



## DIGITAL INCLUSION AND RE-ENGINEERING EDUCATION FOR SUSTAINABLE DEVELOPMENT GOALS IN PUBLIC UNIVERSITIES IN RIVERS STATE



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### **Abstract:**

*The study examined Digital Inclusion and Re-Engineering Education for Sustainable Development Goals in Public Universities in Rivers State. Two research questions and two hypotheses were drawn. The study adopted a descriptive survey design. The population stood at 3,762 lecturers across public universities in Rivers State, which include University of Port Harcourt, Rivers State University and Ignatius Ajuru University. The sample size which stood at 362 respondents, was determined using Taro Yamen formula. Stratified sampling technique was use in selecting the respondents, comprising of 158 male lecturers and 204 femalelecturers in public universities in Rivers State. The instrument for data collection was a self-structured questionnaire titled: “Digital Inclusion and Re-Engineering Education for Sustainable Development Goals in Public Universities Questionnaire”. The instrument was validated by two experts in the field of Measurement and Evaluation in Rivers State University. The reliability of the instrument was determined using Cronbach Alpha method. A cumulative reliability index of 0.81 was obtained. The mean and standard deviation statistics were used to answer the research questionswhile the hypotheses were tested using z-test statistics at 0.05 level of significance. The findings of the study revealed that, Access to Digital Learning Tools and AI-Driven Personalized LearningenhanceSustainable Development Goals in Public Universities in Rivers State. Based on the findings of the study, it was recommended among others that, Governments and private sector stakeholders should invest in broadband infrastructure, public Wi-Fi, and affordable internet services to ensure that all students, especially those in rural and underserved communities, have reliable access to digital learning resources.*

**Keywords:** Digital Inclusion, Education, Public Universities, Sustainable Development Goals, Re-Engineering. Rivers State

### **Introduction**

In the 21st century, the role of education has expanded beyond literacy and knowledge dissemination to include fostering innovation, sustainability, and digital empowerment. As global societies shift toward technology-driven development, digital inclusion—the ability of individuals and communities to access and effectively use information and communication technologies (ICTs)—has become essential in driving the United Nations' Sustainable Development Goals (SDGs), particularly Goal 4: Quality Education. In this context, public universities in Rivers State, Nigeria, serve as pivotal institutions for shaping future-ready graduates who are equipped to address global challenges. However, the digital divide remains a significant barrier, limiting equitable access to quality education and technological resources among students and staff (Amadi&Wokocho, 2023).



Digital inclusion in public universities entails more than providing internet access or computer labs; it encompasses the equitable distribution of digital infrastructure, digital literacy training, accessible learning platforms, and inclusive policies that consider socio-economic disparities. When effectively implemented, it transforms traditional learning environments into innovative spaces that support collaboration, lifelong learning, and sustainable problem-solving. According to Okonkwo and Briggs (2024), digitally inclusive educational systems foster creativity, critical thinking, and adaptability—skills essential for achieving sustainable development in a knowledge-based economy.

Re-engineering education in this digital era involves a fundamental redesign of academic curricula, teaching methodologies, and administrative processes to align with emerging digital trends and global development priorities. In public universities, this shift requires investment in smart classrooms, e-learning platforms, digital research tools, and faculty development programs that encourage the integration of technology into pedagogy. As noted by Nwafor and Diri (2024), re-engineered education systems are not only more resilient to disruptions such as pandemics but also better positioned to deliver inclusive, high-quality learning experiences to diverse student populations. The types of digital inclusion and re-engineering education that enhance sustainable development goals in Public Universities include; Access to Digital Learning Tools and AI-Driven Personalized Learning.

Access to digital learning tools refers to the ability of students, educators, and institutions to utilize digital technologies and online platforms that facilitate teaching, learning, collaboration, and academic resource sharing. These tools include e-learning platforms (such as Moodle and Google Classroom), educational apps, virtual labs, digital libraries, multimedia content, and communication software that support interactive and personalized learning experiences. Access to such tools not only involves availability of hardware (e.g., computers, tablets, and smartphones) and internet connectivity, but also includes the necessary digital literacy skills and institutional support to use them effectively in educational settings (Ugochukwu and Fubara, 2023).

In the context of public universities, especially in developing regions like Rivers State, Nigeria, access to digital learning tools has become increasingly important for enhancing academic delivery, promoting inclusive education, and bridging the digital divide. According to Ugochukwu and Fubara (2023), digital learning tools enable remote and flexible learning, reduce dependency on physical classrooms, and provide students with broader access to global knowledge and academic resources. These tools are particularly crucial in post-pandemic education systems, where hybrid and online learning models have become integral to institutional continuity and student engagement. Moreover, access to digital learning tools supports the achievement of Sustainable Development Goal 4—Quality Education—by empowering learners with the technological competencies needed in a digital economy. It also enables innovation in curriculum delivery, assessment methods, and collaborative learning practices. As highlighted by Adeyemi and Briggs (2024), ensuring equitable access to these tools is essential for reducing educational inequality and preparing students for the demands of the 21st-century workforce. Universities that invest in digital infrastructure, capacity building, and inclusive policies are better positioned to improve student outcomes and remain competitive in a rapidly evolving global educational landscape.

AI-driven personalized learning refers to the use of Artificial Intelligence (AI) technologies to tailor educational content, learning pace, and teaching strategies to meet the unique needs, strengths, and preferences of individual learners. Unlike traditional one-size-fits-all approaches, AI-powered systems analyze data such as students' learning behaviors, performance trends, engagement levels, and areas of difficulty to create customized learning experiences. These systems can adjust the complexity of content, suggest supplementary materials, and even predict potential learning challenges before they occur, thereby improving learning outcomes and fostering academic success (Ibrahim and Worlu, 2024).

In higher education, especially in public universities, AI-driven personalized learning holds great promise in enhancing teaching and learning efficiency. According to Adebayo and Okafor (2023), AI algorithms embedded in learning management systems can recommend specific videos, readings, quizzes, or exercises based on a student's learning history, thereby promoting a more engaging and effective educational experience. This form of personalization also enables instructors to identify



struggling students early and intervene appropriately, thereby reducing dropout rates and supporting inclusive education practices. Furthermore, AI tools like intelligent tutoring systems and adaptive learning platforms help bridge the gap between diverse student capabilities in large classrooms, a common feature in public universities in Nigeria (Adebayo and Okafor, 2023). AI-driven personalized learning also supports the goals of lifelong learning and continuous skill development, which are essential in a rapidly changing, technology-driven world. As noted by Ibrahim and Worlu (2024), the integration of AI in education aligns with Sustainable Development Goal 4—Quality Education—by providing learners with equitable access to relevant, adaptive, and inclusive learning resources. This is particularly important in public universities within regions like Rivers State, where students come from diverse socio-economic backgrounds and often face varying levels of digital preparedness.

Sustainable Development Goals (SDGs) in public universities refer to the integration and implementation of the United Nations' 17 global goals within the operations, curriculum, research, community engagement, and institutional policies of higher education institutions. These goals, adopted in 2015 as part of the UN 2030 Agenda for Sustainable Development, aim to address pressing global challenges such as poverty, inequality, climate change, education, and health, through coordinated action and innovation. In the context of public universities, especially those in developing regions like Rivers State, Nigeria, the SDGs serve as a framework for transforming universities into engines of social impact, environmental responsibility, and inclusive growth (Eze and Obinna, 2023).

Public universities play a crucial role in the localization of the SDGs through their three core mandates: teaching, research, and community service. According to Eze and Obinna (2023), by embedding sustainability principles into academic programs, universities help equip students with the knowledge and skills necessary to solve real-world problems and drive positive change in their communities. Additionally, through interdisciplinary research, universities contribute to finding innovative solutions to local and global challenges such as food insecurity, energy transition, climate resilience, and gender equality (Oladipo and Iyalla, 2024). These institutions also foster partnerships with government, industries, and civil society to promote inclusive development and policy implementation. In practical terms, implementing the SDGs in public universities involves integrating goals such as quality education (Goal 4), gender equality (Goal 5), clean water and sanitation (Goal 6), affordable and clean energy (Goal 7), and climate action (Goal 13) into university projects, operations, and curriculum. For instance, some universities have adopted eco-friendly campus initiatives, promoted ICT-driven learning systems, and launched community health outreach programs aligned with the goals. As noted by Oladipo and Iyalla (2024), aligning university efforts with the SDGs not only enhances institutional relevance but also fosters a generation of responsible, globally aware graduates committed to sustainable development. However, challenges such as inadequate funding, policy inconsistency, and infrastructural deficits continue to hinder full-scale SDG integration in many public universities. Nonetheless, with the growing recognition of the university's role as a sustainability leader, there is increasing momentum to mainstream the SDGs through inclusive governance, curriculum reform, and strategic partnerships. Public universities in Rivers State, by embracing the SDGs, are better positioned to produce impactful research, influence development policy, and contribute meaningfully to Nigeria's sustainable future (Eze and Obinna, 2023).

Public universities in Rivers State face unique challenges in achieving digital inclusion and re-engineering education, including inadequate ICT infrastructure, erratic power supply, limited funding, and digital illiteracy among some staff and students (Ibe & Ogolo, 2023). These challenges have widened the gap between policy ambitions and practical realities. Despite government and institutional efforts to promote e-learning and digital transformation, implementation remains inconsistent across many campuses. A holistic approach that includes stakeholder collaboration, capacity building, and policy reform is needed to bridge these gaps and advance sustainable education goals.



### **Statement of the Problem**

Despite the increasing global recognition of digital technologies as powerful enablers of education and development, many public universities in Rivers State are still grappling with significant gaps in digital inclusion. The uneven access to digital infrastructure, such as reliable internet connectivity, modern computing devices, and electricity, continues to undermine students' and lecturers' ability to participate effectively in digitally-driven education. This digital divide has resulted in disparities in academic performance, limited exposure to global learning resources, and reduced engagement in digital skill-building opportunities. As the world rapidly transitions into a digital-first era, the exclusion of a significant portion of university stakeholders from digital tools poses a major threat to the achievement of Sustainable Development Goal 4, which advocates for inclusive and equitable quality education.

Furthermore, the current structure of higher education in many public universities remains outdated and insufficiently re-engineered to support the integration of technology in line with the Sustainable Development Goals (SDGs). Teaching and learning methods often rely heavily on traditional classroom approaches with limited incorporation of modern digital pedagogies. This lack of curriculum innovation, combined with inadequate training for academic staff on the use of digital tools, has weakened the universities' capacity to produce graduates who are globally competitive and capable of solving sustainability challenges. According to Okon and Amadi (2023), without a deliberate effort to re-engineer education to align with digital realities and the SDGs, public universities will continue to fall short in their role as drivers of sustainable national development.

In addition, institutional and policy frameworks that support digital transformation in public universities are often fragmented, underfunded, or poorly implemented. There is a lack of cohesive strategies that link digital inclusion efforts with educational reforms and sustainable development agendas. As noted by Ibe and Nkoro (2024), this disconnect has led to a slow pace of change, with many universities struggling to transition from analog to digitally inclusive systems. The failure to address these issues holistically threatens not only the achievement of the SDGs but also the overall relevance and resilience of public universities in Rivers State in an increasingly competitive and technologically advanced world. The study therefore investigates; What are Digital Inclusion and Re-Engineering Education for Sustainable Development Goals in Public Universities in Rivers State? And to proffer solutions to the stated problems.

### **Purpose of the Study**

The purpose of the study is to examine Digital inclusion and re-engineering education for sustainable development goals in Public Universities in Rivers State, Specifically, the objectives of the study are to:

Ascertain the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State.

Determine the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State.

### **Research Questions**

The study was guided by the following research questions:

To what extent does Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State?

To what extent does AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State?

### **Hypotheses**

The study was guided by the following null hypotheses at 0.05 level of significance.

There is no significant difference between the mean opinion scores of male and female lecturers on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State.



There is no significant difference between the mean opinion scores of male and female lecturers on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State.

**Methodology**

The study adopted a descriptive survey design. The population stood at 3,762 lecturers across public universities in Rivers State, which include University of Port Harcourt, Rivers State University and Ignatius Ajuru University. The sample size which stood at 362 respondents, was determined using Taro Yamen formula. Stratified sampling technique was use in selecting the respondents, comprising of 158 male lecturers and 204 female lecturers in public universities in Rivers State. The instrument for data collection was a self-structured questionnaire titled: “Digital Inclusion and Re-Engineering Education for Sustainable Development Goals in Public Universities Questionnaire”.The questionnaire consisted of two sections namely section A and B. Section A of the questionnaire was used to generate demographic information while section B consisted of questionnaire items addressing the research questions of the study. This section of the questionnaire was structured using a five-point summated rating response scale of: Very High Extent (VHE) = 5 points, High Extent (HE) = 4 points, Moderate Extent, (ME) = 3, Low Extent (LE) = 2 points, Very Low Extent (VLE) = 1 point. The instrument was subjected to face and content validity by two experts in the field of Measurement and Evaluation in Rivers State University. The reliability of the instrument was established using Cronbach Alpha method and a cumulative reliability index of 0.81 was obtained. 362 copies of the questionnaire were administered and 100% retrieved and were properly filled with the help of three trained assistants. Mean and standard deviation statistics were used to answer the research questions while the hypotheses were tested using z-test statistics at 0.05 level of significance.

**Result Presentation**

Research Question 1: To what extent does Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State?

Table 1: Mean Ratings of Respondents on the Extent Access to Digital Learning Tools Enhance Sustainable Development Goals in Public Universities in Rivers State

S/ N	Questionnaire Items	Lecturers (male) N= 158		Lecturers (female) N=204		Avera ge mean	Std	RMK
		$\bar{X}_1$	Std <sub>1</sub>	$\bar{X}_2$	Std <sub>2</sub>			
1.	Access to digital learning tools improves teaching and learning by offering flexible, interactive, and personalized educational experiences, thus ensuring inclusive and equitable quality education for all students.	3.78	0.88	3.67	0.89	3.73	0.89	HE
2.	By providing equal access to digital tools and resources, public universities can reduce inequalities in education, especially among students from rural or low-income backgrounds.	4.21	1.39	4.33	1.32	4.27	1.36	VHE



3.	Digital learning tools support advanced research, data analysis, and innovation, empowering students and faculty to contribute solutions to societal and developmental challenges.	3.19	0.78	3.28	0.77	3.24	0.78	HE
4.	E-learning platforms and open educational resources promote continuous education and upskilling, which are essential for employment and sustainable economic growth.	3.27	0.88	3.19	0.70	3.23	0.79	HE
5.	With inclusive access to digital learning, women and marginalized groups can participate more actively in education, reducing gender and social disparities in higher education.	3.11	0.76	3.30	0.86	3.21	0.81	HE
	Aggregate Mean/SD for male and female Lecturers	3.51	0.94	3.55	0.91	3.54	0.93	HE

Source: Field Survey, 2025.

Table 1 in response to research question 2 which states, to what extent does Access to Digital learning tools enhance sustainable development goals in Public Universities in Rivers State had the following opinion scores for both male and female lecturers. Mean scores of the male lecturers to questionnaire items 1, 2, 3, 4 and 5 were 3.78, 4.21, 3.19, 3.27 and 3.11 with standard deviations of 0.88, 1.39, 0.78, 0.88 and 0.76 while the mean scores of the female lecturers were 3.67, 4.33, 3.28, 3.19 and 3.30 with standard deviation of 0.89, 1.32, 0.77, 0.70 and 0.86. Furthermore, the mean set representing the average mean scores for both male and female lecturers were 3.73, 4.27, 3.23, 3.08 and 3.21; with standard deviation of 0.89, 1.36, 0.78, 0.79 and 0.81 respectively. The readings which were higher than the criterion mean of 3.00 indicated that Access to Digital learning tools enhance sustainable development goals in Public Universities in Rivers State to a high extent.

**Research Question 2:** To what extent does AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State?

**Table 2:** Mean Ratings of Respondents on the Extent AI-Driven Personalized Learning Enhance Sustainable Development Goals in Public Universities in Rivers State

S/ N	Items	Lecturers (male) N= 158		Lecturers (female) N=204		Average e mean	Std	RMK
		$\bar{X}_1$	Std <sub>1</sub>	$\bar{X}_2$	Std <sub>2</sub>			
6.	AI-driven personalized learning tailors' content to individual student needs, learning styles, and pace, thereby improving learning outcomes and ensuring more inclusive and equitable quality education.	3.72	0.89	3.75	0.84	3.74	0.86	HE



7.	By identifying at-risk students early through learning analytics, AI systems support timely interventions, reducing dropout rates and increasing student retention in public universities.	4.37	1.18	4.41	1.1	4.39	1.14	VHE
					1			
8.	Personalized learning environments offer flexible learning options that accommodate diverse needs, helping women and other marginalized groups access education on equal footing.	3.68	1.61	3.74	1.4	3.71	1.54	HE
					8			
9.	AI technology encourages innovation in curriculum delivery, research, and assessment, helping universities contribute to industry, innovation, and infrastructure development.	3.57	0.93	3.63	0.9	3.60	0.92	HE
					0			
5.	AI tools recommend continuous learning resources and skill upgrades based on students' interests and career goals, promoting lifelong learning and enhancing employability.	3.73	0.88	3.77	0.8	3.75	0.83	HE
					2			
	Aggregate Mean/SD for male and female Lecturers	3.81	1.10	3.86	1.0	4.56	1.06	VHE
					3			

Source: Field Survey, 2025.

Table 2 in response to research question 1 which states, to what extent does AI-Driven personalized learning enhance sustainable development goals in Public Universities in Rivers State had the following opinion scores for both male and female lecturers. Mean scores of the male lecturers to questionnaire items 6, 7, 8, 9 and 10 were 3.72, 4.37, 3.68, 3.57 and 3.73 with standard deviations of 0.89, 1.18, 1.61, 0.93 and 0.88 while the mean scores of the female lecturers were 3.75, 4.41, 3.74, 3.63 and 3.77 with standard deviation of 0.84, 1.11, 1.48, 0.90 and 0.82. Furthermore, the mean set representing the average mean scores for both male and female lecturers were 3.74, 4.39, 3.71, 3.60 and 3.75; with standard deviation of 0.86, 1.14, 1.54, 0.92 and 0.83 respectively. The readings which were higher than the criterion mean of 3.00 indicated that AI-Driven personalized learning enhance sustainable development goals in Public Universities in Rivers State to a high extent.

### Hypotheses Testing

1. There is no significant difference between the mean opinion scores of male and female lecturers on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State.



**Table 3:** Z-test Analysis on the Extent Access to Digital Learning Tools Enhance Sustainable Development Goals in Public Universities in Rivers State.

Respondents	N	$\bar{x}$	Std	DF	z-cal	z-crit	LS	Decision
Male Lecturers	158	3.51	0.94					
				360	0.81	$\pm 1.96$	0.05	
Female Lecturers								Accepted
	204	3.55	0.91					

Source: Field Survey, 2025.

The result on Table 3 above shows Z-test Analysis on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State. The result on the table showed that there is no significant difference between the mean opinion scores of male and female lecturers on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State. The result on the table further showed a z-calculated value of 0.81 which was less than the z-critical value of  $\pm 1.96$  at 0.05 level of significance and with a degree of freedom of 360, since the z-calculated (0.81) was less than the z-tabulated ( $\pm 1.96$ ), the null hypothesis was accepted which states that there is no significant difference between the mean opinion scores of male and female lecturers on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State.

2. There is no significant difference between the mean opinion scores of male and female lecturers on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State.

**Table 4:** Z-test Analysis on the Extent AI-Driven Personalized Learning Enhance Sustainable Development Goals in Public Universities in Rivers State.

Respondents	N	$\bar{x}$	Std	DF	z-cal	z-crit	LS	Decision
Male Lecturers	158	3.81	1.10					
				360	0.61	$\pm 1.96$	0.05	
Female Lecturers								Accepted
	204	3.86	1.03					

Source: Field Survey, 2025

Table 4 above shows Z-test Analysis on the extent AI-Driven personalized learning enhance sustainable development goals in Public Universities in Rivers State. The result on the table showed that there is no significant difference between the mean opinion scores of male and female lecturers on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State. The result on the table further showed a z-calculated value of 0.61 which was less than the z-critical value of  $\pm 1.96$  at 0.05 level of significance and with a degree of freedom of 360, since the z-calculated (0.61) was less than the z-tabulated ( $\pm 1.96$ ), the null hypothesis was accepted which states that there is no significant difference between the mean opinion scores of male and female lecturers on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State.

### Discussion of Findings

The findings of the study are discussed as follows:

Table 1 in response to research question 1 which states, to what extent does Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State. The result on the table 3 further showed a z-calculated value of 0.81 which was less than the z-critical value of  $\pm 1.96$  at 0.05 level of significance and with a degree of freedom of 360, since the z-calculated (0.81) was less



than the z-tabulated ( $\pm 1.96$ ), the null hypothesis was accepted which states that there is no significant difference between the mean opinion scores of male and female lecturers on the extent Access to Digital Learning Tools enhance Sustainable Development Goals in Public Universities in Rivers State. The findings are in line with Adeyemi and Briggs (2024) who opined that, ensuring equitable access to these tools is essential for reducing educational inequality and preparing students for the demands of the 21st-century workforce. Universities that invest in digital infrastructure, capacity building, and inclusive policies are better positioned to improve student outcomes and remain competitive in a rapidly evolving global educational landscape. Additionally, Ugochukwu and Fubara (2023) opined that, digital learning tools enable remote and flexible learning, reduce dependency on physical classrooms, and provide students with broader access to global knowledge and academic resources. These tools are particularly crucial in post-pandemic education systems, where hybrid and online learning models have become integral to institutional continuity and student engagement.

Table 2 above shows Z-test Analysis on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State. The result on the table 4 further showed a z-calculated value of 0.61 which was less than the z-critical value of  $\pm 1.96$  at 0.05 level of significance and with a degree of freedom of 360, since the z-calculated (0.61) was less than the z-tabulated ( $\pm 1.96$ ), the null hypothesis was accepted which states that there is no significant difference between the mean opinion scores of male and female lecturers on the extent AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State. This result was in line with that of Ibrahim and Worlu (2024) who maintained that, the integration of AI in education aligns with Sustainable Development Goal 4—Quality Education—by providing learners with equitable access to relevant, adaptive, and inclusive learning resources. This is particularly important in public universities within regions like Rivers State, where students come from diverse socio-economic backgrounds and often face varying levels of digital preparedness. Additionally, Ibrahim and Worlu (2024) argued that, unlike traditional one-size-fits-all approaches, AI-powered systems analyse data such as students' learning behaviours, performance trends, engagement levels, and areas of difficulty to create customized learning experiences. These systems can adjust the complexity of content, suggest supplementary materials, and even predict potential learning challenges before they occur, thereby improving learning outcomes and fostering academic success.

## **Conclusion**

Based on the findings of the study, the researcher concludes that; Access to Digital Learning Tools and AI-Driven Personalized Learning enhance Sustainable Development Goals in Public Universities in Rivers State to a high extent. Digital inclusion and the re-engineering of education are critical components in the drive toward achieving the Sustainable Development Goals (SDGs) in public universities, particularly in Rivers State. As higher institutions face mounting pressure to adapt to a rapidly changing global landscape, integrating digital technologies into academic, administrative, and research processes is no longer optional—it is essential. The fusion of digital inclusion with educational innovation presents a strategic pathway for public universities to strengthen their role as catalysts for sustainable development. Addressing the existing gaps in infrastructure, policy, and digital literacy will enable these institutions to adapt to contemporary challenges and better prepare students for meaningful participation in a knowledge-driven, sustainable global economy. The future of education in Rivers State depends on how effectively public universities can harness the power of digital transformation in achieving long-term development goals.

## **Recommendations**

Based on the findings of the study, the following recommendations were made: Governments and private sector stakeholders should invest in broadband infrastructure, public Wi-Fi, and affordable internet services to ensure that all students, especially those in rural and underserved communities, have reliable access to digital learning resources.

The government, private sector stakeholders and university management should prioritize and increase funding for the development of robust digital infrastructure, including high-speed internet



connectivity, reliable electricity, smart classrooms, and digital libraries. This foundational support is essential for enabling effective access to digital learning tools across all faculties and campuses.

Regular training and professional development programs should be organized for lecturers and administrative staff to enhance their digital literacy and proficiency in using modern educational technologies. This will empower them to adopt innovative, tech-enabled teaching methods aligned with sustainable development goals.

Public universities should incorporate digital skills and competencies into the general studies curriculum to ensure all students—regardless of discipline—are equipped with the technological knowledge required for academic success and sustainable development in a digital economy.

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