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ABSTRACT

Counselling in Nigerian schools remains constrained by limited personnel, inadequate training, and infrastructural challenges, leaving many students underserved in their academic, psychological, and socio-emotional needs. With counsellor–student ratios far exceeding recommended standards, traditional approaches struggle to meet the demands of Nigeria's rapidly expanding school population. This paper explore Artificial Intelligence and Counselling in Nigerian Schools: Confronting Challenges while Unlocking Prospects. Artificial Intelligence (AI) offers promising solutions through tools such as chatbots, predictive analytics, and intelligent tutoring systems, which enhance accessibility, efficiency, and early identification of at-risk students. Drawing on the Diffusion of Innovations (DOI) framework, this paper examines both the opportunities and constraints of integrating AI into Nigerian school counselling, including issues of cultural localisation, ethical governance, infrastructural readiness, and sustainability. The discussion highlights hybrid models that combine AI-driven interventions with human expertise as the most viable pathway, ensuring empathy, ethical judgment, and cultural sensitivity are preserved. By outlining benefits, risks, and implementation strategies, the paper argues that responsible AI adoption can transform Nigeria's counselling ecosystem, bridging gaps in student welfare and promoting equitable, inclusive educational outcomes.

Keywords: artificial intelligence, school counselling, nigeria, chatbots, predictive analytics, intelligent tutoring systems, diffusion of innovations.

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I. INTRODUCTION

Counselling in Nigerian schools has historically centered on academic and career guidance, often provided by teachers doubling as counsellors, with little specialized training in psychological interventions (Adeniyi, 2018; Olayinka & Loto, 2020). This reactive approach intervening only when crises arise has left significant gaps in addressing the complex emotional, social, and psychological needs of students. The National Policy on Education (Federal Republic of Nigeria, 2013) recognizes guidance and counselling as vital for holistic student development, yet its implementation remains inconsistent, particularly across rural schools. According to the Counselling Association of Nigeria (CASSON, 2021), the recommended counsellor–student ratio is 1:300, but in practice, many schools have no trained counsellors, leaving students vulnerable to stress, anxiety, and depression. These gaps underscore the urgent need for innovative approaches to support student well-being.

The challenges are compounded by socio-economic and demographic pressures. Nigeria has one of the largest school-age populations in the world, with over 62 million children and adolescents enrolled in primary and secondary schools (UNESCO, 2021). This surge in enrolment intensifies the strain on already

inadequate counselling services. Studies show that over 30% of Nigerian adolescents report experiencing moderate to severe stress and anxiety symptoms, often linked to academic performance, family expectations, and economic hardship (Okeke & Ibenegbu, 2020). Rural-urban disparities further exacerbate the problem, as rural schools face limited funding, lack of counsellor training programs, and minimal access to mental health resources (Ajiboye & Bakare, 2019). These statistics highlight the inadequacy of the traditional counselling model to meet the growing demand for comprehensive psychological support.

Artificial Intelligence (AI) presents a promising avenue for addressing these challenges by extending the reach of counselling services, providing personalised support, and offering early interventions. AI-powered tools such as chatbots, predictive analytics, and intelligent tutoring systems can complement human counsellors by identifying at-risk students, automating routine assessments, and delivering round-the-clock support (Shum, Heffernan, & Ferguson, 2022). For example, AI-driven mental health applications have been shown to reduce anxiety symptoms by up to 25% among secondary school students in pilot programs across Africa (UNESCO, 2022). Additionally, predictive analytics can process attendance, academic records, and behavioural data to flag students needing urgent support, thereby reducing dropout risks (Adegbite & Yusuf, 2021). These innovations align with global trends where AI is increasingly being leveraged to enhance educational equity and mental health service delivery.

However, integrating AI into Nigerian school counselling is not without challenges. Concerns around digital infrastructure, cultural acceptance, and ethical governance must be addressed to ensure responsible implementation. According to the International Telecommunication Union (ITU, 2022), internet penetration in Nigeria stands at around 55%, with significant disparities between urban and rural regions. Limited access to reliable electricity and digital devices further constrains the adoption of AI-based interventions in many schools. Moreover, cultural stigma surrounding mental health often discourages students from seeking counselling, raising questions about whether AI tools can overcome these barriers without reinforcing them (Olayinka & Loto, 2020). Ethical issues such as data privacy, consent for minors, and algorithmic bias also require careful governance frameworks (WHO, 2022). Despite these challenges, AI offers a transformative opportunity to bridge gaps in Nigeria's counselling ecosystem if adopted within a robust policy framework, supported by training and capacity-building for school counsellors.

II. THEORETICAL FRAMEWORK

The Diffusion of Innovations (DOI) theory, developed by Everett M. Rogers (2003). Everett M. Rogers (1931–2004) was a renowned communication scholar and sociologist best known for formulating the *Diffusion of Innovations* theory. Born in Carroll, Iowa, USA, Rogers earned his PhD in rural sociology from Iowa State University in 1957. His work was influenced by observing how farmers adopted agricultural technologies, which laid the foundation for his innovation adoption theory. The theory provides a foundational framework for understanding how new technologies are adopted within social systems. DOI posits that innovations spread at varying rates across populations, with adopters categorized into innovators, early adopters, early majority, late majority, and laggards. The speed and extent of adoption are shaped by five attributes: *relative advantage, compatibility, complexity, trialability, and observability* (Rogers, 2003). These attributes are particularly useful in examining the adoption of Artificial Intelligence (AI) in Nigerian school counselling.

In this paper, relative advantage refers to the clear benefits AI brings, such as reducing counsellors' caseloads, enabling faster triage of at-risk students, and extending the reach of counselling services to underserved communities (Obi et al., 2022). Compatibility emphasizes the alignment of AI tools with Nigeria's unique educational curricula, multilingual environment, and the cultural ethos of counselling. If AI fails to adapt to indigenous languages or counselling traditions,

adoption will be hindered (Eze et al., 2021). Complexity relates to how easy or difficult AI platforms are to use. For many Nigerian schools, limited digital literacy and inadequate infrastructure can increase perceived difficulty, slowing adoption. Trialability involves piloting AI-based interventions in select states or local government areas (LGAs), which allows stakeholders to evaluate effectiveness before scaling up nationally. Finally, observability focuses on visible results such as reduced counselling wait times, improved school attendance, and enhanced student well-being, which can encourage wider adoption (Adegbite & Yusuf, 2021).

By applying DOI to Nigerian school counselling, the framework highlights both opportunities and barriers. Schools and policymakers are likely to adopt AI more quickly if the innovations are simple, culturally relevant, and visibly beneficial. Conversely, adoption may lag where infrastructure gaps, resistance to change, or concerns about cultural misfit dominate (Adeniyi, 2018; Olayinka & Loto, 2020). Therefore, DOI serves as a guide for designing implementation strategies that account for Nigeria's social, cultural, and educational realities, ensuring that AI enhances rather than disrupts counselling services.

III. CONCEPTUAL CLARIFICATION

3.1 Artificial Intelligence in Nigerian Schools

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to learn, reason, and make decisions (Russell & Norvig, 2021). In education and counselling, AI encompasses digital tools such as chatbots, predictive analytics, natural language processing (NLP), and intelligent tutoring systems, all designed to enhance decision-making, automate routine tasks, and provide scalable personalized interventions (Luckin et al., 2018). Within the Nigerian school system, AI in counselling can be defined as the deployment of algorithm-driven applications that assist counsellors in identifying at-risk students, delivering mental health support, and offering career and academic guidance in a more efficient and accessible manner (Obi, Nwachukwu, & Alabi, 2022). This clarification is important because AI does not replace human counsellors but rather complements their work by reducing caseloads and enabling proactive, data-informed interventions.

3.2 Counselling In Nigerian Schools

Counselling in Nigerian schools is traditionally understood as structured support services provided to help students navigate academic, psychological, vocational, and social challenges (Adeniyi, 2018). The National Policy on Education (Federal Republic of Nigeria, 2013) recognizes counselling as an essential service in promoting student welfare, yet its implementation has often been inadequate due to limited trained personnel, infrastructural deficits, and socio-cultural barriers such as stigma surrounding mental health (Olayinka & Loto, 2020). Conceptually, school counselling in Nigeria has evolved from a reactive, advice-giving practice to an increasingly comprehensive service that must now address complex issues including depression, substance abuse, and trauma. Against this background, the integration of AI offers a transformative opportunity to redefine counselling practices by introducing innovations that can bridge gaps in counsellor-student ratios, expand access to underserved areas, and ensure early detection of psychological risks (Adegbite & Yusuf, 2021).

3.3 Innovative Applications of Artificial Intelligence in Nigerian School Counselling

3.3.1 AI-Powered Chatbots and Virtual Agents

AI-powered chatbots and virtual agents are increasingly deployed in educational and counselling contexts, particularly to bridge gaps in access to mental health support. These digital tools provide psychoeducation, mood tracking, cognitive-behavioural micro-interventions, and crisis referrals, making them highly relevant in school counselling where counsellor shortages are acute. Research has demonstrated that chatbots enhance self-disclosure among adolescents and young adults due to the anonymity they afford, thus reducing the stigma often associated with

face-to-face counselling (Shum, Heffernan, & Ferguson, 2022). Similarly, Lattie et al. (2019–2022) found that students using mental health chatbots experienced modest reductions in anxiety and depression symptoms during short-term trials, though outcomes were heavily dependent on design quality, cultural adaptation, and safety protocols. In Nigeria, pilot projects documented in policy and ed-tech briefs show that chatbots integrated into popular platforms like WhatsApp and SMS have proven feasible, particularly when programmed in Pidgin English or indigenous languages to improve cultural and linguistic fit. These innovations suggest that chatbots can serve as first-line interventions, triaging and referring students to human counsellors for more complex issues, thus mitigating resource gaps in low-income settings.

3.3.2 Predictive Analytics and Early Warning Systems

Predictive analytics and early warning systems (EWS) leverage student data such as attendance records, coursework performance, and behavioural engagement on learning management systems (LMS) to identify at-risk students before challenges escalate. International studies indicate that when predictive analytics are embedded within structured pastoral care processes, they significantly improve early intervention and retention rates (Siemens & Baker, 2022). However, concerns remain regarding automation bias, which can arise when educators overly rely on algorithmic predictions without critical human judgment (Holmes et al., 2021). Within Africa, small-scale pilots in secondary and tertiary institutions suggest that dashboards using low-cost analytics tools can help counsellors prioritise outreach and tailor support plans effectively (Obi, Nwachukwu, & Alabi, 2022). For Nigeria, predictive systems offer promise if ethical considerations such as informed consent, data privacy, and bias auditing are systematically addressed. By equipping school counsellors with timely data, predictive analytics can move counselling from a reactive to a proactive model, enabling interventions that prevent school dropouts and psychological decline.

3.3.3 Intelligent Tutoring Systems (ITS)

Intelligent Tutoring Systems (ITS) are AI-driven platforms that adapt instructional content and feedback based on students' learning progress. Beyond academic gains, some ITS now incorporate affective computing to detect indicators of disengagement, frustration, or confusion signals that can prompt counsellor follow-up (Luckin et al., 2018). Empirical evidence shows that ITS not only enhance mastery of subject content but also positively influence students' self-efficacy, persistence, and overall well-being when combined with pastoral support structures (Holmes, Porayska-Pomsta, & Holstein, 2022). For Nigeria, ITS adoption could be transformative if systems are aligned with the national curriculum, optimized for low-bandwidth or offline use, and embedded with safeguards to ensure that well-being data is only shared with consent. Integrating ITS into counselling workflows could enable counsellors to monitor not only academic performance but also emotional and behavioural signals, facilitating holistic interventions that address both learning and psychosocial needs.

3.3.4 Cross-Cutting Findings

Across all modalities chatbots, predictive analytics, and ITS-the consensus in global literature is that hybrid models combining AI and human counselling consistently outperform AI-only approaches (Shum et al., 2022; Luckin et al., 2018). While AI offers scalability and efficiency, human counsellors provide the empathy, ethical reasoning, and cultural contextualization essential for effective support. For Nigerian schools, the effectiveness of AI hinges on ethical governance, cultural and linguistic localisation, and investment in counsellor capacity-building. Ethical frameworks must address data protection, confidentiality, and equity in access. Moreover, given infrastructural challenges such as unreliable internet and electricity supply, offline-first AI designs and device-sharing protocols are critical to ensure inclusivity (Eze, Chinedu-Eze, & Bello, 2021). Thus, the way forward for Nigerian school counselling is not to replace counsellors with AI,

but to integrate AI tools in ways that enhance their capacity to deliver timely, context-sensitive, and empathetic services.

3.4 Artificial Intelligence and Counselling in Nigerian Schools

Artificial Intelligence (AI) in counselling within Nigerian schools can be conceptually understood as a complementary framework that merges digital innovation with human expertise to address student needs. AI tools such as chatbots, predictive analytics, and intelligent tutoring systems offer scalability, accessibility, and efficiency by automating routine assessments, providing 24/7 psychoeducation, and identifying at-risk students early (Shum, Heffernan, & Ferguson, 2022; Obi, Okeke, & Adegbite, 2022). These technological advancements are particularly relevant in Nigeria, where counsellor–student ratios remain inadequate, and resource constraints hinder the delivery of comprehensive psychological services (Ajiboye & Bakare, 2019). However, while AI promises efficiency and reach, it cannot replicate the nuanced interpersonal skills of counsellors, such as empathy, cultural interpretation, and ethical discernment, which are indispensable for effective student support (Lattie et al., 2020).

Conceptually, therefore, the integration of AI into Nigerian school counselling is best understood as a hybrid framework, a model that leverages the strengths of both technology and human counsellors. This dual approach highlights AI as an enabler rather than a replacement, offering cost-effective and innovative pathways to strengthen counselling services while ensuring the preservation of human-centered values (Eze, Chinedu-Eze, & Bello, 2021; Luckin et al., 2018). Effective deployment in Nigerian schools requires striking a balance between technological innovation and human intervention, ensuring that AI solutions are localized to Nigeria's cultural and linguistic realities, ethically governed, and aligned with national education priorities. In this sense, the conceptual clarification underscores AI not as a substitute but as a transformative tool that, when integrated responsibly, can bridge gaps in student welfare, academic guidance, and psychological support across diverse school contexts in Nigeria.

3.5 AI Constraints and Enablers in Nigerian School Counselling

The adoption of Artificial Intelligence (AI) in Nigerian school counselling is shaped by several constraints and enablers that determine its feasibility, cultural fit, and long-term sustainability. These factors must be critically analyzed to ensure that AI interventions are both effective and contextually relevant within Nigeria's diverse educational landscape.

1. *Infrastructure:* Reliable internet and power supply remain uneven across Nigeria, with pronounced urban–rural disparities. For AI solutions to be impactful, tools must be designed with low-bandwidth and offline capabilities to accommodate rural schools where connectivity is limited (Adegbite & Yusuf, 2021; World Bank, 2022).
2. *Digital Literacy:* Variability in digital literacy among counsellors and school staff poses a challenge to AI adoption. Studies emphasize the need for professional development (PD) initiatives, micro-credentialing, and continuous coaching to build digital competence and confidence in using AI-driven platforms (Obi, Okeke, & Adegbite, 2022).
3. *Workforce:* With Nigeria's counsellor–student ratio often exceeding recommended limits, counsellor shortages and high caseloads increase the demand for automation in triage and routine assessments. However, it is critical to establish clear role delineation to avoid AI encroaching into areas requiring human empathy and ethical judgment (Ibrahim, 2019; Ajiboye & Bakare, 2019).
4. *Policy and Governance:* AI integration must align with national data protection regulations and Nigeria's emerging AI policy frameworks. Ethical issues such as consent procedures for minors, safeguarding protocols, and data security require strict compliance to build trust and legitimacy (Federal Republic of Nigeria, 2019; Shum, Heffernan, & Ferguson, 2022).

5. *Culture and Language:* Nigeria's linguistic diversity with over 500 languages and dialects shapes the communication needs of counselling services. Effective AI tools must support Pidgin English and major indigenous languages such as Hausa, Yoruba, and Igbo, alongside local idioms, to foster rapport and comprehension. Community engagement and co-design are critical in ensuring cultural congruence (Eze, Chinedu-Eze, & Bello, 2021).

3.6 Benefits and Opportunities of AI in Counselling Services

The integration of Artificial Intelligence (AI) into Nigerian school counselling services offers multiple benefits and opportunities for strengthening student support systems. When carefully implemented, AI tools can expand accessibility, increase efficiency, and promote equitable service delivery across diverse educational settings.

1. *Accessibility and Reach:* AI-powered platforms, such as chatbots and virtual agents, enable 24/7 first-contact support, providing discreet and stigma-free channels that encourage help-seeking behaviours among students (Shum, Heffernan, & Ferguson, 2022). This is particularly valuable in Nigeria, where stigma surrounding counselling often discourages students from accessing psychological services (Olayinka & Loto, 2020). AI tools can scale psychoeducation and screening to large student populations, ensuring wider reach than traditional methods.
2. *Early Identification:* Predictive analytics and learning management system (LMS) data can help identify at-risk students by monitoring behavioural patterns such as declining attendance, reduced participation, or abrupt grade changes (Siemens & Long, 2019). These data-informed insights allow counsellors to intervene proactively, reducing the escalation of academic and psychological challenges.
3. *Efficiency:* AI systems automate routine tasks like mental health screening, appointment scheduling, and reminders, enabling counsellors to focus their limited time and expertise on complex, human-centered cases (Obi, Okeke, & Adegbite, 2022). This reduces caseload pressures, especially in schools with high student–counsellor ratios.
4. *Personalisation:* Adaptive AI platforms can tailor interventions to the cultural, linguistic, and psychological contexts of students. Features such as multilingual support and culturally tuned prompts make counselling more relatable and effective for diverse Nigerian populations (Eze, Chinedu-Eze, & Bello, 2021). Personalised content also enhances student engagement and self-disclosure.
5. *Equity:* When designed with low-bandwidth, offline-first features, AI can extend counselling services to rural and low-resource schools, where access to trained counsellors is limited (Ajiboye & Bakare, 2019). However, equitable outcomes require intentional planning for device access and digital inclusion to avoid widening the digital divide (UNESCO, 2021).

3.7 Risks and Challenges of AI in Counselling Services

Despite its transformative potential AI in counselling services, integrating Artificial Intelligence (AI) into counselling services in Nigerian schools presents several risks and challenges that require careful governance to ensure safe and effective implementation.

1. *Data Privacy and Security:* The collection and processing of sensitive data from minors raise major ethical and legal concerns. Without stringent consent protocols, data minimisation, encryption, and controlled access, student confidentiality could be compromised (Floridi et al., 2018). In Nigeria, where digital literacy is uneven, ensuring informed consent from students and parents is a complex but essential safeguard.
2. *Algorithmic Bias:* AI systems trained on non-representative or imported datasets risk misclassification, disproportionately affecting vulnerable groups (Mehrabi et al., 2021). For example, predictive analytics based on Western datasets may fail to capture

socio-cultural realities of Nigerian students. Regular fairness audits and inclusion of localised data are necessary to mitigate bias and ensure equity.

3. *Cultural Incongruence:* If AI systems are poorly localised—ignoring Nigerian languages, idioms, and cultural norms—students may distrust or reject them. Research shows that cultural misalignment reduces both efficacy and user engagement in AI counselling platforms (Eze, Chinedu-Eze, & Bello, 2021). Tools must therefore be adapted to Nigerian socio-cultural contexts to ensure relevance.
4. *Over-reliance and Empathy Gaps:* AI lacks the emotional depth and ethical judgment of human counsellors. Over-reliance risks eroding the irreplaceable human connection needed in counselling relationships (Shum, Heffernan, & Ferguson, 2022). Escalation protocols must be built into AI systems to ensure high-risk cases are promptly referred to human professionals.
5. *Sustainability:* Many AI initiatives fail to progress beyond pilot phases due to vendor lock-in, licensing costs, and weak long-term planning (UNESCO, 2021). In Nigeria's resource-constrained schools, sustainability concerns are magnified. Adopting open standards, cost-effective procurement models, and government-supported digital infrastructure are key to avoiding stalled projects.

IV. CONCLUSION

The integration of Artificial Intelligence into counselling services in Nigerian schools represents both a challenge and an opportunity for transforming student welfare. While AI-powered tools such as chatbots, predictive analytics, and intelligent tutoring systems can expand access, enhance efficiency, and facilitate early interventions, their success depends on context-sensitive adoption, cultural localisation, and robust governance. Nigeria's infrastructural gaps, ethical concerns, and cultural attitudes toward counselling underscore the need for hybrid models where AI complements rather than replaces human counsellors. By aligning innovations with the Diffusion of Innovations framework, strengthening capacity through training, and embedding safeguards for privacy, inclusivity, and sustainability, Nigeria can unlock the potential of AI to address the widening gaps in counselling services. Ultimately, AI should be viewed not as a substitute for human empathy but as a catalyst for more responsive, equitable, and student-centered counselling systems across the nation.

V. IMPLEMENTATION PATHWAYS FOR AI IN NIGERIAN SCHOOL COUNSELLING

For Artificial Intelligence (AI) to be effectively and responsibly integrated into school counselling services in Nigeria, a structured and context-sensitive roadmap must be adopted. Such a roadmap must recognize governance requirements, build human capacity, localize tools for cultural relevance, strengthen infrastructure, and ensure sustainability and safety.

1. *National and State Policy:* The first step involves establishing a robust governance framework for AI in education and counselling. This includes clear regulations for minors' data, such as consent procedures, data minimisation protocols, Data Protection Impact Assessments (DPIAs), bias audits, and incident response mechanisms. Procurement standards should mandate low-bandwidth, multilingual, and interoperable AI tools that guarantee explainability and embed human-in-the-loop safeguards by design. Such a policy direction would ensure accountability and trustworthiness in deploying AI within schools.
2. *Capacity-Building:* Effective integration of AI depends on equipping school counsellors and educators with digital counselling competencies. Micro-credentialing programmes can strengthen AI literacy, ethics, safeguarding, and data interpretation skills. Beyond training, schools should identify and mentor "AI champions" in each institution, fostering communities of practice that sustain peer learning and professional growth. Embedding AI fluency into teacher training colleges and continuous professional

development frameworks would create long-term capacity.

3. *Localisation and Inclusion:* One of the most critical elements of AI adoption in Nigeria is cultural and linguistic relevance. Co-design processes involving students, parents, and counsellors can ensure solutions reflect local realities. Tools must support major Nigerian languages Hausa, Yoruba, Igbo as well as Pidgin English and local idioms to increase accessibility and trust. Furthermore, youth advisory boards can guide tone, reduce stigma, and ensure that digital counselling platforms resonate with the lived experiences of students, including those with low literacy.
4. *Infrastructure and Access:* For rural and underserved areas, infrastructure readiness is essential. Prioritising offline-first modes, such as on-device inference or lightweight models, ensures that services remain functional even with unreliable connectivity. Alternative channels such as SMS or USSD can provide fallbacks where smartphones are unavailable. In schools, privacy screens in counselling corners, device-sharing protocols, and reliable backup power through solar or UPS systems will enhance accessibility and confidentiality in resource-limited environments.
5. *Safety and Quality:* AI in counselling must adhere to stringent safety and quality assurance measures. This includes integrating risk-escalation protocols for crises such as self-harm, abuse, or trauma, while ensuring smooth referral mechanisms to safeguarding teams and external support networks. Continuous monitoring of outcomes such as reduced wait times, faster triage, and fairness in access is necessary to identify unintended effects and refine interventions. A system of iterative quality audits will help maintain trust in AI-driven solutions.
6. *Sustainability:* Finally, sustainability is crucial to prevent stalled or short-lived AI projects. Hybrid cost models that combine government investment, donor support, and affordable subscription frameworks can reduce financial strain on schools. Open-source components should be prioritized where feasible to avoid vendor lock-in, while procurement contracts must include vendor exit plans and data portability clauses. Such provisions would enable long-term adaptability, ensuring that AI solutions remain functional and scalable across Nigeria's diverse school contexts.

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