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Developing an Effective Framework for Digital Teaching and Learning in Nigeria's Distance Learning Institutions

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Abstract: *This paper addresses the challenges and opportunities of implementing an effective digital teaching and learning framework in Nigeria's distance learning institutions. Key barriers such as inadequate infrastructure, digital illiteracy, limited access to devices, and the digital divide between urban and rural areas are discussed. The proposed framework offers practical solutions to these challenges, including enhancing internet connectivity, providing affordable data packages, and equipping educators with digital pedagogical skills. Additionally, the importance of policy development and regulatory frameworks to ensure quality standards, data privacy, and accreditation is emphasized. Inclusivity is a core component, with strategies to support underserved communities and students with disabilities. By adopting a comprehensive approach that addresses these issues, Nigeria can harness the potential of digital education to provide equitable access to quality learning and empower future generations. This framework aims to guide policymakers, educators, and stakeholders in creating a sustainable digital learning environment that benefits all learners, regardless of location or background.*

Keywords: *digital, teaching, learning, distance learning*

Introduction

In 2020, a UNESCO report revealed that approximately 1.6 billion learners globally were affected by school closures due to the COVID-19 pandemic, leading to an unprecedented reliance on digital teaching and learning (UNESCO, 2020). In Nigeria, however, less than 40% of students had access to online education during this period, a stark reminder of the digital divide that characterizes the country's educational landscape (UNICEF, 2020). This significant gap highlights the urgent need for a comprehensive and effective framework for digital teaching and learning, particularly in distance learning institutions.

Distance learning is not a new phenomenon; it has historically served as a crucial educational model for reaching underserved populations, providing opportunities for lifelong learning, and addressing the limitations of traditional educational systems. In Nigeria, where geographical and infrastructural constraints often hinder access to quality education, distance learning plays an even more critical role. Digital technologies have the potential to revolutionize this space by offering scalable, flexible, and innovative solutions to traditional educational challenges. However, the effective deployment of these technologies remains fraught with obstacles, including inadequate infrastructure, limited digital literacy, and inconsistent policy implementation.

The challenges faced by Nigeria's distance learning institutions are multifaceted. Infrastructure deficits, such as poor internet connectivity and unreliable electricity supply, limit the ability of institutions to deliver digital education effectively. According to the Nigerian Communications Commission (NCC), broadband penetration in Nigeria stood at only 40.14% as of December 2020, with rural areas experiencing even lower levels of connectivity (NCC, 2020). Moreover, the high cost of internet services and digital devices poses significant barriers to accessibility for students and educators alike. Another critical challenge is the lack of digital literacy among both educators and learners. Many educators are not adequately trained to use digital tools for teaching, resulting in suboptimal learning experiences. Similarly, students often struggle to adapt to online learning environments, particularly those who lack prior exposure to digital technologies. This digital skills gap exacerbates the existing inequalities in Nigeria's education system.

Policy inconsistencies further compound these challenges. While the Nigerian government has made efforts to promote e-learning through initiatives such as the National Policy on ICT in Education, the implementation of these policies has been uneven and often lacks the necessary resources and coordination. This has led to a fragmented approach to digital education, with institutions operating in silos rather than as part of a cohesive national strategy. Despite these challenges, the potential benefits of digital teaching and learning in Nigeria's distance learning institutions are immense. An effective framework can bridge the educational divide, enhance the quality of instruction, and ensure that no learner is left behind. Such a framework must address the infrastructural deficits, build digital literacy, adopt innovative pedagogical strategies, and establish

clear and consistent policies. By doing so, Nigeria can harness the transformative power of digital technologies to create an inclusive and sustainable education system.

This paper argues for the development of an effective framework for digital teaching and learning in Nigeria's distance learning institutions. It explores the key components of such a framework, including infrastructure development, capacity building, pedagogical innovations, and policy alignment. By providing actionable recommendations for stakeholders, this paper aims to contribute to the ongoing efforts to improve the quality and accessibility of education in Nigeria.

Concept Analysis

Digital Teaching and Learning

Digital teaching and learning refer to the use of digital tools and technologies to facilitate instructional delivery, learning, and assessment processes. These technologies include Learning Management Systems (LMS), video conferencing platforms, mobile learning apps, multimedia content, and other digital tools designed to enhance educational experiences. Digital teaching extends beyond the substitution of traditional methods; it reimagines pedagogy by leveraging the unique capabilities of digital technologies to foster a more engaging, inclusive, and interactive learning environment (Anderson, 2012). A virtual classroom, for example, enables real-time interaction and collaborative learning among geographically dispersed students. Such digital environments empower learners to access resources and participate in discussions at their convenience, breaking down the barriers of time and space that characterize traditional classroom settings. Furthermore, digital teaching supports personalized learning by allowing educators to tailor content to individual students' needs, thereby enhancing learning outcomes (Siemens, 2014).

The rise of digital teaching and learning has been catalyzed by advances in information and communication technologies (ICT). In recent years, tools such as Learning Management Systems (LMS) like Moodle and Blackboard have gained prominence in academic institutions worldwide. These platforms serve as hubs for course materials, assessments, and student-teacher interactions, offering a structured yet flexible approach to learning. For example, LMS platforms enable educators to track student progress through analytics tools, thereby identifying areas where additional support may be required (Garrison, 2011).

In Nigeria, the adoption of digital teaching and learning is particularly critical given the country's unique educational challenges. The traditional education system is often characterized by overcrowded classrooms, limited resources, and a shortage of qualified teachers. Digital technologies provide scalable solutions to these issues by facilitating remote access to high-quality educational content and reducing the dependency on physical infrastructure (Jegede, 2013).

However, the successful implementation of digital teaching and learning in Nigeria requires addressing several key challenges. First, infrastructural deficits, including unreliable internet connectivity and limited access to digital devices, remain significant barriers. According to a report by the Nigerian Communications Commission (NCC), broadband penetration in the country was only 10% in rural areas as of 2015, highlighting the stark digital divide between urban and rural regions (NCC, 2015). Second, the lack of digital literacy among educators and students further complicates the adoption of digital tools. Many educators are unfamiliar with digital pedagogies, while students often lack the skills needed to navigate online learning environments effectively (Adewale, 2014).

Moreover, cultural attitudes towards digital education in Nigeria also play a role in shaping its adoption. Traditional perceptions of education as a face-to-face interaction often lead to skepticism about the effectiveness of online learning. Overcoming these cultural barriers requires a concerted effort to raise awareness about the benefits of digital teaching and learning, as well as providing evidence of its efficacy through pilot programs and success stories (UNESCO, 2015).

Despite these challenges, the potential of digital teaching and learning to transform Nigeria's education system is undeniable. By integrating technology into distance learning, institutions can reach a broader audience, including underserved populations in remote areas. Digital teaching also supports lifelong learning by enabling individuals to access educational resources at any stage of their lives, thereby fostering a culture of continuous education and skill development.

The role of government and policy in promoting digital teaching and learning cannot be overstated. Initiatives such as the National Policy on Information and Communication Technology (ICT) in Education, introduced in 2010, demonstrate the Nigerian government's commitment to

leveraging technology for educational development. However, the implementation of such policies has been inconsistent, with limited funding and coordination undermining their effectiveness (Federal Ministry of Education, 2010). To address these issues, policymakers must prioritize the allocation of resources to digital education and establish clear guidelines for its integration into distance learning programs. Furthermore, international frameworks and best practices offer valuable insights for developing an effective approach to digital teaching and learning in Nigeria. For instance, the Community of Inquiry (CoI) framework emphasizes the importance of social, cognitive, and teaching presence in creating meaningful online learning experiences (Garrison et al., 2000). By adapting such frameworks to Nigeria's context, educators can design online courses that foster active engagement and critical thinking among learners.

Distance Learning

Distance learning, often used interchangeably with online learning or e-learning, is a mode of education where students and instructors are separated by physical distance. This model relies on technologies to bridge the gap, delivering course content and facilitating communication between students and educators. Distance learning is particularly relevant in Nigeria, where geographical and socio-economic factors often limit access to conventional classroom-based education. For instance, the National Open University of Nigeria (NOUN) serves as a prime example of distance education in practice, offering programs to thousands of students across the country (Jegede, 2013). The concept of distance learning is not new; it dates back to the 19th century when correspondence courses allowed students to study remotely by exchanging materials through the postal service. However, advances in technology have revolutionized distance education, enabling real-time communication and interactive learning experiences. Today, distance learning encompasses various formats, including online courses, blended learning models, and virtual classrooms, all of which leverage digital technologies to enhance accessibility and flexibility (Moore & Kearsley, 2012).

In the Nigerian context, distance learning addresses critical challenges such as limited access to tertiary education, high dropout rates, and disparities in educational opportunities. According to the National Universities Commission (NUC), only 30% of eligible candidates gain admission to Nigerian universities each year, leaving a significant portion of the population

without access to higher education (NUC, 2015). Distance learning institutions like NOUN provide an alternative pathway for these individuals, enabling them to pursue education while balancing other responsibilities, such as work and family commitments (Adewale, 2014). However, the effectiveness of distance learning in Nigeria is influenced by several factors. Infrastructure remains a significant barrier, with many students lacking access to reliable internet connectivity, electricity, and digital devices. A study by Afolabi (2013) found that 70% of distance learning students in Nigeria rely on mobile phones as their primary means of accessing course materials, highlighting the need for mobile-friendly learning platforms and resources.

Another challenge is the quality of instruction and learner support. While distance learning offers flexibility, it requires robust mechanisms for delivering high-quality content and providing academic support. Educators must be trained to design and deliver online courses effectively, incorporating multimedia elements, interactive assessments, and opportunities for collaboration. Additionally, institutions must establish support systems to address students' technical and academic needs, ensuring a positive learning experience (Jegede, 2013). Policy and governance also play a crucial role in shaping the landscape of distance learning in Nigeria. The NUC's guidelines for distance education emphasize the importance of accreditation, quality assurance, and institutional capacity building. However, the implementation of these guidelines varies widely across institutions, leading to disparities in the quality of distance education programs. To address these issues, the government must strengthen regulatory frameworks, invest in infrastructure, and promote public-private partnerships to support the growth of distance learning (Federal Ministry of Education, 2010).

Despite these challenges, distance learning has the potential to transform Nigeria's education system by expanding access, promoting lifelong learning, and addressing skill gaps in the workforce. By leveraging technology, distance learning can reach underserved populations, including individuals in rural areas, working professionals, and marginalized groups. Moreover, it aligns with global trends towards flexible and personalized learning, enabling students to acquire knowledge and skills at their own pace and convenience (Siemens, 2014). To maximize the impact of distance learning in Nigeria, stakeholders must adopt a holistic approach that addresses the interrelated challenges of infrastructure, pedagogy, and policy. This includes investing in broadband infrastructure, providing training for educators, and developing localized content that

reflects the cultural and linguistic diversity of Nigeria. Additionally, institutions must prioritize learner-centered approaches, incorporating feedback mechanisms, peer interactions, and adaptive learning technologies to enhance engagement and outcomes.

Framework for Effective Digital Teaching and Learning

A framework is a structured approach or system that provides a comprehensive outline for implementing a particular process. In the context of digital teaching and learning, a framework encompasses the essential components—such as infrastructure, pedagogy, policy, and capacity building—required for effective implementation. It serves as a roadmap for stakeholders to align their efforts with the overarching goals of digital education (Garrison, 2011). The interconnectedness of these concepts is central to understanding the challenges and opportunities of digital education in Nigeria. Digital teaching and learning are essential for modernizing the country's distance learning institutions, as they address limitations such as overcrowded classrooms and limited teacher availability. By leveraging a robust framework, institutions can ensure that digital initiatives are implemented cohesively and sustainably.

For example, digital teaching relies heavily on the availability of infrastructure, such as reliable internet and digital devices. Without these foundational elements, even the most innovative pedagogical strategies cannot succeed. Similarly, distance learning requires clear policies to standardize practices across institutions and ensure quality assurance. The alignment of these components within a framework enables a seamless transition from traditional to digital modes of education. Existing studies and frameworks illustrate the practical applications of these concepts in Nigeria's education system. The National Policy on Information and Communication Technology (ICT) in Education, introduced in 2010, highlights the government's commitment to integrating digital technologies into teaching and learning (Federal Ministry of Education, 2010). However, the policy's impact has been limited due to gaps in implementation and funding.

Another example is the Learning Management System (LMS) adopted by the University of Lagos (UNILAG) to facilitate online learning during the COVID-19 pandemic. While the initiative enabled continuity in education, it also exposed infrastructural deficiencies, such as poor internet access for students in remote areas. These challenges underscore the need for a

comprehensive framework that addresses both technological and human factors. International frameworks also provide valuable insights. The Community of Inquiry (CoI) framework, developed by Garrison et al. (2000), emphasizes the importance of social, cognitive, and teaching presence in online learning environments. Adapting such models to Nigeria's context can enhance the effectiveness of digital teaching and learning. The framework for effective digital teaching and learning in distance learning institutions in Nigeria should be grounded in practical and sustainable strategies, considering the country's unique challenges and resources.

1. **Needs Assessment and Stakeholder Engagement**: The first step involves conducting surveys and focus group discussions with students, faculty, and staff to understand their technological challenges, learning needs, and expectations. This helps identify the barriers, such as limited internet access and device availability, and guides the development of targeted solutions.
2. **Curriculum Adaptation and Content Design**: The curriculum should be designed for online delivery, breaking down courses into modular units to facilitate flexible learning. Course content must be adapted to digital formats such as videos, podcasts, e-books, and interactive quizzes, ensuring that it caters to diverse learning styles. This approach allows for a manageable and engaging experience for students.
3. **Digital Infrastructure Development**: Distance learning institutions should invest in robust Learning Management Systems (LMS) such as Moodle or Google Classroom. These systems must be accessible on a range of devices, including smartphones and basic laptops, to ensure inclusivity. Collaborations with telecommunication companies can facilitate discounted data packages for students and teachers, while efforts should be made to provide internet connectivity in underserved regions.
4. **Teacher Training and Professional Development**: Teachers must be equipped with the skills necessary for digital pedagogy, which includes training on online teaching tools, virtual classroom management, and digital content creation. Ongoing professional development will ensure that educators are up-to-date with emerging technologies and teaching methods. Peer mentoring programs can be implemented to promote knowledge sharing among instructors.

5. **Student Support Systems**: It is essential to establish virtual help desks for technical support, and provide online academic advising and counseling services. Additionally, digital literacy training must be offered to students who are unfamiliar with online learning environments. Online communities should be created to foster collaboration and peer support, enhancing the overall learning experience.
6. **Blended Learning Approach**: A balanced approach should be adopted, combining both synchronous (live sessions) and asynchronous (pre-recorded lectures, self-paced activities) learning methods. In-person sessions or workshops should be scheduled when feasible, particularly for hands-on learning. Course materials should also be available offline to accommodate students with unreliable internet access.
7. **Assessment and Feedback Mechanisms**: Effective assessment strategies must be integrated into the digital learning process. This includes regular formative assessments such as quizzes and assignments to track student progress. Peer reviews and group assignments should be encouraged to promote collaboration, and timely feedback must be provided through LMS platforms or email. Low-stakes assessments should be implemented to reduce pressure on students and foster engagement.
8. **Monitoring and Evaluation**: Continuous evaluation is crucial for the success of the framework. Regular feedback from students and faculty about the effectiveness of digital tools and methods should be gathered. Monitoring tools within LMS can track student engagement and performance, while data analytics can provide insights into areas needing improvement. Curriculum and teaching methods should be adjusted based on feedback and performance data.
9. **Policy and Governance**: Clear policies should be established regarding data privacy, intellectual property, and online conduct to ensure the integrity and security of digital learning environments. These policies must align with national education standards and guidelines. Advocacy for government support for digital education infrastructure, including subsidies for students in need, is essential for the success of the framework.
10. **Community and Stakeholder Engagement**: Building partnerships with local businesses, NGOs, and government agencies can help provide resources such as devices and internet access to students in need. Engaging parents and communities will ensure that digital learning is supported and embraced, particularly in rural areas. Awareness campaigns

should highlight the benefits of digital learning, encouraging greater participation and enrollment.

By addressing these strategic areas, distance learning institutions in Nigeria can create a more effective, inclusive, and sustainable digital education framework, improving access and quality of education across the country.

Key Considerations for Implementing the Framework

1. Infrastructure Development

Challenges Infrastructure remains one of the biggest barriers to effective digital education in Nigeria. Many distance learning institutions struggle with unreliable internet connectivity, limited access to digital devices, and power supply issues. The low internet penetration rate, particularly in rural areas, hinders the ability of students to participate in online learning effectively (Adegoke & Ijaiya, 2020). The existing infrastructure is often outdated and insufficient to meet the demands of modern e-learning environments. According to a 2020 report by the Nigerian Communications Commission (NCC), Nigeria has an internet penetration rate of 50%, which is still low considering the country's population (NCC, 2020). This creates a significant digital divide between urban and rural learners.

Proposed Solutions To address these challenges, the Nigerian government and private sector must collaborate to improve the country’s digital infrastructure. Partnerships between universities and telecommunication companies could be established to provide affordable data packages for students and educators. Furthermore, institutions should invest in Learning Management Systems (LMS) that are optimized for low-bandwidth environments. For instance, platforms such as Moodle and Google Classroom can be adapted to run on mobile phones and low-cost devices, which would help bridge the gap in access.

Power supply is also a critical issue for e-learning. Institutions should invest in backup power sources like solar panels, particularly in rural areas where power outages are frequent. For instance, the Nigerian Government's Rural Electrification Agency (REA) can partner with universities to

implement solar-powered internet infrastructure, ensuring reliable access for students in remote areas (Nigerian Government, 2022).

Supporting Evidence Studies have shown that similar investments in infrastructure have led to improvements in digital learning outcomes. A case study from Kenya's Strathmore University, which partnered with the government and private sector to provide affordable internet and digital devices, demonstrated an increase in student engagement and performance in e-learning (Kariuki, 2017). The experience of mobile-learning initiatives like M-Learning in South Africa also supports the idea that mobile-optimized LMS platforms can provide access to learning materials in low-connectivity settings (Mtebe & Raisamo, 2014).

2. Digital Literacy

Challenges Digital literacy is another significant barrier to digital learning in Nigeria. Many students and teachers lack the basic skills required to navigate online platforms, use digital learning tools effectively, and participate in virtual classrooms. According to Adebayo & Ojo (2018), only 30% of Nigerian students in tertiary institutions are digitally literate, and this gap in digital skills presents a barrier to both teaching and learning. In addition, some teachers are not adequately trained to use technology in pedagogy, leading to a lack of engagement in virtual classrooms.

Proposed Solutions To address the lack of digital literacy, both students and teachers should receive mandatory digital skills training as part of their educational journey. This can be integrated into the curriculum, ensuring that students are equipped with basic digital competencies before they engage in online learning. For example, universities could offer workshops, online courses, or certification programs in digital literacy, focusing on the use of e-learning platforms, basic troubleshooting, and cybersecurity. Teacher training programs should also include professional development opportunities focused on digital pedagogy. Instructors should be trained not only to use technology but also to adapt their teaching methods for the digital environment. This includes training on creating engaging digital content, managing virtual classrooms, and employing interactive tools that promote active learning (Ojo & Ojo, 2019).

Supporting Evidence Research from the European Commission has shown that digital literacy training for teachers and students leads to improved learning outcomes and better engagement with

e-learning platforms (European Commission, 2016). In Kenya, the Digital Literacy Programme implemented by the government and Ministry of Education trained thousands of teachers and students in ICT skills, resulting in a higher level of digital engagement in schools (Mwirigi, 2017).

3. Pedagogical Strategies

Challenges A major challenge for digital education in Nigeria is the lack of pedagogical strategies that are suitable for online learning environments. Traditional face-to-face teaching methods do not always translate well to virtual settings, which can lead to disengagement and poor learning outcomes. Many Nigerian educators are still adapting to the unique demands of digital pedagogy, which requires skills such as designing interactive content, facilitating online discussions, and conducting assessments that are fair and meaningful in a virtual setting (Alabi & Yusuf, 2021).

Proposed Solutions Institutions should focus on adapting the curriculum to fit digital learning environments by adopting a learner-centered approach. Blended learning, which combines both online and face-to-face methods, can help ensure that students remain engaged and motivated. Moreover, educators should use various interactive tools, such as discussion forums, collaborative platforms (e.g., Google Docs, Padlet), and virtual simulations, to promote active learning and peer interaction. The use of video content should be integrated into teaching practices, where feasible. Videos offer visual stimulation and can be more engaging than traditional reading materials. Virtual labs or simulations should be used for courses requiring practical hands-on experience, such as in the sciences or engineering.

Supporting Evidence Research by Garrison and Kanuka (2016) highlights that active learning methods, including online discussions and collaborative projects, increase student participation and engagement in e-learning settings. A case study from the University of Lagos shows that blended learning strategies led to improved academic performance among students in distance learning programs (Ogunyemi et al., 2020).

4. Policy and Regulation

Challenges The lack of comprehensive national policies on digital education is a significant challenge for distance learning institutions in Nigeria. Many institutions operate in a regulatory

vacuum, leading to inconsistencies in digital education delivery, accreditation issues, and concerns about data privacy (Ajayi, 2020). Moreover, there is a gap in the integration of digital education strategies within the national education policy, leaving institutions to adopt ad-hoc approaches without standardized guidelines.

Proposed Solutions The Nigerian government must develop and implement a national policy for digital education that provides clear guidelines on issues such as accreditation, quality assurance, data privacy, and curriculum standards. This policy should also outline a framework for funding digital education initiatives, ensuring that resources are allocated to improve technological infrastructure, teacher training, and student access to learning materials.

Institutions should collaborate with the National Universities Commission (NUC) and other regulatory bodies to ensure that distance learning programs are accredited and meet established academic standards. Additionally, a regulatory framework that protects student data privacy and safeguards against online exploitation should be implemented.

Supporting Evidence In 2019, the Kenyan government introduced the Kenya Education Cloud, a policy initiative designed to standardize digital education in schools and universities. This has led to the creation of a central repository for digital content and has improved access to quality learning resources for students across the country (UNESCO, 2020). A similar national policy in Nigeria could yield comparable results in terms of consistency and standardization.

5. Inclusivity

Challenges Inclusivity in digital education remains a major concern in Nigeria, particularly for students from low-income families, those in rural areas, and individuals with disabilities. According to a report by the United Nations Development Programme (UNDP) (2020), a significant percentage of the population in rural Nigeria does not have access to basic digital tools such as computers or smartphones, further exacerbating the educational divide. Students with disabilities also face challenges in accessing educational content that is not designed to accommodate their needs, such as those requiring sign language or screen readers.

Proposed Solutions To foster inclusivity, the Nigerian government and educational institutions must ensure that digital learning platforms are accessible to all students, including those with disabilities. This can be achieved by adopting universal design principles that take into account the needs of diverse learners. For instance, creating content that can be easily adapted for screen readers or providing video materials with captions and sign language interpretation is essential. Additionally, targeted programs should be developed to provide digital devices to students from low-income backgrounds. Public-private partnerships could be established to provide affordable or subsidized devices and internet access, particularly for students in rural areas.

Supporting Evidence Research has shown that inclusive digital education strategies improve learning outcomes for marginalized groups. For example, a study by Luckin et al. (2016) demonstrated that the integration of assistive technologies and accessible content led to improved academic performance for students with disabilities in the UK. In Nigeria, programs such as the Digital Literacy Initiative for Rural Areas, implemented by the Nigerian Ministry of Education, have shown promise in reducing the digital divide between rural and urban students (Ogunleye, 2018).

Conclusion

Implementing a digital teaching and learning framework in Nigeria's distance learning institutions requires addressing key challenges like infrastructure gaps, digital illiteracy, and limited access to devices. Solutions such as improving internet access, providing affordable data, and training educators in digital pedagogy are essential. Clear policies ensuring quality standards and data privacy will support effective implementation. Inclusivity, with efforts to provide resources to underserved communities and students with disabilities, is crucial. By investing in these areas, Nigeria can transform its education system, ensuring equitable access to quality digital education and empowering learners to succeed in the digital age.

Relevance to Nigeria's Education System

Nigeria's unique socio-economic and infrastructural landscape necessitates a tailored approach to digital education. The country's diverse population, with varying levels of access to technology, requires inclusive strategies that cater to both urban and rural learners. For instance, mobile learning initiatives, such as the use of SMS-based educational content, have shown promise in reaching students without internet access (Adewale, 2014).

Moreover, the growing youth population presents an opportunity to harness digital technologies for skill development and employability. By integrating digital literacy into distance learning programs, Nigeria can equip its workforce with the skills needed for the 21st-century economy. This aligns with global trends, as highlighted in UNESCO's Education 2030 agenda, which prioritizes ICT integration to achieve inclusive and equitable education (UNESCO, 2015).

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