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Research Paper

Reimagining Teacher Education through Artificial Intelligence-Enhanced Pedagogy: A Study of Digital Instructional Innovation at the Nigerian Army College of Education, Ilorin

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Abstract
The integration of Artificial Intelligence (AI), particularly Generative AI (GenAI), into higher education offers transformative potential for teacher preparation. While existing scholarship largely reflects developed-world contexts, little is known about AI-enhanced pedagogy within teacher education in developing nations and military institutions. This study explores the pedagogical application of AI tools in the Nigerian Army College of Education (NACE), Ilorin, with the aim of developing a contextually grounded framework for AI integration that promotes digital literacy, academic integrity, and constructivist learning. Employing a qualitative case study approach, the research draws on curriculum analysis, instructor reflections, and student-generated AI-supported activities within NACE's Department of Education. Anchored in Critical Digital Pedagogy, AI Digital Literacy, and Constructivist Learning Theory, the study proposes a preliminary AI Integration Framework encompassing stages from ethical orientation to reflective practice. Findings reveal both enthusiasm for AI in instructional design and notable barriers including digital inequality, uneven AI proficiency, and concerns over assessment integrity. The study concludes that effective AI integration in Nigerian teacher education requires institutional policy reform, capacity building for educators, inclusive digital access, and scaffolded curriculum design. It offers a foundational model for advancing responsible and pedagogically robust AI adoption in teacher training across the Global South.

Keywords: *Artificial Intelligence In Education, Teacher Education, Generative AI, Critical Digital Pedagogy, AI Literacy, Nigerian Higher Education, Military Education*

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I. Introduction

The rapid evolution of Artificial Intelligence (AI), particularly Generative AI (GenAI) tools like ChatGPT and Microsoft Copilot, is catalysing a fundamental shift across the global educational landscape (Chiu, 2023; Dwivedi et al., 2023). These technologies challenge traditional pedagogies, assessment methods, and the very nature of knowledge acquisition and creation. In higher education, institutions worldwide are grappling with policy formulation, ethical guidelines, and practical strategies to harness AI's potential while safeguarding academic integrity (Australian Academic Integrity Network, 2023; TEQSA, 2023).

Teacher education occupies a critical juncture in this transformation. Future educators must not only learn to use AI tools effectively themselves but also be prepared to teach the next generation of students how to engage with AI ethically and critically (Jha et al., 2025). This dual mandate makes the integration of AI into teacher training programmes an imperative. However, much of the existing discourse and research on AI in education originates from and focuses on Western, technologically resourced contexts (Jisc, 2024; Watson & Rainie, 2025). There is a pronounced gap in understanding how these technologies are being adopted, adapted, and negotiated within teacher education in developing nations, where infrastructure, digital literacy, and resource constraints present unique challenges (Yusuf et al., 2024). The Nigerian Army College of Education (NACE), Ilorin, represents a unique and insightful case study. As a military-affiliated institution training future educators, it operates at the intersection of disciplined organisational culture, national educational mandates, and the pressing

need for 21st-century pedagogical skills. Exploring AI integration here offers insights into how specialised institutions in the Global South can navigate digital transformation.

This study, therefore, seeks to address this gap by asking: How can AI be meaningfully and ethically integrated into the teacher education curriculum at NACE, Ilorin, to enhance pedagogical practice and foster critical AI literacy among student-teachers? Guided by established theoretical frameworks, this paper presents an analysis of current practices, challenges, and opportunities, culminating in a proposed model for AI-enhanced pedagogy tailored to this context.

II. Theoretical Framework: Foundations for AI-Enhanced Teacher Education

To navigate the complex integration of AI in teacher education, a robust, multi-dimensional theoretical foundation is essential. This study synthesises three complementary frameworks to guide analysis and strategy development.

I. Critical Digital Pedagogy (CDP): Moving beyond instrumental uses of technology, CDP emphasises education as a practice of freedom and critical consciousness (Giroux, 2010; Morris & Stommel, 2017). It questions power structures embedded in digital tools and advocates for equitable, student-centred, and reflexive learning environments (Masood & Haque, 2021). In the context of AI, CDP demands that integration be guided by ethical scrutiny, a focus on human agency over algorithmic determinism, and the empowerment of learners to become critical interrogators of AI-generated content, not just passive consumers.

II. AI Digital Literacy: Digital literacy must evolve to encompass specific competencies for the AI age. This extends beyond technical proficiency to include the ability to critically evaluate AI outputs for bias, accuracy, and relevance ("hallucinations"), understand the ethical implications of data use, and employ AI tools transparently and responsibly (Cain & Coldwell-Neilson, 2024; Ng et al., 2021). For teacher educators and their students, this literacy is twofold: personal competency and the pedagogical skill to foster it in pupils.

III. Constructivist Learning Theory (CLT) & Bloom's Taxonomy: CLT posits that learners actively construct knowledge through experience and reflection (Bada, 2015; Hein, 1991). AI can be a powerful tool within this paradigm, serving as a catalyst for inquiry, a resource for exploration, and a subject for critical analysis. Bloom's Taxonomy (Bloom, 1956) provides a structured hierarchy for designing learning activities that progress from lower-order (remembering, understanding) to higher-order thinking (analysing, evaluating, creating). AI integration should be scaffolded to support this cognitive progression, using AI for foundational tasks while reserving higher-order synthesis and evaluation for human intellect (Perkins et al., 2024).

Figure 1 illustrates the synthesis of these frameworks into a cohesive model for AI-integrated teacher education, demonstrating how they collectively inform pedagogical design from philosophical grounding to practical application.

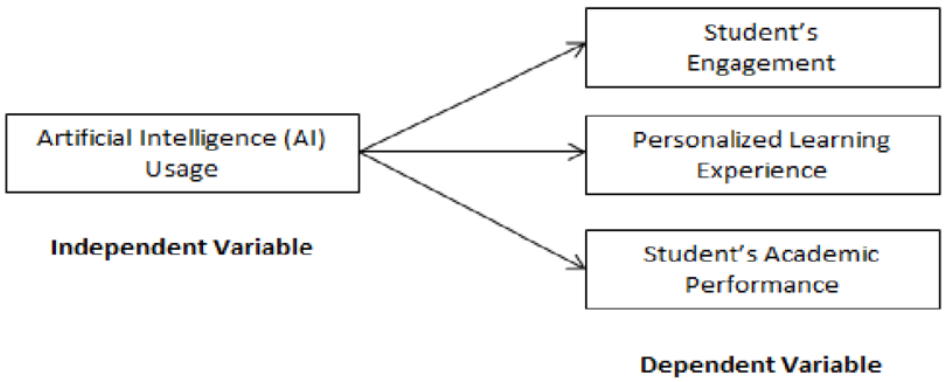

Figure 1: Conceptual Framework for AI-Enhanced Teacher Education

- *Core Competency (AI Literacy):* Critical evaluation, ethical use, prompt engineering, transparency.
- *Cognitive & Pedagogical Process (CLT & Bloom's):* Scaffolded learning activities progressing from Understanding/Analysing AI outputs to Evaluating/Creating with AI support.
- *Outcome:* The Empowered, Critically Literate Teacher-Educator.

IV. Methods

This study employed a qualitative, exploratory case study design (Yin, 2018) focused on the Nigerian Army College of Education, Ilorin. The purpose was to gain a rich, contextual understanding of the potentials and barriers to AI integration in teacher education within this specific setting.

Context: The case study is situated within the Department of Education at NACE, Ilorin, which is responsible for training Nigeria Certificate in Education (NCE) students to become primary and secondary school teachers. The institution has begun preliminary discussions on digital transformation but lacks a formalised AI policy.

Data Collection & Analysis: Data was gathered through multiple sources to ensure triangulation:

1. Document Analysis: Review of NACE's strategic plans, ICT policy drafts, and relevant curriculum modules.
2. Semi-structured Interviews: Conducted with five teacher-educators from the Department of Education to explore their awareness, attitudes, and perceived challenges regarding AI integration.
3. Analysis of Pedagogical Artifacts: Examination of existing assignment briefs and lesson plans to identify opportunities for AI enhancement, aligned with the theoretical framework.

Data were analysed thematically, with codes derived from the conceptual framework (e.g., "ethical concerns," "scaffolding," "infrastructure gap," "assessment redesign"). This allowed for the identification of recurring patterns and tensions relevant to the research aim.

Findings and Discussion: Opportunities, Challenges, and an Emerging Framework

1. Perceived Opportunities for AI in Teacher Education

Educators at NACE identified several promising applications of GenAI:

- Lesson Planning and Resource Development: AI seen as a tool to generate lesson ideas, create differentiated worksheets, and draft supplementary reading materials, thereby reducing administrative burden.
- Simulation of Teaching Scenarios: Potential for AI chatbots to simulate student interactions or parent-teacher conversations for practice in classroom management and communication.
- Enhancing Research and Critical Thinking: Tools like AI-powered literature search summarisers could help student-teachers engage with academic literature, provided they are taught to verify sources critically.

2. Salient Challenges and Constraints

Significant barriers to integration were consistently reported:

- Infrastructure and Access: Unreliable internet connectivity, limited access to up-to-date computers, and lack of institutional licenses for premium AI tools create a substantial digital divide.
- Variable AI Literacy: Both staff and students possess widely varying levels of familiarity with AI tools. Many educators expressed a lack of confidence in their own ability to use or teach about AI effectively.
- Academic Integrity Concerns: Fear of uncritical plagiarism and "cheating" via AI was paramount, especially in take-home essays and assignments. This risk is heightened in the absence of clear institutional guidelines.
- Curriculum and Assessment Rigidity: The existing curriculum and traditional assessment modes (heavy reliance on final exams and essays) were perceived as ill-suited to the fluid, process-oriented learning that AI integration often necessitates.

3. Proposed Framework: The NACE AI-Enhanced Pedagogy Model

Based on the theoretical lens and contextual findings, a process framework for integrating AI into teacher education at NACE is proposed (Figure 2). This model adapts the scaffolded, ethics-first approach evidenced in international studies (e.g., Jha & Atif, 2024) to the Nigerian context.

Figure 2: The NACE AI-Enhanced Pedagogy Process Framework

(A process flow chart would be inserted here with the following stages:)

1. Ethical & Technical Orientation: Mandatory workshops on AI ethics, limitations (bias, hallucinations), and basic tool proficiency for staff and students.
2. Scaffolded Integration in Methodology Courses: Introduce AI for low-stakes tasks (e.g., generating a lesson hook). Use a mandatory AI Use Declaration Template (adapted from Jha & Atif, 2024) requiring tool name, purpose, extracted text, and a reflective critique.
3. Critical Evaluation & Redesign: Student-teachers use AI to generate a lesson plan, then work in groups to critically evaluate its strengths, weaknesses, and cultural appropriateness before redesigning it.
4. Authentic, Process-Based Assessment: Shift assessments to value the process. For example, assess the quality of the critique and redesign (Step 3) rather than the initial AI-generated output. Incorporate viva voce (oral exams) on submitted work.
5. Peer Learning & Community of Practice: Establish faculty learning circles and student peer-review sessions to share prompts, ethical dilemmas, and innovative uses of AI in teaching.

V. Recommendations for Policy and Practice

For NACE and similar institutions to move from aspiration to implementation, a coordinated, multi-stakeholder approach is required:

1. Develop an Institutional AI Policy and Strategy: Leadership must formulate a clear, educative (not just punitive) AI policy aligned with national educational goals. This should define acceptable use, promote transparency, and support academic integrity (TEQSA, 2024).
2. Invest in Foundational Digital Infrastructure: Prioritise reliable campus-wide internet and provide secure access to core AI tools (e.g., via negotiated institutional licenses) to ensure equitable access.
3. Implement Mandatory Professional Development: Create ongoing training for teacher-educators focused on "AI Pedagogical Content Knowledge" (TPACK for AI), equipping them to model and teach with AI effectively.
4. Revise Curriculum and Assessment Design: Embed AI literacy as a core graduate attribute. Redesign assessments to be more authentic, process-oriented, and resistant to trivial AI completion—emphasising reflection, critique, and original synthesis.
5. Foster Partnerships: Collaborate with other colleges of education, universities, and EdTech organisations to share resources, develop contextual teaching materials, and conduct joint research on AI in teacher education.

VI. Conclusion

The integration of AI into teacher education at the Nigerian Army College of Education, Ilorin, is not merely a technological upgrade but a profound pedagogical imperative. This study has outlined both the significant potential of AI to enhance the preparation of future educators and the substantial challenges related to infrastructure, literacy, and integrity. The proposed NACE AI-Enhanced Pedagogy Model, grounded in Critical Digital Pedagogy, AI Literacy, and Constructivist theory, offers a scaffolded, ethical pathway forward. It emphasises transparency, critical evaluation, and the development of higher-order thinking skills. Successful implementation, however, hinges on committed institutional leadership, strategic investment, and a collaborative spirit among all educators. By embracing this challenge thoughtfully, NACE has the opportunity to become a leader in reimagining teacher education for the AI era in Nigeria, producing educators who are not only digitally proficient but also critically conscious and ethically grounded guides for the generations to come.

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