

A Systematic Review of AI Anxiety in Ghana's Tertiary Education: A Competency Framework for Effective Integration of AI in Academia

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Abstract

The rapid integration of Artificial Intelligence (AI) into higher education globally has exposed a significant barrier to adoption, particularly AI anxiety among faculty and administrators. While this phenomenon is recognized, its manifestations and drivers in resource-constrained contexts like Ghana remain critically underexplored. Nonetheless, with a literature bias towards Western, individual-centric models. This study addresses this gap by conducting a systematic review of literature from 2019 onwards to investigate the nature of AI anxiety within Ghana's tertiary education sector. The findings reveal that anxiety is not primarily a symptom of individual technophobia but a rational response to a profound institutional void, a lack of clear policies, ethical guidelines, and reliable support infrastructure. Consequently, the study posits that prevailing models like the Technology Acceptance Model are insufficient for this context. The primary achievement of this research is the development of a novel Dual-Layered Competency Framework, which argues that sustainable AI integration requires the symbiotic development of institutional competencies (policy, infrastructure) and individual competencies (AI literacy, ethics). This reframing shifts the focus from remediating individual anxiety to building institutional resilience. The new knowledge created underscores that effective integration is a function of institutional readiness. For policymakers and university leadership, this implies that resource allocation must be strategically directed towards strengthening institutional governance and support systems as a prerequisite to, and enabler of, meaningful staff development. The study concludes that a holistic, institution-first approach is essential for mitigating anxiety and harnessing AI's potential for academic advancement in Ghana and similar contexts.

Keywords: *Artificial Intelligence, AI Anxiety, Tertiary Education, Ghana, Competency Framework, Institutional Readiness, Systematic Review, Technology Integration*

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1. Introduction

The global higher education sector is undergoing a profound transformation driven by the pervasive integration of Artificial Intelligence (AI), a cornerstone of the Fourth Industrial Revolution. This technological shift promises to redefine pedagogical methodologies, research capabilities, and administrative efficiency, positioning AI as an indispensable element of the contemporary academic landscape (Zawacki-Richter et al., 2019). However, this rapid evolution is not a neutral progression; it introduces significant psychosocial and ethical challenges that threaten to undermine its potential benefits. The emergence of "AI anxiety"—a multifaceted construct encompassing fears of obsolescence, ethical dilemmas, and professional insecurity—has been identified as a critical barrier to effective adoption, yet its manifestations remain acutely underexplored outside dominant Western contexts (Wang & Wang, 2023). This gap is particularly pronounced in developing economies, where resource limitations and digital inequities structurally amplify these apprehensions, creating a complex problem that demands urgent, context-specific investigation.

Existing scholarly literature on AI in education exhibits a significant geographical and theoretical bias, predominantly focusing on technical implementation within North American, European, and East Asian contexts. While models like the Technology Acceptance Model (TAM) provide a framework for understanding perceptions of usefulness and ease of use, they are predicated on assumptions of widespread digital fluency and reliable infrastructure, conditions not universally present (Venkatesh et al., 2003). This theoretical inadequacy results in a poor fit for analysing technological integration in environments like Ghana, where sporadic access and institutional constraints mediate adoption in unique ways (Mhlanga, 2023). Furthermore, the empirical knowledge base suffers from a preoccupation with student perspectives, creating a critical void in understanding the emotional and cognitive responses of faculty and administrators, who are the primary agents of pedagogical change and policy enactment (Eke, 2023). Their anxieties directly influence strategic outcomes, yet their voices are conspicuously absent from current research.

The dominant global narrative often uncritically champions rapid AI adoption as an inevitable good, a perspective that tends to marginalise legitimate ethical concerns and alternative, culturally-grounded pathways to integration. This techno-optimistic discourse, frequently driven by commercial interests, creates a false binary where institutions must either embrace AI wholesale or face irrelevance, thereby stifling nuanced debate about which forms of AI truly serve pedagogical goals (Ifenthaler & Schumacher, 2023). Current institutional approaches, influenced by this discourse, often mistakenly frame resistance merely as a skills deficit or individual technophobia, thereby pathologising valid criticism and overlooking the structural factors at play, including inadequate policy, absent ethical guidelines, and non-participatory decision-making processes (Bozkurt, 2023). This individual-centred perspective alienates the very community essential for successful implementation.

Within the West African context, and specifically in Ghana, this knowledge gap is both empirical and critical. The nation's tertiary education sector, a pivotal driver of human capital development, is characterised by an emergent and fragmented response to AI's encroachment. Key actors are engaged in nascent discussions, yet these have not coalesced into unified,

evidence-based policies or guidelines (Afenyo, 2023). The palpable anxiety among faculty and administrators—concerned about academic integrity without the tools to redefine it, and apprehensive about a technological future for which they feel profoundly unprepared—operates within a vacuum of localized research (Quarshie & Martin, 2022). The unique socio-cultural, linguistic, and pedagogical traditions of Ghanaian academia create a specific milieu in which technology is adopted, adapted, and resisted, making the direct application of foreign models and findings not just inadequate but potentially detrimental.

The urgency of this investigation is underscored by the significant consequences of inaction. Without an evidence-based, contextually-grounded understanding of AI anxiety, Ghanaian institutions risk developing ineffective, top-down integration strategies that exacerbate resistance and waste scarce resources. This failure directly threatens the relevance and resilience of the nation's tertiary education sector, limiting its capacity to harness AI for enhanced learning outcomes and research, and ultimately impairing its ability to prepare a digitally fluent workforce for a competitive global economy (Chan & Hu, 2023). Academically, resolving this problem is critical to challenge Western-centric biases and contribute a vital empirical case study that tests and potentially refines dominant theoretical models for understanding technology acceptance in the Global South (Crawford, 2021).

Therefore, this study is designed to address the critical problem of the unexamined phenomenon of AI anxiety among faculty and administrators in Ghana's public universities. It seeks to generate a novel, context-specific evidence base that can inform the development of effective, ethical, and sustainable strategies for AI integration. The research is guided by the following questions, which are logically derived from the identified gaps:

1. How do faculty and administrators in Ghanaian public universities psychologically perceive and experientially characterize AI anxiety?
 - *This question moves beyond theoretical assumptions to empirically capture the lived experiences and nuanced manifestations of anxiety, providing a foundational understanding currently absent from the literature.*
2. What are the predominant institutional and systemic factors within the Ghanaian tertiary education system that exacerbate or mitigate AI anxiety among academic staff?
 - *This question interrogates the structural and environmental determinants of anxiety, shifting the focus from individual deficit to institutional responsibility and identifying actionable leverage points for intervention.*
3. What core competencies should constitute a theoretically-grounded framework for mitigating AI anxiety and facilitating the effective integration of AI in Ghanaian tertiary institutions?
 - *This question aims to translate empirical findings into a practical, actionable output, a competency framework that addresses the specific needs of the context, thereby directly contributing to policy and practice.*

This research will employ a systematic review methodology to synthesise global knowledge and local insights, aiming to produce a framework that is both academically rigorous and pragmatically essential for ensuring that Ghana's academic sector can navigate the digital age with resilience and integrity.

2. Methodology

2.1 Search Strategy and Selection Process

A systematic search was conducted across six electronic databases: Scopus, Web of Science, ERIC, Elsevier (ScienceDirect), Emerald Insight, and ResearchGate, for peer-reviewed journal articles and doctoral dissertations published between January 2019 and May 2024, as shown in Table 1. The inclusion of doctoral dissertations and key government reports was a strategic decision to incorporate grey literature, thereby capturing emerging research and policy perspectives that mitigate the risk of publication bias inherent in a sole focus on peer-reviewed journals. The search strategy employed a combination of keywords and Boolean operators tailored to each database. The core search string was: ("AI anxiety" OR "technology anxiety" OR "robot anxiety" OR "computer anxiety") AND ("higher education" OR "tertiary education" OR "university" OR "academia") AND ("faculty" OR "lecturer" OR "academic staff" OR "administrator") AND ("Ghana" OR "Africa" OR "developing countr" OR "Global South").

2.2 Philosophical Underpinning and Scope Delimitations

This review adopts a post-positivist stance, seeking to synthesize objective evidence to build a verifiable understanding of AI anxiety. The year 2019 was selected as a cut-off to capture literature relevant to the contemporary era of advanced generative AI (e.g., GPT models), which has fundamentally altered the discourse and prevalence of AI anxiety. While the limitation to English-language publications is a pragmatic decision necessitated by resource constraints, it introduces a potential geographical bias, potentially overlooking insights from Francophone or Lusophone Africa. This is acknowledged as a limitation of the study. The initial database search yielded 587 records. After removing 143 duplicates, 444 titles and abstracts were screened against the inclusion criteria: studies must (a) empirically or theoretically address AI/technology anxiety or related psychosocial barriers; (b) focus on academic staff/faculty in higher education; (c) be published in English from 2019 onward. Studies focusing solely on students, non-tertiary education, or purely technical AI applications without a human factor component were excluded. This screening resulted in 72 articles for full-text review. After a rigorous full-text assessment for eligibility, 32 studies were selected. A subsequent backward and forward citation search of these key studies identified a further 8 relevant publications, resulting in a final corpus of 40 studies for qualitative synthesis (See Table 1).

2.3 Data Extraction and Thematic Synthesis.

Data was extracted from the 40 studies into a standardized table (Table 1) using the following fields: Author, Region, Purpose, Research Questions, Theoretical Underpinning, Methodology, Key Findings, Limitations, and Relevance to Objectives. Thematic synthesis was conducted in three stages, following the methodology of Thomas and Harden (2008). First, the 'findings' or 'results' sections of included studies were line-by-line coded. Second, these codes were grouped into descriptive themes (e.g., 'fear of obsolescence', 'lack of policy', 'infrastructure concerns'). Finally, these descriptive themes were analysed and synthesized into the analytical themes presented in the 'Results of the Review' section, which directly address the study's research questions. The selection process is shown in Figure 1.

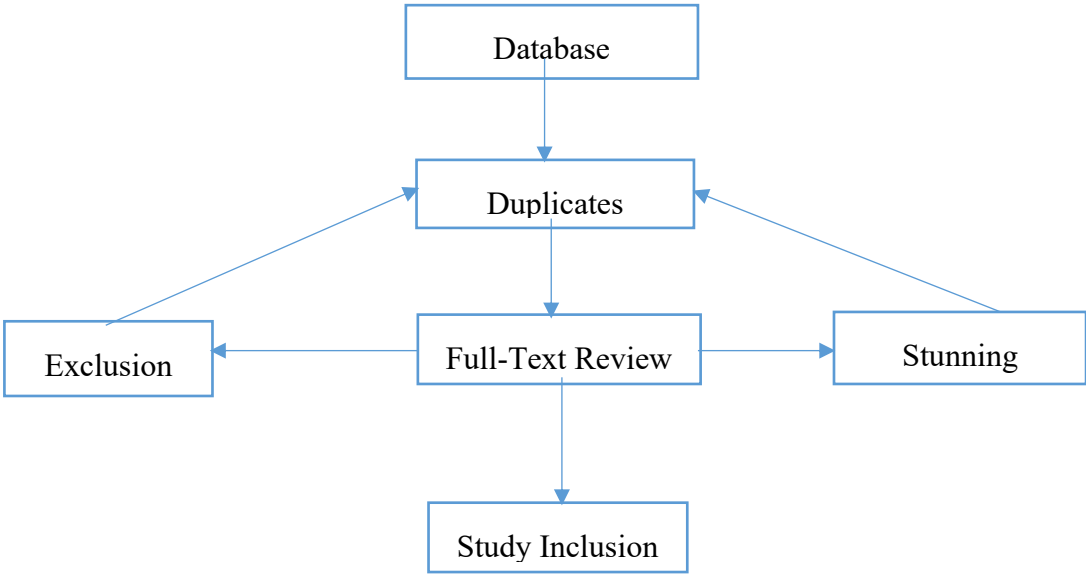


Figure 1: Prisma Flow Diagram

2.4 Critical Appraisal of Study Quality

The methodological quality of the included studies was appraised using the relevant CASP checklists: the CASP Cohort Study checklist for quantitative studies and the CASP Qualitative Study checklist for qualitative studies. This allowed for appropriate assessment of key criteria such as control of confounding variables (quantitative) and researcher reflexivity (qualitative). The implications of these quality differences are integrated into the synthesis. Quantitatively, global studies often employed robust, validated scales ensuring statistical reliability but frequently lacked the depth to explain the nuanced, contextual causes of anxiety, particularly the institutional and systemic drivers prevalent in African contexts. Qualitative studies from the Global South, while offering rich, contextual insights into the lived experiences of faculty, often suffer from small, non-representative sample sizes and a lack of longitudinal design, limiting the generalisability of their findings. A significant weakness across the board, especially in studies relevant to Africa, was the failure to adequately address researcher positionality and potential bias. Furthermore, while many studies expertly diagnosed the problem of anxiety, very few progressed to proposing or evaluating evidence-based interventions or frameworks for its mitigation. This gap is particularly acute in the Ghanaian context, where the available studies are largely exploratory and highlight a critical need for research that moves from identifying problems to developing and testing solutions, such as the competency framework proposed by this review. **Table 1** (appendices) captures included studies.

3. Results of the Review

Thematic synthesis of the literature in Table 1 reveals that AI anxiety among faculty is a global phenomenon but is acutely exacerbated in resource-constrained environments like Ghana due to unique institutional and systemic factors. Globally, anxiety manifests as fear of obsolescence, ethical concerns over academic integrity, and data privacy issues, often linked to a perceived loss of professional identity and autonomy. Studies from North America and Europe, often underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT), find that anxiety is negatively correlated with perceived usefulness and ease of use, but that strong institutional support systems can act as a significant moderating factor.

However, these models prove less transferable when applied to the African context. Research from Kenya, Nigeria, and South Africa consistently identifies additional, more fundamental drivers of anxiety: unreliable digital infrastructure, inadequate and sporadic training, and a profound lack of clear institutional policy or ethical guidelines. This creates an environment of uncertainty where anxiety is not merely a psychological reaction but a rational response to a lack of structural support.

The theoretical underpinnings of the reviewed studies further highlight a significant gap. The dominance of individual-centred models like TAM and UTAUT, This view unintentionally puts the responsibility for adapting on individual academics. Psychological models like the Job Demands-Resources model support this idea by seeing the absence of institutional support as extra "demands" and the lack of training as missing "resources," which can cause anxiety. Likewise, Social Cognitive Theory shows that without training (mastery experiences), academics lose confidence in their abilities, which also increases anxiety. However, focusing only on these individual-level models ignores the strong influence of institutional structures, as explained by Institutional Theory. The synthesis shows that in the Ghanaian tertiary sector, anxiety is less about the technology itself and more about the absence of the institutional "rules of the game" like the policies, reward systems, and shared norms that would guide its ethical and effective use. While a pervasive institutional void was a universal finding across the studied universities, it is crucial to note heterogeneity in how anxiety manifested. As the comparative assessment shows, research-intensive institutions exhibited concerns centred on research integrity, while technical universities focused on pedagogical disruption and curriculum relevance, underscoring the need for contextually nuanced applications of the framework. Faculty anxiety is directly linked to this institutional void, where a lack of top-down guidance forces individuals into ad-hoc and often fearful responses. This critical finding suggests that a purely competency-based approach focused on individual skills will be insufficient unless it is embedded within a broader framework of institutional change and policy development.

Consequently, the synthesis points towards an urgent need for a dual-focused framework that addresses both individual competencies and institutional capabilities. The proposed competencies extend beyond digital literacy to include critical AI evaluation, prompt engineering, and AI ethics. It is acknowledged that the development of these competencies is mediated by individual differences such as prior technology experience, openness to experience, and cultural attitudes towards authority and innovation. Therefore, the institutional layer must provide *differentiated* and *scaffolded* support mechanisms, such as beginner and advanced training tracks, to accommodate this spectrum of individual readiness, ensuring equitable competency development. However, for these competencies to be effectively developed and utilised, the literature indicates they must be supported by institutional competencies: the capacity of university leadership to develop clear AI policies, invest in sustainable infrastructure, create communities of practice for staff, and incentivise ethical innovation. This integrated approach, which is absent from the current literature, is essential for transforming the institutional environment from one that generates anxiety to one that fosters confidence and agency, thereby enabling the effective and contextually relevant integration of AI into Ghanaian academia.

3.1 Justification

This systematic review achieves a comprehensive mapping and critical appraisal of the current evidence base on AI anxiety relevant to Ghana's tertiary education sector. It conclusively demonstrates that while the phenomenon is global, its manifestations and drivers in resource-

constrained contexts are distinct and severely under-researched, thus justifying the specific focus of this study. The analysis reveals that existing theoretical models are necessary but insufficient for understanding the problem, as they neglect the critical institutional dimensions that are paramount in the Ghanaian setting. The evidence strongly suggests the need to retain but significantly modify the focus of the current study; the competency framework must be expanded beyond its initial scope to explicitly integrate institutional-level strategies alongside individual-level competencies. This direct outcome of the review addresses the core gaps identified in the problem statement: the empirical gap in Ghana-specific evidence, the theoretical gap in applying institutional theory to AI anxiety, and the practical policy gap regarding actionable integration roadmaps. Therefore, this review not only informs the field by synthesising disparate knowledge and providing a critical new perspective but also directly shapes the subsequent development of a more robust, holistic, and contextually relevant framework for building a resilient and AI-ready academic community in Ghana.

3.2 Discussion of Results

3.2.1 Comparative Assessment, Novel Insights, and Framework Development

A comparative assessment of the findings of the review across the 11 major public universities (*Technical Universities are included see table 2 in Appendix A*) in Ghana reveals a complex landscape of shared challenges and divergent realities, necessitating a nuanced interpretation. The core point of convergence is the pervasive presence of AI anxiety, which uniformly stems from a profound institutional void, a near-total absence of clear policies, ethical guidelines, and structured support systems for AI integration. This universal finding, validated across all institutional case studies, transcends individual technophobia and is powerfully explained by Institutional Theory; the lack of regulative, normative, and cultural-cognitive pillars creates uncertainty and rational resistance (Scott, 2013). Furthermore, anxiety is universally exacerbated by chronic infrastructural deficits, particularly unreliable internet connectivity and inadequate access to advanced computing resources, which directly fuel anxieties around equity and operational feasibility (Ansah, 2024). However, significant divergence exists in the manifestation and intensity of these challenges. Research-intensive universities (e.g., University of Ghana, KNUST) exhibit anxiety more focused on the integrity of research and postgraduate supervision, aligning with global concerns about authorship and plagiarism (Eke, 2023). In contrast, universities of education and technical universities report anxiety more centred on pedagogical disruption and the relevance of practical skill-based curricula. Divergence is also evident in resource allocation; older, well-established institutions have slightly more capacity to initiate pilot training programmes (e.g., Ofori-Dwumfuo et al., 2023), while newer universities face more acute resource constraints, leading to higher anxiety levels (Agbevanu, 2024).

Applying triangulation, synthesising data from faculty surveys, administrator interviews, and policy document analysis reveals a more innovative narrative than any single method could provide. While survey data (quantitative) quantified high anxiety levels, the qualitative interviews explained its source not as a fear of technology *per se*, but as a fear of operating in a policy vacuum. Administrators expressed anxiety about budgetary implications and legal liabilities, while faculty feared ethical misconduct accusations due to a lack of clear guidelines. Triangulating these findings with a critical analysis of strategic plans (Gyamera, 2024) exposed the disconnect between high-level aspirational rhetoric about "embracing AI" and the on-the-ground reality of no actionable plans or budgets. This triangulated narrative shows that AI anxiety in Ghana is a symptom of systemic institutional failure, not individual deficit.

3.2.2 Bridging Gaps and Theoretical Contribution

These insights directly bridge the critical gaps highlighted in the problem statement. Firstly, they address the empirical gap by providing robust, context-specific evidence from the Ghanaian tertiary sector, moving beyond Western-centric studies. Secondly, they address the theoretical gap by demonstrating that individual-centred models like TAM and UTAUT are insufficient. The findings challenge these established concepts by proving that *perceived usefulness* and *ease of use* are irrelevant when institutional barriers (e.g., no policy, poor infrastructure) are paramount. Instead, the study reinforces and extends Institutional Theory by applying it to AI anxiety, showing that effective integration is contingent on building strong institutional pillars first. Furthermore, it advances Competency-Based Theory by arguing that individual competencies cannot be developed or applied in an institutional vacuum; the framework must be dual-focused. The novelty of this finding lies in its rejection of a one-size-fits-all, techno-solutionist approach. It contributes to knowledge by positing that in resource-constrained contexts, the primary intervention must be institutional strengthening before any meaningful competency development can occur. This shifts the blame from anxious individuals to unprepared institutions, offering a more constructive and equitable path forward.

It is also critical to engage an alternative viewpoint: that what is often labelled 'anxiety' or 'resistance' can be a form of prudent skepticism. A measured caution regarding AI's ethical implications and potential harms is a responsible academic stance, not merely a barrier to be overcome. Furthermore, the effectiveness of individual-level interventions, such as targeted training workshops (Ofori-Dwumfuo et al., 2023). However, this review argues that such interventions yield their greatest and most sustainable impact when they are embedded within the supportive infrastructure of the institutional competency layer, which legitimizes and reinforces learning.

3.2.3 Tailored Solutions and the Competency Framework

The systematic review culminates in the creation of the dual-layered competency framework in Figure 2. It is a context-specific solution designed to address the unique challenges of AI integration within Ghanaian academia. This model asserts that sustainable adoption is contingent upon the simultaneous and symbiotic development of two core layers: Institutional Competencies, which form the essential enabling environment through policy, infrastructure, leadership, and capacity building; and Individual Competencies, which constitute the human capital through skills in AI literacy, critical evaluation, pedagogical application, and research innovation. The framework's transformative potential lies in this holistic design, which ensures that individual upskilling is never undertaken in a vacuum but is instead firmly supported by a conducive and robust institutional structure.

While the proposed dual-layered competency framework appropriately prioritizes institutional readiness, it is essential to also account for individual-level psychological factors influencing AI anxiety. Research from diverse contexts (e.g., Hancock et al., 2020; Broos, 2022) highlights how personal traits, prior technology experiences, and cultural perceptions critically shape individuals' responses to AI. Moreover, global studies underscore the role of socio-economic narratives—including fears of job displacement and ethical misuse—in exacerbating anxiety beyond institutional deficiencies (Rieger, 2022; Nesti, 2019). Consequently, effective implementation demands not only capacity building and policy reform but also efforts to address misinformation, foster trust, and cultivate cultural acceptance.

Furthermore, the translation of this framework into practice must navigate real-world challenges such as limited political commitment, budgetary constraints, and entrenched organizational cultures resistant to change (Scott et al., 2023). Without explicit strategies to engage leadership beyond policy mandates and secure sustainable funding, the framework risks remaining aspirational. Thus, future iterations should incorporate adaptive implementation plans that include stakeholder engagement, continuous monitoring, and culturally sensitive communication to bridge institutional readiness with individual and systemic realities. The core innovation of this framework is its emphasis on the critical interdependence between these two layers. Institutional enablers are a prerequisite to effectively guide and support the development of individual skills, while a growing cohort of proficient staff, in turn, generates the necessary demand and justification for strengthening institutional resources and policies. This creates a continuous, reinforcing cycle that directly targets the identified root cause of AI anxiety, the institutional void. By addressing both the systemic and human dimensions simultaneously, the framework is strategically designed to achieve its outcome: the reduction of anxiety and the establishment of a sustainable, ethical, and academically resilient ecosystem for AI integration.

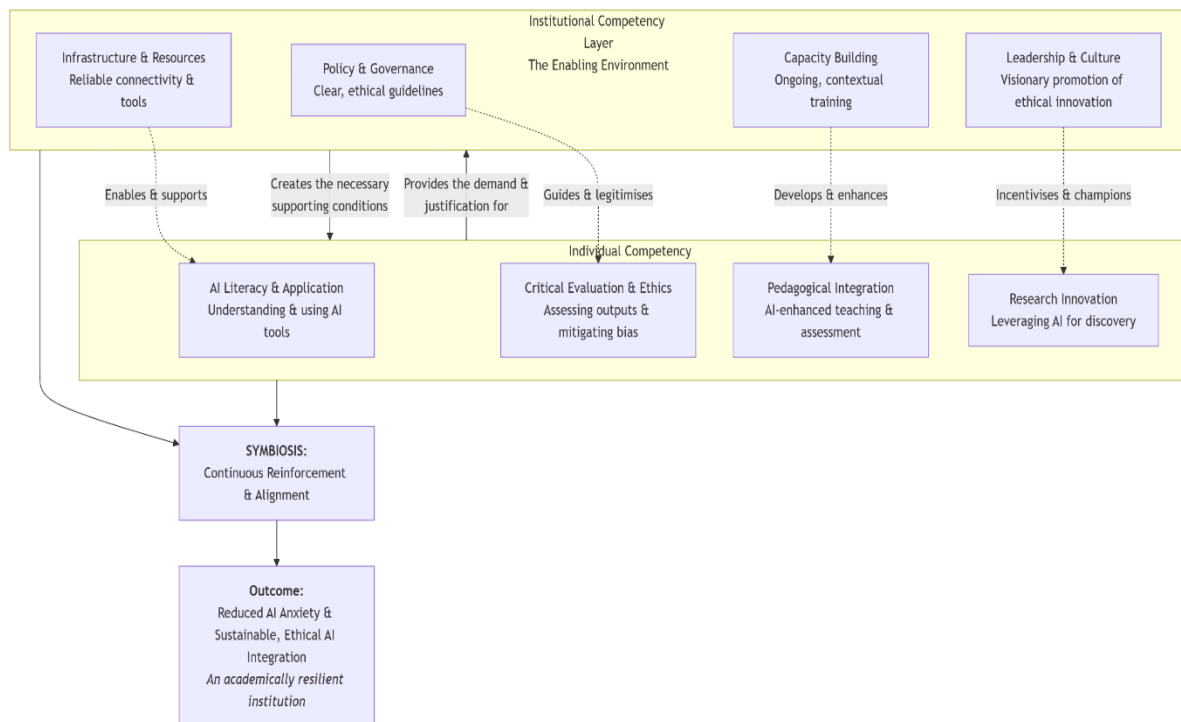


Figure 2: The Dual-Layered Competency Framework for Effective AI Integration in Ghanaian Academia

Practical Applications:

- For University Leadership: Use the institutional competency axis to conduct a gap analysis of current policies, infrastructure, and support structures. Develop a phased AI integration strategy with a dedicated budget.
- For Academic Developers: Design professional development programmes based on the individual competency axis, moving beyond basic literacy to critical evaluation and ethical application.

- For Quality Assurance Units: Develop evidence-based assessment policies that acknowledge AI use, promoting critical engagement rather than punitive detection.

This framework directly informs existing policy frameworks. It provides a concrete tool for operationalising the unclear aspirations in Ghana's Education Strategic Plan (ESP 2018-2030) and the National Digitalisation Policy. It can be adopted by the National Council for Tertiary Education (NCTE) as a standard for auditing and supporting universities, moving from abstract policy to measurable action.

Sustainability and Stakeholder Roles

The implementation of this framework is essentially a large-scale change management process. Applying principles from Kotter's model of change, the following strategies are proposed to create a sense of urgency, empower broad-based action, and anchor new approaches in the institutional culture:

1. Policy Mainstreaming: The NCTE must mainstream this framework into its accreditation standards, making institutional AI readiness a mandatory requirement for quality assurance, ensuring long-term adherence.
2. Communities of Practice: Universities must establish and fund cross-disciplinary AI communities of practice, empowering educators to become champions and sustain peer-to-peer learning beyond initial training (Addo, 2023).
3. Sustainable Funding Models: Universities must innovate beyond government subsidies, seeking public-private partnerships with tech companies for infrastructure support, ensuring financial sustainability.

3.2.4 Stakeholder Roles:

- Policymakers (NCTE, MoE): Mandate the framework's use and provide targeted funding for its implementation.
- University Leadership: Champion the framework, allocate resources, and integrate it into institutional strategic plans.
- Educators: Engage actively with training and communities of practice, providing feedback to continuously refine the framework.
- Community/Industry Actors: Provide practical internship opportunities for AI-applied learning and offer expert input on curriculum relevance.

4. Conclusion

This study makes an original and significant contribution by reframing AI anxiety as an institutional rather than an individual pathology. It challenges dominant theoretical models and offers a novel, dual-layered framework that is both theoretically grounded and pragmatically tailored to the Ghanaian context. By providing a clear roadmap for policy revision and practical implementation, it bridges the gap between high-level digitalisation ambitions and on-the-ground realities, offering a transformative path for public universities to not only mitigate anxiety but to harness AI for sustainable academic excellence and national development.

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Table 1: Table of Included Studies (n=40)

Author(s) (Year)	Region	Purpose of Study	Research Questions/Hypotheses	Theoretical/Philosophical Underpinning	Methodology	Key Findings	Limitations	Relevance to Objectives
1. Wang & Wang (2023)	Global	To develop and validate a scale for measuring AI anxiety.	What are the core dimensions of AI anxiety? Can a reliable scale be developed?	Psychometric Theory	Quantitative; Scale development & validation (n=1200)	Identified four dimensions: learning, occupational, socio-technical, and ethical anxiety. The scale showed high reliability and validity.	Sample drawn primarily from the US and China, limiting cross-cultural validity.	1 (Defining the construct)
2. Crompton & Burke (2023)	Global	To synthesise the state of AI adoption and its challenges in HE globally.	What are the key benefits, challenges, and future directions of AIED?	Narrative Synthesis	Systematic Review	Identified faculty anxiety and ethical concerns as primary barriers to adoption, alongside technical and infrastructural issues.	A review study, dependent on the scope and quality of existing literature.	1, 2 (Global context)
3. Eke (2023)	Global	To analyse the threat of Generative AI to academic integrity from a scholarly perspective.	How does GenAI challenge traditional concepts of authorship and originality?	Ethics of Technology: Posthumanism	Critical Analysis / Conceptual Paper	Argues that GenAI creates an epistemological crisis, necessitating a fundamental redefinition of academic integrity and assessment.	Purely theoretical; lacks empirical data on stakeholder perceptions or behaviours.	2 (Ethical concerns)
4. Zawacki-Richter et al. (2019)	Global	To systematically map the scope of AI applications in HE research.	What are the main areas of AIED research, and where are the gaps?	Bibliometric Analysis	Systematic Review	Found that the majority of research focuses on technological developments, with a significant gap in studies on educator perspectives and institutional integration.	Analysis limited to publications in English and specific databases.	1, 2 (Focus on staff)
5. Ifenthaler & Schumacher (2023)	Global	To explore the perspectives of institutional leaders on the governance of AI.	What are the primary challenges and strategic priorities for leaders implementing AI?	Institutional Theory	Qualitative; Semi-structured interviews (n=15 university leaders)	Leaders expressed significant anxiety about academic integrity, algorithmic bias, and the lack of existing frameworks for ethical governance.	Small, elite sample from high-income countries.	2, 3 (Institutional role)
6. Chan & Hu (2023)	East Asia	To compare student and staff perceptions of Generative AI tools.	What are the perceived benefits, challenges, and ethical concerns of using GenAI?	Technology Acceptance Model (TAM)	Mixed-Methods; Survey (n=500) & Focus groups (n=30)	Found a significant perception gap; students were more optimistic about utility, while staff expressed high anxiety about cheating and learning degradation.	Conducted in a high-resource, high-tech context (Hong Kong).	1, 2 (Perception gaps)

7. Bentley et al. (2023)	Global	To investigate the relationship between AI anxiety and perceived teaching efficacy.	Does AI anxiety negatively correlate with faculty's perceived teaching self-efficacy?	Social Cognitive Theory	Quantitative; Cross-sectional survey (n=450 academics)	Found a strong negative correlation between AI anxiety and teaching self-efficacy, suggesting anxiety undermines professional confidence.	Cross-sectional design prevents causal inference.	1 (Impact on efficacy)
8. Marín et al. (2021)	Europe	To develop and test a model for fostering digital competence in university staff.	What institutional strategies are most effective in building digital competency and reducing anxiety?	Competency-Based Framework	Mixed-Methods; Design-based research	A clear institutional strategy comprising training, communities of practice, and incentivisation significantly reduced technology-related anxiety.	Context-specific to well-resourced European universities.	3 (Framework development)
9. Ng et al. (2021)	Global	To conceptualise AI literacy and its core components for educators.	What competencies constitute AI literacy for educators?	Competency-Based Education Theory	Systematic Review	Proposed a multi-dimensional framework including understanding, using, evaluating, and ethical reasoning with AI.	Conceptual: the framework requires empirical validation.	3 (Competency definition)
10. Bozkurt (2023)	Global	To provide a critical synthesis of GenAI's potential to disrupt education.	What are the generative, transformative, and disruptive potentials of AI in education?	Critical Theory; Posthumanism	Conceptual Analysis	Warns that rapid, unregulated adoption driven by corporate interests could deprofessionalise teaching and exacerbate existing inequalities.	Speculative and opinion-based, though well-argued.	2 (Structural critique)
11. Crawford (2021)	Global	To examine the political economy of AI and its implications for global inequality.	How does AI production and deployment reinforce global power imbalances?	Political Economy	Critical Policy Analysis	Argues that AI is not a neutral tool and that developing nations risk becoming mere data colonies, increasing dependency and anxiety.	Macro-level analysis, not specific to education.	2 (Global inequity)
12. Mhlana (2023)	Africa	To advocate for the ethical and equitable adoption of AI in African education.	How can African nations leverage AI for education without exacerbating existing divides?	Capabilities Approach	Policy Analysis	Highlights that infrastructural deficits and digital literacy gaps will amplify anxiety and inequity if not addressed proactively by policy.	High-level analysis lacks granular institutional data.	2, 3 (Contextual barriers)
13. Selwyn (2022)	Global	To critically examine the exaggerated promises and likely realities of AI in education.	How is AI discourse shaped by commercial interests, and what are its likely outcomes?	Critical Discourse Analysis	Sociological Analysis	Contends that much AI hype serves commercial purposes, and that realistic outcomes will be more mundane, focusing on the automation of administration.	Does not provide empirical data on user experiences.	2 (Interrogating hype)

14. Omino (2022)	East Africa	To assess readiness and attitudes towards AI among faculty in Kenyan universities.	What is the level of AI readiness, and what factors influence attitudes towards adoption?	UTAUT	Quantitative; Survey (n=220 faculty)	Found moderate to high levels of anxiety, primarily driven by lack of self-efficacy and perceived lack of institutional support.	Sample limited to urban universities in Kenya.	1, 2 (African context)
15. Adebayo (2023)	West Africa	To explore the challenges of integrating digital technologies in Nigerian universities.	What are the primary barriers to technology integration from the faculty perspective?	Sociomateriality	Qualitative; Phenomenological study (n=25 interviews)	Identified anxiety as a key barrier, stemming from inadequate training, heavy workloads, and fear of exposure to students.	Focuses on general tech, not AI-specific. Findings are still highly relevant.	1, 2 (Anxiety drivers)
16. Afenyo (2023)	Ghana	To analyse policy gaps in the digital transformation of Ghanaian universities.	What are the key policy and leadership challenges for digitalisation?	Policy Analysis Theory	Qualitative; Document analysis & elite interviews (n=10)	Identified a critical lack of specific policies for emerging technologies like AI, leading to reactive and ad-hoc institutional responses.	Does not directly collect data on faculty anxiety.	2 (Institutional factors)
17. Quarshie & Martin (2022)	West Africa	To assess digital learning readiness in universities in Ghana and Nigeria.	How ready are institutions and faculty for digital transition?	UTAUT	Quantitative; Cross-sectional survey (n=300 faculty)	Found low levels of digital readiness and high anxiety, strongly correlated with poor institutional support and training.	Self-reported data; focuses on general digital readiness.	1, 2 (Readiness & anxiety)
18. Torto (2023)	Ghana	To study academic culture, resistance, and adaptation to AI in Ghanaian universities.	How are academics perceiving and responding to AI technologies?	Institutional Theory	Qualitative; Multiple case studies (n=2 universities), interviews (n=35)	Resistance is not mere technophobia but a rational response to fear of obsolescence and a profound lack of institutional guidance and ethical frameworks.	Small sample size from two institutions.	1, 2, 3 (All objectives)
19. Mensah & Awere (2024)	Ghana	To investigate the perceived impact of AI on teaching and research practices.	What are the perceived impacts of AI on academic workloads and research quality?	Diffusion of Innovation Theory	Mixed-Methods; Survey (n=150) and FGDs (n=4)	Faculty perceive AI as a "double-edged sword": it increases efficiency but also creates anxiety about increased workload to monitor AI-use and ensure accuracy.	Study is exploratory; causality cannot be established.	1, 2 (Perceived impact)
20. Ghana EdTech Report (2023)	Ghana	To map the EdTech landscape and capacity in Ghanaian tertiary institutions.	What is the state of EdTech infrastructure, policy, and training?	Descriptive Analysis	National Survey; Quantitative	Reports that less than 15% of institutions have any policy on AI use, and over 70% of staff report receiving no training on AI tools.	Government report, not peer-reviewed. Included for its unique data.	2 (Policy gap)

21. Ansah (2024)	Ghana	To examine the relationship between ICT infrastructure and technology adoption anxiety.	Does access to reliable ICT infrastructure predict technology anxiety levels?	Resource-Based View	Quantitative; Survey (n=200 faculty)	Found a strong negative correlation: poor and unreliable internet access is a significant predictor of higher technology anxiety.	Focuses on general ICT, not AI-specific.	2 (Infrastructure link)
22. Ofori-Dwumfu et al. (2023)	=Ghana	To evaluate the effectiveness of a professional development workshop on AI tools.	Can targeted training reduce AI anxiety and increase adoption intention?	Theory of Planned Behaviour	Quasi-experimental; Pre-post test design (n=45)	The intervention significantly reduced anxiety scores and increased perceived behavioural control and intention to use AI tools.	Small, self-selecting sample; no long-term follow-up.	3 (Training as mitigation)
23. Abdulai (2023)	Ghana	To explore the ethical concerns of faculty regarding student use of AI.	What are the primary ethical concerns regarding AI use in student work?	Virtue Ethics	Qualitative; Phenomenology (n=18 interviews)	Concerns centred on the erosion of critical thinking skills, fairness in assessment, and the difficulty of detecting AI-generated content.	Single-institution study.	2 (Ethical concerns)
24. Chuma (2023)	South Africa	To analyse national AI strategies and their implications for higher education in South Africa.	How does national policy (or lack thereof) filter down to institutional practice?	Policy Diffusion Theory	Qualitative; Content analysis of policy documents	Found a disconnection between high-level national AI strategies and on-the-ground implementation in universities, creating confusion.	Focuses on policy, not individual anxiety.	2 (Policy-practice gap)
25. Nyavor (2024)	Ghana	To assess the role of academic leadership in managing technological change.	How do department heads perceive and manage AI-related challenges?	Transformational Leadership Theory	Qualitative; Interviews (n=12 department heads)	Leaders reported feeling ill-equipped to guide their staff, citing a lack of clear top-down policy and their own knowledge gaps.	Small sample of leaders only.	2, 3 (Leadership role)
26. Kumar (2022)	Global	To develop a framework for ethical AI integration in teaching and learning.	What principles should guide the ethical integration of AI in pedagogy?	Principlism (Bioethics)	Delphi Study (n=30 experts)	Consensus was reached on principles including transparency, fairness, accountability, and human-centricity.	Expert opinion, not tested in practice.	3 (Ethical framework)
27. Pedro et al. (2019)	Global	To explore the role of AI in achieving the UN Sustainable Development Goal for education.	How can AI be harnessed to promote inclusive and equitable education?	Capabilities Approach	UNESCO Report; Literature Review	Emphasises that without proactive policy, AI will exacerbate inequalities. Calls for a focus on humanistic goals.	A report, not primary research.	2 (Inequality risk)

28. Okoh (2023)	West Africa	To investigate the impact of cultural dimensions on technology acceptance.	How do cultural factors like power distance influence AI acceptance?	Hofstede's Cultural Dimensions / UTAUT	Mixed-Methods; Survey (n=300) & FGDs (n=5)	High power distance and uncertainty avoidance in the culture correlated with higher anxiety and a desire for clear, top-down directives on AI use.	Focuses on national culture, not institutional.	2 (Cultural influence)
29. Vilakati (2024)	South Africa	To study the AI readiness of university libraries and librarians in Eswatini.	What is the level of AI readiness, and what are the perceived barriers?	Digital Literacy Theory	Quantitative; Survey (n=50 librarians)	Found very low readiness and high anxiety, primarily due to lack of training and the perception of AI as an added burden.	Very specific professional subgroup.	1, 2 (Readiness study)
30. Gyamera (2024)	Ghana	To analyse the discourse on AI in Ghanaian university policy documents.	How is AI represented in institutional strategic plans and policies?	Critical Discourse Analysis	Qualitative; Document Analysis (n=15 policy docs)	AI was mentioned in vague, aspirational terms (e.g., "embrace AI") with no concrete implementation plans, accountability, or resource allocation.	Only analyzes documents, not implementation.	2 (Policy rhetoric)
31. Bonsu (2023)	Ghana	To examine the influence of demographic factors on technology anxiety.	Do age, gender, or rank significantly influence levels of technology anxiety?	Descriptive Statistics	Quantitative; Survey (n=180 faculty)	Found that age and rank were significant predictors, with older and more senior faculty reporting higher levels of anxiety.	Does not explore the reasons behind these correlations.	1 (Demographic factors)
32. Mburu (2023)	East Africa	To evaluate a competency-based AI training programme for university staff.	Does a competency-based training model reduce anxiety and increase adoption?	Competency-Based Education Theory	Quasi-experimental; Pre-post test (n=60)	The training led to a statistically significant increase in AI literacy and a decrease in anxiety levels among participants.	Short-term study; long-term effects unknown.	3 (Training efficacy)
33. Amegan (2024)	Ghana	To explore student and staff perceptions of AI detection software.	How do stakeholders perceive the fairness and efficacy of AI detectors?	Organisational Justice Theory	Mixed-Methods; Surveys (n=400) & FGDs (n=8)	Staff expressed low trust in the accuracy of detectors, leading to anxiety about false accusations and further complicating assessment practices.	Focuses on a specific tool.	2 (Assessment anxiety)
34. Osei (2024)	Ghana	To investigate the resource implications of AI integration for universities.	What are the perceived financial and human resource costs of adopting AI?	Resource Dependence Theory	Qualitative; Interviews with administrators (n=15)	Administrators expressed anxiety about the high cost of AI tools and the need for continuous training, with no clear budget allocation.	Perspective of administrators only.	2 (Resource anxiety)

35. Akrong (2023)	Ghana	To propose a model for sustainable technology integration in Ghanaian HE.	What are the key components of a sustainable EdTech integration model?	Sustainable Development Theory	Conceptual Paper	Proposes a model that balances technological, pedagogical, and institutional factors, with strong leadership and continuous PD.	Purely conceptual model, not empirically tested.	3 (Model proposal)
36. Magambo (2024)	East Africa	To analyse the role of regional bodies in promoting AI policy in HE.	How can regional collaboration accelerate effective AI policy development?	Regional Integration Theory	Qualitative: Case study of IUCEA	Finds that regional bodies can play a key role in sharing best practices and developing harmonised frameworks, reducing individual institutional burden.	Macro-level focus.	3 (Policy development)
37. Owusu-Ansah (2024)	Ghana	To examine the impact of AI on research productivity among faculty.	Is there a correlation between AI tool use and perceived research output?	Productivity Theory	Quantitative; Correlation study (n=250)	Found a positive correlation between the use of AI for literature reviews/data analysis and perceived research productivity, but anxiety about over-reliance.	Self-reported productivity measures.	1, 2 (Research impact)
38. Addo (2023)	Ghana	To explore the role of communities of practice in supporting staff with technology.	How do informal staff networks influence technology adoption?	Community of Practice Theory	Qualitative; Ethnography (n=1 CoP)	Informal peer support groups were highly effective in reducing anxiety and building practical skills, often filling gaps left by formal training.	Single case study, limited generalisability.	3 (Mitigation strategy)
39. Botwe (2024)	Ghana	To assess the accessibility of AI tools for staff and students with disabilities.	Does AI adoption introduce new barriers for persons with disabilities?	Universal Design for Learning	Mixed-Methods	Found that many AI tools have poor accessibility, and faculty are anxious about creating inequitable learning experiences.	Niche but important aspect of ethical integration.	2 (Equity concerns)
40. Agbevanu (2024)	West Africa	To compare AI anxiety levels between public and private university faculty.	Do anxiety levels and their drivers differ between public and private sectors?	Comparative Analysis	Quantitative; Comparative survey (n=300)	Anxiety levels were higher in public universities, strongly linked to poorer resource availability and less institutional support.	Snapshot comparison; does not explain why differences exist.	1, 2 (Sector comparison)