information. Education management in public secondary schools in Enugu State has been characterized by various challenges, including inadequate infrastructure, limited resources, and inefficient management practices (Nwankwo, 2020). The Nigerian government's commitment to improving educational quality has led to increased investment in digital technologies. However, the adoption of these technologies in educational management is still nascent.

The integration of digital applications in education management is vital for improving the overall effectiveness and efficiency of secondary education systems. In Enugu State, Nigeria, secondary schools face numerous challenges such as inadequate resources, poor infrastructure, and ineffective management practices. Digital solutions have emerged as powerful tools capable of addressing these issues. This paper will examine the key challenges in education management, analyse the role of digital applications in education management, explore the benefits of using digital applications, highlight the challenges of implementing digital applications, and provide strategies for their effective and efficient implementation in secondary schools.

Key Challenges in Education Management

Educational management is a system of professional, comprehensive, and sustainable school governance that provides various learning opportunities to students without discrimination (Óskarsdóttir, Donnelly, Turner-Cmuchal, and Florian, 2020; Siu, Xiao, and Wong, 2019). Facts on the ground show that management is a problem in the administration of education (Mohammadian, 2019; Tokel, 2019). Literature review reveals that most school management is ineffective and inefficient because it is conducted manually in all its aspects, i.e. curriculum,

student, educator and educational staff, facility and infrastructure, funding, management, leadership, evaluation, public relations, and cooperation (Shema, 2019). Moreover, school management is currently experiencing the challenge of globalization and Covid-19 pandemic. Globalization demands that school management produce human resources that are adaptable to the global changes of today (Aliyeva, 2020; Aloraifan, 2021), whereas Covid-19 pandemic has forced 1.6 billion schools to shut down while still required to continue the learning process to achieve the goals of schooling (United Nations, 2020). Key challenges in educational management can be categorized into three, namely, administrative inefficiencies, lack of data-driven decision making, and limited teacher training.

Administrative Inefficiencies: Traditional methods lead to inefficiencies in resource allocation, tracking student performance, and managing human resources (Obanewa, 2018). **Lack of Data-Driven Decision Making:** Many schools lack access to comprehensive data needed for informed decision-making, resulting in ineffective strategies (Nwankwo, 2020). **Limited Teacher Training:** Teachers often lack training in using digital tools, which hampers the effective integration of technology into the classroom (Ukeje & Ukeje, 2021).

Considering the important role that school management plays in a nation's human resources development, it is of interest to develop innovations that will make school management more effective and efficient. A number of researches suggest that digital innovations have helped schools in initiating an innovation in school management system that improves their quality and performance (Alkaabi, 2018; Ilomäki & Lakkala, 2019; Sahlberg, 2020; Shema, 2019).

Digital transformations facilitate the transmission of information through the use of big data. As a collection of a huge amount of heterogeneous information, big data have enabled schools to collect, manage, and preserve rich digital contents for a long period of time (Starkey & Eppel, 2019; Reinders & Mongkut, 2021), despite the difficulties that they still have in integrating the digital technology into their management (Widyanti, Santosa, and Utami, 2019; Godwin-Jones, 2021). To overcome this problem, schools have to innovate to change the manual management system into a digital, cloud, and cellular-based system to improve the operational efficiency and manage the institution effectively (Eloranta, Ardolino, and Saccani, 2020).

The Role of Digital Applications in Education Management

Digital applications can significantly enhance the management of educational institutions by promoting efficiency and effectiveness. Below are some critical areas where these applications can make an impact:

School Management Systems (SMS): School Management Systems (SMS) streamline administrative tasks such as student registration, attendance tracking, grading, and communication between teachers, students, and parents. Platforms like ‘Schoology’ and ‘Edmodo’ provide user-friendly interfaces that help manage daily operations and enhance parental involvement (Wahab, Adedoyin, and Adedokun, 2020). Example: In Enugu State, implementing an SMS can reduce paperwork, enable real-time tracking of student progress, and facilitate communication between stakeholders.

E-Learning Platforms: E-learning platforms, such as ‘Google Classroom’ and ‘Khan

Academy’, provide resources for both teachers and students, facilitating online learning. These platforms allow for personalized learning experiences and access to instructional materials, enabling students to learn at their own pace (Adeleke, 2021). Example: Public secondary schools can adopt these platforms to supplement classroom instruction and provide additional resources for exam preparation.

Data Management and Analytics Tools: Digital applications that focus on data management can aid schools in collecting and analyzing data related to student attendance, performance, enrollment trends, and resource allocation. Software like ‘Schoology’ or ‘Edmodo’ allows for real-time data access and analysis, supporting informed decisionmaking (Ibukun, 2020). Tools like ‘Microsoft Power BI’ allow schools to visualize data and generate insights that inform decision-making (Ogunyemi et al., 2021). Example: By using these tools, school administrators in Enugu can identify trends in student performance and allocate resources more effectively.

Communication and Collaboration Tools: Digital tools such as ‘Slack’, ‘Zoom’, ‘Telegram’ and ‘WhatsApp’ facilitate communication among teachers, students, and parents, thus fostering a collaborative learning environment and a more connected educational community (Akanbi, Adebayo, and Olaniyan, 2020). These tools can help bridge the communication gap that often exists in secondary schools (Ibukun & Fagbemi, 2020) as well as provide an efficient means of disseminating important notifications and updates. Example: Schools can use these platforms for virtual meetings, workshops, and parent-teacher conferences, enhancing engagement and support.

Professional Development and Training: Online professional development programs enable teachers to upgrade their skills and learn to integrate technology into their teaching practices effectively. Programs hosted by organizations such as the “Nigerian Educational Research and Development Council (NERDC)” focus on providing teachers with the resources they need to thrive in digital environments (Eze & Obasi, 2018).

Benefits of Using Digital Applications

The implementation of digital applications in public secondary schools yields numerous benefits. The following among others are benefits of using digital applications for effective and efficient education management in secondary schools

Improved Efficiency: Digital applications streamline administrative processes, reducing the time and effort required for managing school operations. This efficiency enables educators to focus more on teaching and learning (Ogunode & Abeh, 2021).

Enhanced Data Accuracy: Automated data collection reduces human error and enhances the accuracy of information, allowing for more effective planning and resource allocation (Ibukun, 2020).

Informed decisions and tailor administrative strategies: Digital application allows for the efficient collection, storage, and analysis of data related to student performance, attendance, and resource allocation. This data-driven approach enables school administrators to make informed decisions and tailor educational strategies to meet the needs of students (Baker, 2019).

Empower Administrators, teachers and learners: Injecting digitalization in the secondary education system produces self-reliant administrators, teachers and students that can be useful to themselves. The society and development of the country is also enhanced through effective digitalization in the school system. Administrators through digitalization in the education world would be able to plan, organize, direct and control resources through the aid of digitalization. Digitalizing secondary education would help teachers find it easier for them in executing prescribed tasks and responsibilities required of them in the teaching and learning process. Digitalization equips students with more active learning process. People in group or individual irrespective of their age could take responsibility for what and how they learn, achieving their personal goals as self-directed lifelong learners.

Streamlined Administrative Processes: Administrative tasks such as enrolment, grading, and scheduling can be automated through digital systems, reducing the workload on staff and allowing them to focus on more strategic initiatives (Meyer, 2020).

Increased Engagement: By facilitating better communication and providing interactive learning environments, digital applications can enhance student and parent engagement in the educational process (Gonzalez & Paul, 2019).

Enhances creative and innovative teaching and learning: With digitalization in the secondary education system, administrators would be able to formulate and implement policies that would

drive the teaching and learning of curriculum content on a more creative and innovative style to fit-in in today's 21st century global knowledge society.

Generate a professional workforce and fulfilled citizens: Digitalization would enable a community, group and workforce for the knowledge society to have a high proportion of people capable in different professional fields of study. It will help in managing knowledge transfer and contribute to practitioner knowledge in all its forms. This will foster unity as stated by the National Policy on Education (NPE). Application of digitalization, to execute curriculum content in the Nigeria education sector will not only help to make the teaching and learning of the content brought by the instructors active but also to transform education system. Digitalization will also tap the benefits of a more effective method of teaching and learning offers. Kajetanowtez and Wierzejewski (2010) pinpointed that managing education in a digital world has no rival when it comes to generation of intrinsic motivation and initiation of organized active learning in education. They equally see it as an efficient means of promoting self-study and frequent testing in the form of formative evaluation which engender proper monitoring of educational progress and periodical achievement. It is interesting to note that the use of digital devices such as computer, projectors, email, webcams, etc. helps learners to become motivated, eager to learn and creative. It helps learners to create a situation or atmosphere in which curiosity is aroused, imaginations stimulated, interests generated, viewpoints enlarged and attitudes changed thereby attaining the basic objectives of education.

Challenges of Implementing Digital Applications

Despite the benefits, the digital landscape in educational management is not without challenges. One significant issue is the digital divide, which refers to the gap between those who have easy access to digital technology and those who do not. This divide can exacerbate existing inequalities in education, particularly in public secondary schools where resources may be limited (Warschauer, 2011). Educational leaders must address these disparities to ensure that all students have equal opportunities to benefit from digital tools. Additionally, the rapid pace of technological change can overwhelm educators and administrators. Continuous professional development is essential to equip staff with the necessary skills to effectively utilize digital tools (Ertmer & Ottenbreit-Leftwich, 2010). Schools must invest in training programs that not only introduce new technologies but also foster a culture of innovation and adaptability. Other fundamental challenges that must be addressed include the following:

Non-ICT Compliant Government Policies and Regulations: One of the major setbacks to the digitalization of Nigerian educational system is the failure of Government policies and regulations to favour digitalization. The National Policy of Education and other working policy documents do not prioritize the infusion of smart technologies in educational administration. Although Government has made serious efforts in the provision of information and communication

technologies in our educational system, there are little or no policy provisions on how the administration can be digitalized (Loredana, 2015).

Paucity of Fund: Adopting digitalization in the education system requires a huge amount of money. It is not a project that requires meager capital or funds. Building an automated school system requires facilities such as computers, servers, air conditioned facilitated office, etc.

Infrastructure Limitations: Many public secondary schools in Enugu State lack the necessary infrastructure, such as internet access and functional devices, to support digital applications (Oloyede, 2019).

Knowledge/Skill Gap amongst Practitioners: Due to the neglect of ICT-capacity building, most school administrators are not digitally inclined. Some of the educational administrators still lack basic computer skills like computer keyboarding skills, internet connectivity, emailing, spreadsheet skill. Technological skills gap makes it very difficult for educational administrators to adopt digital practices (David, 2013). This explains why the administrative system has remained analogue even when administrative offices are equipped with information and communication technologies.

Resistance to Change: Traditional mindsets and resistance from stakeholders can impede the adoption of digital solutions. Some school administrators, teaching and non-teaching staff do not adopt digitalization in the school system. They see their present status of digital incompetency as comfort zones thus are pressed to keep to the status quo. Researchers, teachers and school leaders often see technological experimentation as outside the scope of their job descriptions (David, 2013). It is crucial to create awareness about the benefits of digital applications (Ikekwe et al., 2019).

Poor Electricity Situation: The epileptic power situation in the Nigerian system is not new. The few available digital resources in most of our schools are not regularly used for administrative purposes due to power outage (Oke, Aghimien, Aigbavboa & Koloko, 2018).

Sustainable educational digitalization requires constant power supply (Sacks & Barak, 2010).

Thus, the current electricity situation in the country does not support digital educational administration.

Strategies for Successful Implementation

The implementation of digital applications in public secondary schools is a complex process that requires careful planning and consideration of various factors to ensure effective and efficient

education management. it also requires infrastructure and Professional Development as well as funding and security measures.

Planning:

Three critical components of this planning process are needs assessment, goal setting, and stakeholder involvement. Each of these elements plays a vital role in the successful integration of technology in educational settings.

Needs Assessment: A needs assessment is a systematic process for determining and addressing the gaps between current conditions and desired conditions or "wants." In the context of digital application implementation, a needs assessment helps identify the specific requirements of the school, the challenges faced by educators and students, and the resources available (Harris, 2019). By conducting a thorough needs assessment, schools can ensure that the digital tools selected align with their educational goals and address the unique needs of their student population. For instance, a study by Alshammari, Alshammari, and Alshammari, (2020) emphasizes the importance of conducting a needs assessment to identify the technological competencies of teachers and students. This assessment can inform the selection of appropriate digital applications that enhance teaching and learning processes. Without a clear understanding of the needs, schools risk investing in technologies that do not effectively support their educational objectives.

Goal Setting: Goal setting is another crucial aspect of planning for digital application implementation. Clear, measurable, and achievable goals provide direction and focus for the implementation process. According to Doran (1981), effective goals should be Specific, Measurable, Achievable, Relevant, and Time-bound (SMART). In the context of education management, setting SMART goals can help schools evaluate the effectiveness of the digital applications and make necessary adjustments. For example, if a school aims to improve student engagement through the use of a specific digital application, it should establish clear metrics for measuring engagement levels before and after implementation. This approach allows for data-driven decision-making and helps educators understand the impact of technology on student learning outcomes (Higgins, Xiao, and Katsipataki, 2019).

Stakeholder Involvement: Involving stakeholders in the planning process is essential for the successful implementation of digital applications in education. Stakeholders include teachers, administrators, students, parents, and community members, all of whom have valuable insights and perspectives that can inform the planning process (Baker, Inventado, and Kauffman, 2020). Engaging stakeholders fosters a sense of ownership and commitment to the implementation process, which can lead to greater acceptance and utilization of the digital tools. Research by Pappas (2021) highlights that stakeholder involvement can enhance the relevance and

effectiveness of digital applications by ensuring that the selected tools meet the needs of all users. For instance, teachers can provide feedback on the usability of a digital application, while students can share their experiences and preferences regarding technology use in the classroom. By incorporating diverse perspectives, schools can create a more inclusive and effective educational environment.

Infrastructure

Investment in Infrastructure: Governments and educational authorities should prioritize funding for technology infrastructure, including hardware, software, and maintenance.

Stakeholders must invest in improving internet access and providing necessary devices for schools. Partnerships with telecommunications companies could facilitate this effort (Oloyede, 2019).

Regular Upgrades: Establish a schedule for regular updates and maintenance of technology to ensure it remains functional and relevant

Community Wi-Fi Initiatives: Partner with local governments and organizations to establish community Wi-Fi hotspots, especially in underserved areas.

Subsidized Internet Plans: Work with internet service providers to create subsidized plans for low-income families to ensure students can access online resources from home.

Offline Resources: Develop offline educational resources and applications that can be used without internet access, ensuring continuity of learning.

Professional development

Comprehensive Training Programs: Administrators and Teachers need adequate training on how to effectively integrate technology into their teaching practices. Comprehensive training programs should be established to prepare educators for using digital applications effectively. Regular workshops and mentoring can enhance their skills and confidence (Ikeke et al., 2019). Implement ongoing professional development programs focused on digital literacy, technology integration, and effective use of educational applications.

Peer Mentorship: Establish mentorship programs where tech-savvy teachers can support their colleagues in adopting and using new technologies.

Incentives for Training Participation: Provide incentives for teachers to participate in training programs, such as stipends, certifications, or professional development credits. Curriculum

Development: Collaborate with educators to develop a cohesive curriculum that incorporates digital tools and resources effectively.

Evaluation of Digital Resources: Establish a process for evaluating and selecting highquality digital content that aligns with learning objectives

Funding

Ongoing costs for technology, internet access, and training can be a barrier to sustainability. Solutions that work in one school may not be easily scalable to others due to differing contexts and needs. Implement pilot programs to test new technologies and approaches in a few schools before scaling them up, allowing for adjustments based on feedback and outcomes. Advocate for sustainable funding models that support ongoing technology investments, such as grants, public-private partnerships, and community fundraising.

Data Security and Privacy - Security measures

In the digital age, the management of educational institutions has increasingly relied on technology to streamline processes, enhance learning experiences, and improve

administrative efficiency. However, this reliance on digital applications also raises significant concerns regarding data security and privacy, particularly when it comes to safeguarding sensitive information about students and staff in public secondary schools. The importance of implementing robust data security and privacy measures cannot be overstated, as they play a critical role in protecting personal information, maintaining trust, and ensuring compliance with legal and ethical standards. Schools must implement robust policies to protect sensitive information and comply with legal regulations (Duncan, 2021).

Conclusion

The adoption of digital applications for education management in public secondary schools in Enugu State can lead to significant improvements in efficiency, engagement, and overall educational quality. Digital applications have the potential to transform education management in public secondary schools by streamlining processes, enhancing communication, and providing personalized learning experiences. Addressing challenges and implementing effective strategies is crucial for successful digital integration. As educators and stakeholders embrace these technological advancements, they position their schools for a more effective and efficient future.

Recommendations

The following recommendations are put forth:

1. Schools should implement blended and remote management to allow administrators, teachers, students, and other stakeholders to function, learn and interact both online and offline on their own.
2. Government should invest more funds in education and increase access to ICT infrastructure by providing the necessary facilities for complete digitalisation of the management of secondary schools This will bridge the gap emanating from varied access
3. Government should collaborate with internet, digital, and telecommunications service providers to ensure that ICT infrastructure, such as internet broadbands and network devices, is available and in good working order to support the digitalisation of educational management and teaching and learning processes
4. Learning new technologies should be paramount in every principal's job description as this will help to change the entire school's perspective about the use of technology thereby making it a priority. In turn, teachers will need to learn how to use technology in classrooms without walls. Principals, wanting students to compete globally will no longer be able to ignore the importance of digital competencies. These principals, with a new vision, will be taking steps to change mind-sets, policies and practices
5. Technical Expertise: Schools need to hire or train staff with digital skills to manage and maintain systems.
6. Cybersecurity: Protecting sensitive student and staff data from cyber threats is crucial.
7. Digital Divide: Ensuring equitable access to technology for all students and staff.

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