Reimagining Lecturers' Teaching Effectiveness in the Era of Artificial Intelligence: Implications for Nigerian Universities

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Abstract

Artificial intelligence has moved quickly from a peripheral curiosity to a fixture of university classrooms worldwide, and Nigerian higher education is no exception. This conceptual article asks what that shift actually means for lecturers' teaching effectiveness, drawing on the Technological Pedagogical Content Knowledge (TPACK) framework alongside Activity Theory. Intelligent tutoring systems, automated grading, adaptive courseware and generative AI tools have already begun changing how lecturers plan lessons, deliver content and assess students, often faster than institutions can keep pace with. Some of this is genuinely useful: feedback can be quicker, content more current, instruction more tailored to individual students than a lecturer working alone could manage. But the same tools complicate teaching in ways that are not yet well understood, and Nigerian universities face constraints, structural, ethical and financial, that will shape how much of AI's promise is actually realised. The paper works through this tension and proposes a contextualised AI-Enhanced Teaching Effectiveness (AETE) framework built for the Nigerian setting, together with policy recommendations for how institutions might rethink the lecturer's role as AI becomes routine. Whether any of this pays off will come down to unglamorous things: infrastructure spending, professional development that lecturers actually have time for, and clearer rules than currently exist. The paper concludes that AI will not on its own make lecturers more effective; effectiveness follows from how deliberately institutions and lecturers integrate it. Accordingly, it recommends that the National Universities Commission develop an explicit national policy on AI use in teaching and assessment, that universities embed AI literacy within existing continuing professional development structures rather than treat it as an add-on, and that government and institutional investment prioritise the infrastructure gaps that would otherwise leave less-resourced universities behind.

Keywords: *Artificial Intelligence, Teaching Effectiveness, Nigerian Universities, Lecturer Roles, AI-enhanced pedagogy*

Introduction

Ten years ago, few in higher education would have predicted how central artificial intelligence has become to university teaching. Intelligent tutoring systems and automated grading arrived first; generative AI tools producing lecture notes, essays and research summaries have followed, and the pedagogical ground has shifted under lecturers' feet. Lecturers remain central to knowledge transmission, but that role is under pressure from several directions at once (Selwyn, 2019).

Nigeria's higher education sector was already carrying real burdens before AI arrived: over 300 accredited institutions (NUC, 2026) serving a population expanding faster than capacity, alongside underfunding, patchy infrastructure and lecturer-to-student ratios considered unworkable elsewhere (Babalola et al., 2007; Okeke & Mtyuda, 2017). Used well, AI could close long-standing quality gaps; used carelessly, or unevenly, it could widen them.

What counts as teaching effectiveness is itself being rethought, as AI tools increasingly support, and in places replace, established markers of good teaching (Holmes et al., 2022). This article lays out the theoretical foundations, considers what effectiveness means under AI, maps the relevant tools, weighs opportunities against risks, and proposes a contextualised AI-Enhanced Teaching Effectiveness (AETE) framework with policy recommendations.

Theoretical and Conceptual Foundations

Two frameworks anchor the analysis. Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) model, building on Shulman (1986), holds that content, pedagogical and technological knowledge must intersect rather than sit beside one another; knowing a subject is not the same as knowing how an AI tool fits both, and that fit is not automatic (Koehler & Mishra, 2009). Zawacki-Richter et al. (2024) make a similar point about AI specifically, and for Nigerian lecturers building AI-relevant TPACK remains an urgent, largely unaddressed professional development gap.

Where TPACK focuses on individual knowledge, Engeström's (1987) Cultural-Historical Activity Theory (CHAT) looks at the wider system: how tools, rules, community and division of labour shape practice. Applied to a university, this means asking how an AI tool reshapes the whole activity system around a lecturer, not just what they individually know. CHAT does not assume this transition will be smooth; AI's arrival generates friction between efficiency and older, humanistic ideas about teaching, and between global AI trends and campuses with unreliable electricity (Engeström, 2001), friction worth naming honestly.

This raises the question of what teaching effectiveness in an AI context means, given the term has never had one settled definition (Stronge, 2018). This paper adopts a working definition, drawing on Stronge (2018) and Hattie (2009): teaching effectiveness is the degree to which a lecturer uses whatever is available, AI tools included, intentionally and responsively, in service of real student learning within their institution's constraints. Intentionality is the part of teaching hardest to automate; under this definition, a lecturer remains a reflective professional whose judgement matters, not a delivery mechanism AI runs alongside (Luckin et al., 2016).

The Multidimensional Nature of Teaching Effectiveness in AI-Mediated Environments

AI has not affected the dimensions of teaching effectiveness equally; content mastery and assessment have changed quickly, the relational side more slowly. A student can now get a usable answer to almost any factual question from a chatbot in seconds, which does not make a lecturer's expertise worth less but shifts what lecturers are needed for: helping students judge which instant answer to trust (Williamson et al., 2020). Adaptive platforms and simulations open a path away from the one-size-fits-all lecture, but only if lecturers manage the shift deliberately; otherwise AI-mediated instruction risks reproducing passive content consumption in more advanced form.

Engagement, one of the strongest predictors of learning outcomes (Fredricks et al., 2004), shows the limits of substitution most clearly. AI tools widen the channels for engagement, which matters in Nigeria given how little room large classes leave for one-on-one attention, but the relational side is harder to reproduce: Zepke (2014) found lecturer-student relationships drive motivation in ways that resist substitution, and in Nigeria's large lecture halls it is often a lecturer noticing a struggling student, not a chatbot, that keeps them enrolled.

Assessment is likely where AI's effect has shown up first, with automated tools delivering feedback at a scale no lecturer could match (Banihashem et al., 2024), genuine relief that still raises questions about what a machine grading actually measures. A human should remain part of the process where stakes are high.

Landscape and Opportunities for AI in Nigerian University Teaching

AI tools relevant to university teaching fall into four broad categories: content and curriculum support (generative drafting tools, literature-mapping platforms such as Semantic Scholar and Consensus); pedagogical delivery (intelligent tutoring systems and adaptive platforms such as Khan Academy and Duolingo, whose scaffolding VanLehn's (2011) review documents well); assessment and feedback (automated scoring, plagiarism detection, NLP-based commenting); and administrative support (at-risk flagging, scheduling). New tools appear every few months, so the categories matter more than any product.

Where these genuinely help in Nigeria is worth being specific, since each responds to a documented weakness rather than a generic promise. Open-access platforms and virtual laboratories supplement thin library holdings and limited practical facilities (Aina, 2013; Babalola et al., 2007). Automated grading and personalised pathways stretch lecturer attention further in Nigeria's high student-to-lecturer ratios, chasing Bloom's (1984) two-sigma result at a cost human tutoring alone could not match. Tools that speed up literature review give research-squeezed lecturers time back, feeding into teaching quality as well as publication counts (Muraina et al., 2025). AI-curated platforms and MOOCs could partly fill gaps left by underdeveloped CPD structures, though completion rates remain uneven (Dalipi et al., 2018), and multilingual, accessibility features could advance equity for students with disabilities alike (Luckin et al., 2016).

Barriers and Risks of AI Adoption

None of this comes free of complications. Every opportunity above depends on reliable electricity, internet and working computers, precisely where the Nigerian system continues to struggle (Muraina et al., 2025); without real infrastructure investment, most of this stays theoretical. Using AI well also requires the ability to critically evaluate its output and recognise its biases (Zawacki-Richter et al., 2024), and Agogbua et al. (2024) found preparedness still low across public universities in South East Nigeria, with lecturers reporting insufficient training and low confidence, a gap unlikely to close with a one-off workshop.

Generative AI has also triggered a crisis of confidence in traditional assessment: written examinations and essays remain dominant in Nigerian universities, and how easily students can now generate assessed work with AI raises real questions about what these assessments measure (Essien et al., 2024; Okonkwo & Ade-Ibijola, 2021), leaving lecturers to police use

and redesign assessments largely on their own, since institutional policy remains thin. A related risk is pedagogical deskilling, the gradual erosion of a lecturer's own instructional capability through over-reliance on AI-generated content (Selwyn, 2019); Biesta (2015) warned elsewhere about teaching becoming merely compliant rather than good, and if AI substitutes for judgement rather than supporting it, the result is likely more homogenised teaching.

Finally, access to AI tools is unlikely to be distributed evenly, probably tracking existing resource concentration in southern, urban, federally funded institutions (Muraina et al., 2025), deepening inequalities unless policy treats this as central (Babalola et al., 2007). Nigeria has no comprehensive national AI governance framework for higher education at the time of writing.

Towards an AI-Enhanced Teaching Effectiveness (AETE) Framework for Nigerian Universities

Together, the theory, the dimensions of effectiveness, the tools and the barriers point toward one question: what would it take for a Nigerian lecturer to teach well with AI, not merely alongside it? This paper proposes an AI-Enhanced Teaching Effectiveness (AETE) framework, built for the Nigerian context rather than adapted from elsewhere, resting on four dimensions.

AI-informed pedagogical agency holds that whether AI is adopted matters less than the judgement lecturers exercise in using it; lecturers need real agency in selecting and evaluating tools against their own goals and students, avoiding both uncritical enthusiasm and reflexive suspicion. Contextually responsive AI integration means models built for well-resourced settings elsewhere cannot simply be copied onto Nigerian campuses; in practice this favours low-bandwidth, offline-capable tools, indigenous-language support, and activities designed around students' actual socio-economic diversity (UNESCO, 2024; Muraina et al., 2025).

Collaborative and ethical AI practice treats integration as a shared achievement: communities of practice foster the reflection lecturers need to use AI responsibly, co-designing curricula and treating students as active participants rather than passive recipients, though sustained participation remains the main obstacle (Medina Vargas et al., 2025), alongside transparency about AI use and protection of student data (Holmes et al., 2022). Sustainable institutional enablement acknowledges that individual effort cannot substitute for institutional conditions: infrastructure investment, professional development embedded in existing CPD structures, consistent policy, and leadership that treats this as a priority.

Policy and Institutional Implications

A framework matters only if it changes what institutions and policymakers do. The National Universities Commission, with the Federal Ministry of Education, should develop a national policy clarifying what AI use is permissible in teaching and assessment, setting a baseline for digital infrastructure, and building AI literacy into CPD requirements, through genuine consultation with staff and students rather than leadership alone. University leadership should establish cross-functional AI governance committees, staff, students, IT, legal and pedagogical expertise represented, since visible leadership backing equitable adoption is what actually shapes whether lecturers feel able to experiment.

AI competency development belongs inside structured, discipline-specific CPD co-designed with staff around problems they actually face, not generic top-down training. Curriculum and assessment need genuine review of what AI changes about the competencies graduates require, with tasks designed to resist inappropriate AI use rather than relying on detection software alone. None of this works without matching investment in electricity, internet and device access for under-resourced institutions, guided by equity.

Conclusion

This article has worked through what artificial intelligence means for lecturers' teaching effectiveness in Nigerian universities, drawing on TPACK and Activity Theory to make sense of a multidimensional and genuinely unsettled picture. The opportunities are real but conditional, and the conditions, infrastructure, competency, governance, are largely not yet in place. The AETE framework proposed here is an attempt at a contextually grounded guide rather than an import from elsewhere: AI on its own does not make a lecturer more effective; thoughtful integration backed by real institutional support does.

Nigerian universities are training a workforce for a country of over 240 million people, which makes this a matter of national development, not just an academic talking point. Much of it remains conceptual and needs empirical grounding before it moves from proposal to something tested against reality.

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