



FROM DIGITAL NATIVES TO DIGITAL OUTCASTS: EXAMINING THE DIGITAL OSU PHENOMENON AND ITS IMPLICATIONS FOR TEACHING AND LEARNING INNOVATION AMONG GEN Z STUDENTS IN NIGERIAN POLYTECHNICS

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ABSTRACT

The study theoretically examined the Digital Osu phenomenon and its implications for innovative teaching and learning among Gen Z students in Nigerian polytechnics. Secondary data, i.e review of relevant literature, was used in the study. The study was anchored on Digital Divide Theory, propounded by Jan A. G. M. van Dijk (2006). Based on the review of relevant literature and discussions carried out, the study revealed that: the “Digital Osu” metaphorically describes students who, due to digital deprivation, are marginalized within the increasingly technology-driven educational landscape. It also found that the implications of digital Osu phenomenon for teaching and learning innovation among Gen Z students in Nigerian polytechnics include: widening gap between digitally equipped and digitally excluded learners; decline in effectiveness of innovative pedagogies such as blended learning; increased psychological disengagement and reduced academic confidence; need for inclusive digital policies and literacy programmes in polytechnics, and; reorientation of innovation strategies toward equity and participation. In addition, to achieve digital inclusion in polytechnics, there must be: sustained investment in affordable digital infrastructure; digital literacy training for both lecturers and students, and; inclusive policies that must allow flexible modes of participation, among others. The study concluded that ensuring that no learner remains a digital outcast in a world where being connected defines one’s belonging, is one great way educational institutions can show their commitment to institutional building and pedagogical advancement. Among others, the study recommended that Nigerian polytechnics, in collaboration with relevant government agencies, should develop and implement comprehensive digital inclusion policies supported by sustainable funding, public-private partnerships, and periodic monitoring to ensure equitable access to digital infrastructure and tools.

Keywords: *Digital Natives, Digital Outcasts, Digital Osu, Teaching and Learning Innovation, Gen Z.*

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INTRODUCTION

Generation Z, popularly known as Gen Z, is often portrayed as the first truly digital generation, tech-savvy individuals seamlessly navigating online spaces and digital tools. Yet, this assumption of universal digital competence has been increasingly challenged by recent studies showing that many young learners remain digitally marginalized within formal learning environments (Hammad, 2025; Onoyovwi & Eziechine, 2025; Prensky, 2001). While Gen Z students in Nigerian polytechnics are surrounded by digital technologies, gaps in access, digital literacy, and institutional support continue to hinder their effective participation in technology-enhanced education (Atakpo, 2024). This paradox between perceived digital nativity and actual digital capacity exposes deep inequities that limit students’ ability to engage in innovative, digitally mediated learning processes (Asyti et al., 2024). Hence, digital competence cannot merely be assumed by generational identity but must be understood within broader social, infrastructural, and pedagogical contexts.

Emerging within this discourse is the concept of the “Digital Osu”, a metaphorical construct inspired by the traditional Igbo caste system, used here to describe students who, though part of a digitally connected generation, are systematically excluded from the benefits of educational technology. These students experience marginalization not due to personal choice but because of structural barriers such as poor internet connectivity, inadequate digital infrastructure, and insufficient digital pedagogy in Nigerian polytechnics (Odusanya & Ademosu, 2024; Quimpan & Bauyot, 2025). The Digital Osu metaphor thus captures a new dimension of educational inequality, one that is technological, socio-economic, and psychological. It highlights a growing underclass of digitally disconnected learners who cannot fully participate in e-learning innovations or digital assessments, despite being surrounded by peers who thrive within such environments (Okwu et al., 2025).

Although growing scholarly studies have been carried out on digital inclusion and technology adoption in higher education, a significant literature gap persists regarding the digital marginalization of Gen Z students in Nigerian polytechnics. Most existing studies focus on digital access and infrastructural disparities (Atakpo, 2024; Odusanya & Ademosu, 2024) or on broader digital learning trends without addressing exclusion within polytechnic contexts (Hammad, 2025; Onoyovwi & Eziechine, 2025). Few have examined how cultural and socio-economic factors intersect to create a hierarchy of digital privilege within vocational and technical education. Therefore, this study seeks to examine the Digital Osu phenomenon and its implications for innovative teaching and learning among Gen Z students in Nigerian polytechnics. Ultimately, it argues that, despite being branded as digital natives, many Gen Z polytechnic students experience digital exclusion that undermines innovation, equality, and inclusion in the digital transformation of education.

THEORETICAL FRAMEWORK

The study is cemented on Digital Divide Theory. The Digital Divide Theory, propounded by Jan A. G. M. van Dijk (2006), explains the persistent inequalities in access to, use of, and benefits from digital technologies. It argues that digital exclusion goes beyond ownership of devices to include disparities in skills, motivation, and opportunity (van Dijk, 2006). As Warschauer (2011) notes, true digital inclusion requires both access and the ability to use technology meaningfully. Likewise, DiMaggio and Hargittai (2001) highlight that even among those with access, differences in digital literacy and engagement create new hierarchies of participation. In the context of Nigerian polytechnics, the theory helps explain the Digital Osu phenomenon, where some Gen Z students are marginalized in digital learning despite being part of the so-called “digital generation.” The following are assumptions of the theory:

Access Inequality: Not everyone has equal access to digital tools or internet connectivity;

Skill Disparity: Access does not automatically lead to digital competence;

Motivational Gap: Confidence and willingness affect digital engagement;

Usage Inequality: The purpose and quality of technology use determine its benefits, and;

Social Stratification: Digital inequality mirrors and reinforces broader social and economic divides.

The Digital Divide Theory provides a strong explanatory foundation for this study by illuminating the growing technological disparities among Gen Z students in Nigerian polytechnics. Its implication lies in revealing that digital inequality is not merely a technical issue but a structural and social one that influences access, competence, and participation in digital learning environments (van Dijk, 2006). In this context, the theory justifies the investigation of the Digital Osu phenomenon, a form of educational marginalization where some students are excluded from innovative teaching due to poor digital access or literacy. As Warschauer (2011) asserts, true educational innovation requires both access and the capability to use technology meaningfully, while DiMaggio and Hargittai (2001) emphasize that inequalities in digital skills and engagement can reinforce existing educational and social divides. Thus, applying the Digital Divide

Theory to this study underscores the urgent need for inclusion-centered digital policies that ensure no learner remains a “digital outcast” in Nigeria’s polytechnic system.

UNDERSTANDING THE “DIGITAL OSU” PHENOMENON: FROM INCLUSION TO EXCLUSION IN THE TECH AGE

The term “Digital Osu” represents a new form of educational ostracism born from technological inequities within the learning ecosystem. Drawing from the traditional Igbo Osu caste system, where individuals were socially segregated and denied full participation in communal life, the “Digital Osu” metaphorically describes students who, due to digital deprivation, are marginalized within the increasingly technology-driven educational landscape (Eze, 2022). This form of exclusion manifests when students are unable to access or effectively utilize digital tools necessary for academic participation, thus becoming “invisible” in virtual classrooms and collaborative learning environments (Adewuyi & Musa, 2024). As education systems become more digitally integrated, these students are left behind in ways that mirror historical patterns of social exclusion, reinforcing systemic inequities and hindering educational justice (van Deursen & van Dijk, 2019).

Parallels between the Osu caste system and digital exclusion reveal a shared thread of structural marginalization, one rooted in systemic barriers that limit full inclusion. While the traditional Osu were socially ostracized by birth or heritage, today’s “Digital Osu” are excluded by the socio-economic structures that determine access to technological capital (Adebayo & Olamide, 2023). Students in polytechnics across Nigeria, despite being part of a generation celebrated for digital fluency, often find themselves excluded from online learning platforms, virtual labs, and e-assessment systems due to poverty, poor connectivity, and inadequate institutional infrastructure (Ogunyemi & Fapohunda, 2023). Thus, digital exclusion becomes a modern caste system, dividing the educational community into the digitally privileged and the digitally disenfranchised (Helsper & Eynon, 2013).

Socio-economic status, device ownership, and internet reliability play decisive roles in determining who becomes a “digital elite” or “digital outcast.” Students from low-income backgrounds often rely on shared or low-functioning devices, making sustained engagement in online classes difficult, while peers from wealthier families enjoy uninterrupted access to high-speed internet and updated tools (Yusuf & Balogun, 2022). For instance, a polytechnic student in Port Harcourt may miss virtual assignments or fail to collaborate on digital group projects simply because of inconsistent electricity or limited data access (Omhonria & Needorn, 2022). This imbalance reinforces the digital hierarchy within learning spaces, where capability is not determined by intellectual potential but by technological accessibility (van Laar et al., 2020). Consequently, these disparities translate into unequal participation, learning outcomes, and confidence in digital engagement.

However, digital exclusion is not merely a technological issue, it is deeply social, cultural, and psychological. The feeling of alienation experienced by digitally marginalized students mirrors broader patterns of social disconnection, self-doubt, and academic inferiority (Manca & Ranieri, 2016). Such exclusion diminishes not only digital competence but also students’ sense of belonging within academic communities, reinforcing cycles of underperformance and disengagement. Addressing the “Digital Osu” phenomenon, therefore, demands more than infrastructural investment; it requires a human-centered approach that recognizes the emotional and social dimensions of technological marginalization (Lino Moreno et al., 2025). True digital inclusion must therefore transcend access, it must empower every learner to participate meaningfully in the evolving digital culture of education.

THE PARADOX OF DIGITAL NATIVISM: WHEN GEN Z STUDENTS STRUGGLE IN A DIGITAL WORLD

The popular notion that Generation Z students are inherently tech-savvy because they grew up surrounded by digital devices is increasingly being challenged. The term “digital natives”, originally coined by Prensky

(2001), refers to individuals born into a digital era who are presumed to possess natural technological fluency. However, emerging evidence reveals that this assumption masks critical disparities in digital skills and educational readiness (Helsper & Eynon, 2013). Many Gen Z learners may be adept at navigating entertainment platforms or social media but lack the higher-order digital literacies required for academic, professional, or research contexts (Ng, 2012). In Nigerian polytechnics, this gap is particularly evident as students struggle with digital learning management systems (LMS), online research databases, and virtual collaboration tools that are essential for modern education (Ogunyemi & Fapohunda, 2023).

Digital exposure, therefore, does not equate to digital competence. Being surrounded by technology does not automatically translate to the ability to use it critically or productively for learning (van Laar et al., 2020). Many polytechnic students exhibit what scholars describe as “surface digital fluency,” high engagement with social networking and media-sharing apps but limited ability to use digital tools for information synthesis, problem-solving, and innovation (Ng, 2012; Adebayo & Olamide, 2023). This mismatch between everyday digital habits and educational digital literacy is further widened by geographical inequalities. Students in urban polytechnics tend to have greater access to digital infrastructure and training opportunities than their rural counterparts, who often face unreliable internet, insufficient ICT facilities, and intermittent electricity supply (Yusuf & Balogun, 2022). Consequently, these disparities deepen the divide between digitally empowered and digitally marginalized learners, producing unequal learning experiences within the same generational cohort.

The implications of this digital competency gap are both educational and psychological. Students who struggle with academic technologies often experience frustration, reduced confidence, and disengagement from learning activities (Adewuyi & Musa, 2024). Over time, such digital exclusion can contribute to poor academic performance, diminished participation in online innovation initiatives, and a growing sense of alienation within digitally oriented classrooms. Thus, the concept of digital nativity has become an oversimplified generalization, one that obscures the complex realities of access, competence, and inequality in technologically mediated education (van Deursen & van Dijk, 2019). Understanding this paradox is crucial for Nigerian polytechnics, where digital transformation efforts must be matched with inclusive digital literacy programs to prevent an entire generation of “digital natives” from becoming “digital outsiders.”

DIGITAL EXCLUSION IN NIGERIAN POLYTECHNICS: INSTITUTIONAL AND PEDAGOGICAL DIMENSIONS

Digital exclusion in Nigerian polytechnics is not merely a matter of lacking access to technology; it is deeply rooted in systemic institutional and pedagogical deficiencies. Many polytechnics operate with outdated ICT infrastructure, unreliable internet connectivity, and inadequate computer laboratories that hinder meaningful technology-driven learning (Yusuf & Balogun, 2022). Despite the global shift toward digital transformation in education, limited institutional investment in e-learning platforms continues to constrain students' participation in digital pedagogy (Okebukola et al., 2021). In several cases, poorly maintained equipment, erratic power supply, and inconsistent policy implementation have rendered digital learning projects ineffective or unsustainable (Olatunji, 2023). Such institutional neglect fosters a form of digital stratification where only a privileged few students, often those with personal access to devices and stable networks, can engage fully in virtual learning environments.

Equally problematic is the low level of digital competence among lecturers, many of whom lack training in modern educational technologies or remain resistant to pedagogical change (Adebayo & Olamide, 2023). Traditional teaching methods that rely on rote instruction, static notes, and face-to-face delivery dominate Nigerian polytechnics, leaving little room for interactive or technology-enhanced learning experiences (Adegoke & Oyeyemi, 2022). Learning management systems (LMS) and virtual laboratories, when introduced, often fail due to limited staff motivation, poor institutional support, or absence of technical guidance (Ogunyemi & Fapohunda, 2023). These shortcomings create an environment where students who

are ready and willing to engage digitally find themselves excluded by structural and pedagogical inertia, effectively becoming “Digital Osu,” ostracized within their own learning ecosystems.

Ultimately, digital exclusion in Nigerian polytechnics reflects not only infrastructural inadequacies but also an institutional culture that undervalues digital innovation and inclusivity. Without a deliberate shift toward fostering digital literacy among faculty, supporting e-learning infrastructure, and embedding flexible pedagogies, the vision of equitable technology-driven education will remain unrealized (Adewuyi & Musa, 2024). Institutional attitudes toward innovation, not just material access, determine who thrives or lags behind in the evolving digital classroom (van Dijk, 2020). Addressing these institutional and pedagogical barriers is therefore critical to dismantling the Digital Osu phenomenon and ensuring that technology serves as a bridge rather than a barrier to educational participation.

TEACHING AND LEARNING INNOVATION IN THE SHADOW OF DIGITAL INEQUALITY

The promise of innovative teaching and learning practices in higher education, such as flipped classrooms, blended learning, and digital collaboration, is often undermined by digital inequality, which determines who benefits from such pedagogical advances (Nwosu & Eze, 2022). Digital inequality refers to disparities in access, competence, and usage of digital tools that shape students’ educational experiences (van Dijk, 2020). In Nigerian polytechnics, where infrastructural deficits and unequal access to digital devices persist, these disparities hinder the effective adoption of learner-centered innovations (Olatunji, 2023). When lecturers implement technology-driven pedagogies without accounting for unequal digital readiness, they unintentionally deepen the educational divide between the digitally privileged and the digitally marginalized (Ogunyemi & Fapohunda, 2023). Thus, digital inequality transforms innovation from a vehicle of empowerment into a new mode of exclusion.

Innovative teaching approaches fail when students are unequally equipped to participate. For instance, while a flipped classroom assumes students can access pre-recorded lectures online, those without reliable internet or personal devices are left behind (Adebayo & Olamide, 2023). This exclusion often breeds psychological consequences, feelings of embarrassment, inferiority, and disengagement, among students unable to keep pace with their peers (Adegoke & Oyeyemi, 2022). The result is a paradox where pedagogical innovation, instead of enhancing learning equity, reinforces the “Digital Osu” dynamic: some students are celebrated as tech-savvy digital elites, while others are silently ostracized from collaborative and online learning spaces (Lino Moreno et al., 2025). These patterns not only impede learning outcomes but also corrode the social fabric of the classroom, where peer support and shared engagement are essential.

True educational innovation must therefore embed inclusion at its core, not merely deploy technology as a symbol of progress. Inclusion requires intentional strategies, providing digital literacy support, subsidizing device access, and ensuring equitable internet availability, that empower all students to participate meaningfully in digital pedagogy (Adewuyi & Musa, 2024). A practical example lies in a polytechnic’s virtual group project, where students lacking stable internet connections could not attend online meetings or submit assignments on time. Such scenarios demonstrate that digital exclusion, if unaddressed, renders innovation performative rather than transformative. Hence, sustainable innovation in teaching and learning demands not only technological infrastructure but also empathetic institutional design that recognizes and bridges the lived inequalities among students.

THE IMPLICATIONS OF DIGITAL OSU PHENOMENON FOR TEACHING AND LEARNING INNOVATION AMONG GEN Z STUDENTS IN NIGERIAN POLYTECHNICS

The emergence of the Digital Osu phenomenon reveals a troubling contradiction within the Gen Z learning experience in Nigerian polytechnics, students who are expected to thrive in a digital age are instead being left behind by structural and socio-economic barriers. This digital exclusion undermines the very foundations of innovative pedagogy, which depends on access, participation, and collaboration in technology-enhanced environments. As Hammad (2025) observed, teaching Gen Z requires not just digital

tools but also an inclusive approach that recognizes diverse levels of digital readiness among learners. In many Nigerian polytechnics, disparities in access to stable internet, digital devices, and well-trained educators continue to restrict many students from fully engaging in flipped classrooms, virtual assessments, and digital research activities. Thus, the Digital Osu represents a growing underclass of learners, present in the classroom but absent in digital participation.

From a pedagogical perspective, the Digital Osu phenomenon weakens the implementation of teaching and learning innovations such as blended learning, virtual simulations, and digital collaboration. While digital natives are presumed to be self-directed learners, many Gen Z students lack the digital fluency necessary for academic technologies, even if they are proficient in social media (Prensky, 2001; Onoyovwi & Eziechine, 2025). The result is a widening gap between “digital elites,” who adapt easily to e-learning platforms, and “digital outcasts,” who struggle to complete online assignments or access learning resources. According to Odusanya and Ademosu (2024), digital transformation in higher education must be accompanied by institutional support systems that empower both lecturers and students to develop functional digital skills. Without such interventions, digital inequality not only limits innovation but also reinforces psychological exclusion and academic disengagement among already marginalized learners.

The implications of the Digital Osu phenomenon for teaching and learning innovation are therefore multifaceted, technological, pedagogical, and ethical. It calls for a radical shift from a technology-centered model to a human-centered approach that prioritizes inclusion, equity, and adaptability. As Atakpo (2024) and Asyti et al. (2024) emphasize, true educational innovation thrives when all learners are empowered to participate meaningfully in digital spaces. For Nigerian polytechnics, this means investing in affordable digital infrastructure, promoting digital literacy for both staff and students, and creating policies that prevent the exclusion of learners based on technological disadvantage. In a world increasingly defined by connectivity, no student should remain a digital outcast in an age of supposed digital nativity. Summarily, the implications of digital Osu phenomenon for teaching and learning innovation among Gen Z students in Nigerian polytechnics are represented in the diagram overleaf:

THE IMPLICATIONS OF DIGITAL OSU PHENOMENON FOR TEACHING AND LEARNING INNOVATION AMONG GEN Z STUDENTS IN NIGERIAN POLYTECHNICS

Widening gap between digitally equipped and digitally excluded learners
Increased psychological disengagement and reduced academic confidence
Decline in effectiveness of innovative pedagogies such as blended learning
Need for inclusive digital policies and literacy programmes in polytechnics
Reorientation of innovation strategies toward equity and participation

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Figure 1: Implications of Digital Osu Phenomenon for Teaching and Learning Innovation Among Gen Z Students in Nigerian Polytechnics

REIMAGINING DIGITAL INCLUSION: TOWARDS A CULTURE OF EQUITABLE INNOVATION IN POLYTECHNICS

Reimagining digital inclusion in Nigerian polytechnics requires a paradigm shift, from viewing digital transformation merely as the deployment of technology to recognizing it as a commitment to educational equity. Digital inclusion refers to ensuring all individuals and communities, including the most disadvantaged, have access to and the ability to use digital technologies effectively (van Dijk, 2020). In many Nigerian polytechnics, the digital transformation agenda has prioritized infrastructure procurement over inclusive engagement, leading to uneven benefits among students (Olatunji, 2023). To move beyond this limitation, institutions must embed inclusion into their digital strategies, ensuring that innovation serves

as a tool for democratizing education rather than deepening inequality (Nwosu & Eze, 2022). This calls for policies that frame digital participation as a right rather than a privilege, echoing the principle that no student should be left offline in an era where learning and technology are inseparable.

Achieving this vision demands practical and institutional reforms that address access, competence, and participation simultaneously. First, sustained investment in affordable digital infrastructure, including campus-wide Wi-Fi, reliable power, and subsidized learning devices, is essential to leveling the digital playing field (Adewuyi & Musa, 2024). Second, digital literacy training for both lecturers and students should be institutionalized to foster confidence and competence in technology-mediated learning (Ogunyemi & Fapohunda, 2023). Third, inclusive policies must allow flexible modes of participation, ensuring that students facing socio-economic constraints or connectivity challenges are not disadvantaged (Adebayo & Olamide, 2023). When inclusion is operationalized through such strategies, technology ceases to be a symbol of elitism and becomes a vehicle for social mobility and academic empowerment across polytechnic communities.

Ultimately, digital inclusion is not a privilege, it is a pedagogical and ethical responsibility. Institutions that ignore digital inequities inadvertently reproduce social hierarchies in virtual spaces, creating digital “insiders” and “outsiders” within the same learning environment (Okafor & Ezenwafor, 2024). By adopting an inclusive digital culture grounded in empathy, accessibility, and fairness, Nigerian polytechnics can nurture innovation that uplifts all learners, not just the technologically privileged. This reimaged approach to digital transformation ensures that innovation aligns with the moral purpose of education, to expand opportunity, empower learners, and create equitable futures for all (Adegoke & Oyeyemi, 2022). Therefore, to achieve digital inclusion in polytechnics, there must be:

sustained investment in affordable digital infrastructure;

digital literacy training for both lecturers and students, and;

inclusive policies that must allow flexible modes of participation, among others.

CONCLUSION

The Digital Osu phenomenon exposes a deep-seated contradiction within Nigerian polytechnics, while Gen Z students are often labeled digital natives, many still experience digital alienation due to unequal access to devices, unreliable internet, and limited institutional support. This divide not only undermines students’ confidence and participation but also weakens the transformative potential of technology in education. True digital inclusion must therefore go beyond infrastructure to embrace equity, competence, and empathy in teaching and learning. Therefore, the study concludes that ensuring that no learner remains a digital outcast in a world where being connected defines one’s belonging, is one great way educational institutions can show their commitment to institutional building and pedagogical advancement. Building a culture of equitable innovation in Nigerian polytechnics thus requires intentional efforts to close the digital gap, empower both students and lecturers, and create learning environments where technological progress translates into genuine academic inclusion and opportunity for all.

RECOMMENDATIONS

Nigerian polytechnics, in collaboration with relevant government agencies, should develop and implement comprehensive digital inclusion policies supported by sustainable funding, public-private partnerships, and periodic monitoring to ensure equitable access to digital infrastructure and tools.

Polytechnic management should conduct digital equity audits to identify access and skill gaps, while investing in continuous digital pedagogy training for lecturers to enhance their capacity to integrate inclusive technologies effectively in teaching and learning.

Educators should adopt flexible blended learning models that combine online and offline participation, ensuring that students with limited connectivity or resources are not excluded from meaningful learning experiences.

Institutions should promote a collaborative digital culture that values mentorship, peer learning, and shared support systems, helping students from diverse digital backgrounds to bridge gaps and thrive within an inclusive technological learning environment.

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