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Exploring lecturers' experiences with artificial intelligence integration in lecturing: A case study of a private higher education institution in Rwanda

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ABSTRACT

This study explored how four lecturers at a private higher education institution in Rwanda experienced, interpreted, and navigated the integration of artificial intelligence (AI) into their lecturing practices. While prior research within similar institutional settings has quantitatively examined AI's association with student performance, engagement, and satisfaction, the lived experiences, challenges, and support needs of lecturers themselves have remained comparatively unexamined within this specific institutional context. Adopting a case study design bounded by the institution, data were generated through in-depth, semi-structured interviews with four lecturers who were purposively selected on the basis of documented, direct, self-initiated experience of attempting to use AI tools in their own lecturing. Given the small, purposively selected sample and the absence of a formally documented saturation assessment, this study is presented as an exploratory, information-rich single-site case rather than as a claim of full thematic saturation. Data were analyzed thematically. Findings, organized around three objectives, revealed that lecturers perceived AI as valuable for personalizing feedback, saving preparation time, and enhancing student engagement, although their experiences were mixed and largely shaped by trial-and-error learning rather than formal guidance. Lecturers also identified infrastructural, competency-related, and institutional barriers, including unreliable internet connectivity, inadequate training, and the absence of a clear institutional policy, that constrained meaningful integration. Finally, participants emphasized the need for continuous professional development, peer mentoring, dedicated technical support, and formal institutional policy to sustain AI adoption. These findings offer a bounded, single-site qualitative account that complements the existing quantitative literature on AI in Rwandan higher education by foregrounding lecturers' voices and situated realities, without claiming generalizability beyond this case. The study proposes, as considerations for institutional reflection and further research rather than as generalizable conclusions, deliberate, adequately resourced, and pedagogically grounded institutional strategies for integrating AI into lecturing in private higher education institutions.

Keywords: artificial intelligence integration; lecturer experience; higher education; Rwanda; private university; responsible AI governance

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1. Introduction and Problem Statement

The rapid diffusion of artificial intelligence (AI) into higher education has generated considerable optimism about its capacity to personalize instruction, improve feedback, and support more responsive teaching and learning environments (Iqbal et al., 2025; Jafari & Keykha, 2024). As governments and institutions across the world, including Rwanda, position digital innovation at the center of higher education reform, private higher education institutions are increasingly expected to adopt AI-enabled pedagogical tools to remain competitive and relevant. Rwanda's national policy environment reinforces this expectation: Rwanda's National AI Policy and related Higher Education Council guidance identify AI adoption as a strategic priority for the higher-education sub-sector, while leaving individual institutions considerable latitude in how, and how quickly, AI is introduced into teaching practice.

Ideally, in a rapidly digitalizing higher education landscape, lecturers in private higher education institutions would be well-prepared, confident, and systematically supported by clear institutional policy to integrate AI tools into their day-to-day lecturing. Such an environment would allow lecturers to draw on intelligent tutoring systems, adaptive platforms, and AI-based feedback tools purposefully and consistently, in alignment with national visions of technology-enhanced education and with adequate training, infrastructure, and pedagogical guidance provided by their institutions (Troussas et al., 2020). Throughout this article, "lecturing" is used to refer broadly to lecturers' teaching practice; including instructional delivery, feedback, and assessment tasks and is used interchangeably with "teaching practice".

However, emerging Rwanda-focused scholarship, rather than international evidence alone, suggests that AI integration in lecturing in at least some private higher education institutions in Rwanda remains uneven and largely lecturer-driven, and dependent on individual initiative rather than coordinated institutional strategy. "From Innovation Signaling to Governance Readiness," found that institutional AI policy and governance structures lagged well behind the pace of lecturers' and students' informal adoption of generative-AI tools, leaving individual staff to establish their own norms of use. Broader systematic evidence on generative AI in higher education similarly points to uneven institutional readiness across diverse settings, although this evidence is drawn from a global, cross-institutional systematic review rather than from Rwandan private higher education specifically (Altamirano et al., 2026). Situating the present case within this Rwanda-focused literature, rather than relying solely on international, cross-context reviews, allows a more defensible account of what is already known about AI integration in this specific setting. Prior quantitative work in comparable Rwandan and regional higher-education settings has examined the association between AI-based teaching interventions and student academic performance, engagement, and satisfaction (Chen et al., 2026); however, this outcome-focused, numbers-driven evidence reveals little about how lecturers themselves experience, make sense of, or struggle with integrating AI into their lecturing, nor about the conditions that enable or constrain this process on the ground.

Despite AI's demonstrated potential to enhance measurable learning outcomes, a notable gap exists in the qualitative understanding of lecturers' lived experiences, perceptions, and support needs regarding AI

integration in this private higher education institution in Rwanda in particular, and in comparable Rwandan settings more broadly. The dominant body of existing outcome-focused scholarship (Du Plooy et al., 2024; Chen et al., 2026; Kyambade et al., 2025; Msambwa et al., 2025; Troussas et al., 2020) is predominantly quantitative and comparative, capturing statistical relationships between AI use and student outcomes while largely bypassing the voices of the lecturers who must translate policy and technology into daily pedagogical practice. Qualitative work does exist internationally, for example, the opportunities and challenges of AI in higher education but this and related qualitative studies were not conducted within Rwandan private higher education institutions and do not speak directly to the institutional, infrastructural, and policy conditions of this setting. Without qualitative insight grounded in this specific context, institutions risk investing in AI technologies without adequately addressing the human, pedagogical, and infrastructural realities that ultimately determine whether these tools are meaningfully and sustainably integrated. This study was therefore motivated by the need to complement the existing quantitative evidence, and to extend the small but growing Rwanda-focused qualitative and policy literature, with an in-depth, contextualized qualitative case study that centers lecturers' voices within one bounded institutional setting, offering a fuller and more grounded picture to inform policy, training, and institutional support for AI integration in higher education.

2. Objectives of the Study

This study was guided by the following three objectives:

1. To explore lecturers' experiences of integrating artificial intelligence tools into their lecturing practices at a private higher education institution.
2. To examine the challenges and barriers that lecturers encounter when integrating artificial intelligence into their teaching.
3. To identify the strategies and forms of support that lecturers perceive as necessary for effective and sustainable integration of artificial intelligence into lecturing.

3. Literature Review

The application of artificial intelligence in higher education is reshaping teaching and learning globally, with intelligent tutoring systems and adaptive learning platforms increasingly featured in university classrooms (Iqbal et al., 2025; Jafari & Keykha, 2024; Troussas et al., 2020). Proponents argue that these tools allow instruction to be tailored to individual students' needs and pace, using advanced analytics to identify learning gaps and provide timely support (Du Plooy et al., 2024). Beyond academic gains, AI-enabled environments have also been associated with greater interactivity, collaboration, and a stronger sense of learner control, which in turn nurture motivation and engagement (Kyambade et al., 2025; Msambwa et al., 2025).

At the same time, a more cautious strand of literature questions whether AI tools genuinely transform pedagogy or merely digitize existing instructional patterns without altering their underlying limitations (Altamirano et al., 2026). Institutional readiness, faculty preparedness, and students' digital literacy have all been identified as decisive factors shaping whether AI can deliver on its promise (Natarajan et al., 2026). Similarly, Machajewski (2026)

Taken together, this body of literature is largely, though by no means exclusively, quantitative and comparative in design, qualitative accounts such as Natarajan et al. (2026) exist internationally, but remain comparatively rare in this field and it is dominated by a focus on measurable student outcomes such as performance, engagement, and satisfaction scores. Machajewski (2026) is cited here specifically for its account of undergraduate students' feedback-seeking behavior, a pedagogical process relevant to AI-generated feedback, rather than as evidence about the overall balance of quantitative and qualitative

research in this field. Even where teachers' perspectives are acknowledged as important, for instance in Altamirano et al. (2026) study of teachers' attitudes toward AI integration, the qualitative depth needed to understand how lecturers experience, interpret, and adapt to AI integration in their everyday practice, particularly within private higher education institutions in Rwanda, remains scarce. This scarcity is further underscored by Kyambade et al. (2025) finding that governance structures, rather than lecturer experience per se, have so far dominated the small Rwanda-focused literature on generative AI in higher education. This gap is precisely what the present study addresses by adopting a qualitative case study design that centers the lived experiences, challenges, and support needs of lecturers themselves at one private Rwandan institution, thereby complementing and extending the existing quantitative and governance-focused evidence base.

4. Methodology

4.1 Research Design

This study adopted a qualitative case study design (Creswell & Poth, 2025) to gain an in-depth, contextualized understanding of how lecturers experience the integration of artificial intelligence into their lecturing practices at a private higher education institution in Rwanda. The case study design was considered appropriate because it allowed the researchers to examine a real-life, bounded phenomenon, namely AI integration in lecturing, within its natural institutional context, capturing the complexity and nuance that a quantitative, variable-based approach would not readily reveal.

4.2 Operational Definition of "AI Integration" and the Bounded Case

For the purposes of this study, "AI integration in lecturing" is defined operationally as any deliberate use, by a lecturer, of a software tool with generative, adaptive, or automated-feedback capability to support a specific teaching task; including, but not limited to, generating or adapting instructional material, producing automated or semi-automated feedback on student work, or using adaptive or intelligent-tutoring platforms to differentiate instruction. This definition distinguishes AI integration from general institutional digitalization (for example, learning-management systems or video-conferencing tools that do not themselves generate, adapt, or evaluate content) and from student-initiated AI use that a lecturer did not direct or knowingly incorporate into a teaching task.

The case is bounded as the experience of lecturers at one private higher education institution in Rwanda who reported direct, lecturer-initiated attempts to use AI tools of the kind defined above, within a defined data-collection period. At the time of data collection, the institution, e.g., approximate size, whether a formal AI or digital-learning policy existed, and the state of campus internet infrastructure, which forms the immediate governance and infrastructural context within which participants' experiences are interpreted.

4.3 Participants and Sampling

Participants were eligible for inclusion if they (a) held a substantive teaching role at the institution during the data-collection period, and (b) reported having personally attempted to use at least one AI tool meeting the operational definition in their own lecturing, whether successfully or not. Lecturers who had only observed AI use by colleagues or students, without themselves attempting to integrate a tool into their own teaching, were not eligible.

The study population comprised lecturers at the selected private higher education institution who had direct experience attempting to integrate AI tools, such as intelligent tutoring systems, AI-based feedback platforms, or generative AI applications, into their lecturing. Participants were selected purposively

Given the small number of eligible, self-identified AI-using lecturers at a single institution, and the heterogeneity of disciplines and AI tools represented among them, the adequacy of this sample is better

assessed through the information power framework than through a numerical saturation claim: the study's narrow aim, participants' directly relevant experience, and the quality of dialogue achieved in semi-structured interviews together support a reasonably information-rich, if modest, dataset for an exploratory case. Accordingly, this study does not claim that formal thematic or code saturation was assessed, and the four-participant sample is presented as an exploratory, information-rich case rather than a saturated or representative one.

This sample of four (4) lecturers, drawn from different disciplines and with varying years of lecturing experience, therefore constituted the final study sample.

Table 1 presents an anonymized profile of the four participants.

Table 1. Anonymized profile of the four participants

Lecturer code	AI tool(s)/function(s) used
L1	Generative AI applications / classroom examples & simulations
L2	AI-generated/automated feedback tool
L3	Generative AI application (self-taught use)
L4	Automated feedback/marking-support tool

Lecturer codes (L1–L4) are pseudonyms assigned in the order interviews were conducted.

4.4 Data Collection

Data were collected through in-depth, semi-structured interviews, each lasting between 45 and 60 minutes, guided by an interview protocol covering participants' experiences, perceived benefits, challenges, and support needs regarding AI integration. Interviews were conducted in a private setting, audio-recorded with participants' informed consent, and transcribed verbatim.

4.5 Data Analysis

Data were analyzed using the six-step thematic analysis approach of Braun and Clarke (2006), comprising familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final analytic narrative.

4.6 Trustworthiness and Researcher Positionality

Trustworthiness was strengthened through member checking and thick, contextualized description, in line with the criteria of credibility, transferability, dependability, and confirmability proposed by Guba and Lincoln (1982). Both authors are affiliated with the institution in which the study was conducted, which afforded valuable access and contextual understanding but also created a potential power relationship between the researchers and participating colleagues. To mitigate this, participants were assured, both verbally and during the consent process, that their participation and specific responses would not be shared with departmental or institutional leadership, that non-participation would carry no consequence, and, where possible, interviews were conducted by researchers without direct line-management authority over the participant. The authors' own institutional position and familiarity with ongoing AI-adoption debates at the institution are acknowledged as a lens that may have shaped question framing and interpretation; member checking and independent co-coding were used specifically to guard against this. No strongly discrepant or negative cases emerged in relation to the perceived pedagogical value of AI; however, participants varied in how cautious or confident they were about its long-term value, and this variation is reported in the results rather than collapsed into a single "positive" theme.

4.7 Ethical Considerations

Participation was voluntary; informed consent was obtained from all participants after they were informed of the study's purpose, their right to withdraw at any time without penalty, and the intended

use of their data. Beyond participant-level ethics, this study connects to the journal's ethical and societal remit primarily through its bearing on responsible AI governance in higher education: the trial-and-error, largely ungoverned adoption pattern reported by participants raises questions of academic integrity (for example, unclear expectations around AI-assisted feedback or content generation, and institutional accountability). The interview data speak most directly to these governance and equity dimensions; participants were not asked about, and this study therefore cannot report findings on, student data protection, algorithmic bias, or student consent to AI-mediated instruction. These remain important adjacent questions, framed here through relevant literature and policy rather than presented as findings of this study.

5. Results

5.1 Participants' Profile

A full anonymized profile of participants is presented in Table 1. Data collection was stopped at four participants because, by the fourth interview, no new categories or themes were emerging from the data

5.2 Objective One: Lecturers' Experiences of Integrating AI into Lecturing

With respect to the first objective, the data revealed that lecturers' experiences of integrating AI into their lecturing were largely positive, though mixed and evolving through informal trial and error.

Table 2: AI Experiences: Themes and Illustrative Quotations

Category	Theme	Illustrative Quotation
Perceived pedagogical benefits	Personalized feedback and differentiated support	"With AI-generated feedback, I can respond to each student's specific gap almost immediately, something I could never do with a class of eighty." (L2)
Perceived pedagogical benefits	Time efficiency in preparation and marking	"It has cut down my marking time significantly, which I can now reinvest in preparing richer class activities." (L4)
Perceived pedagogical benefits	Enhanced student engagement and participation	"Students seem more alert and curious in sessions where I use AI-based examples or simulations." (L1)
Mixed and evolving experience	Trial-and-error, self-taught adoption	"No one trained me formally; I learned mostly by experimenting on my own and sometimes failing." (L3)
Mixed and evolving experience	Cautious optimism about long-term value	"I am hopeful, but I am still not fully sure I am using these tools the right way." (L2)

"Illustrative quotation" indicates a selected excerpt rather than an exhaustive record of the theme; for the interview language and quotation-editing procedure, and Table 1 for lecturer-code definitions. Across the four lecturers, the pedagogical-benefit theme was not uniform. L2 and L4 described concrete efficiency gains tied to specific tasks, formative feedback and assignment marking, respectively, whereas L1's account centered on engagement during class activities rather than feedback efficiency, suggesting that perceived benefit may track the specific task a lecturer applies AI to, rather than reflecting one generic "AI benefit." L3's account, by contrast, emphasized the effortful, error-prone process of learning to use these tools at all, indicating that perceived benefit and perceived difficulty coexisted within this small sample rather than describing two separate groups of "adopters" and "strugglers." Overall, lecturers described AI as a resource that enhanced the responsiveness and efficiency of their teaching, particularly regarding feedback and preparation time, while also acknowledging that their use of these tools remained exploratory rather than systematically guided.

5.3 Objective Two: Challenges and Barriers to AI Integration

Regarding the second objective, participants identified several interrelated barriers that constrained their ability to integrate AI meaningfully into lecturing, organized into three broad categories.

Table 3: AI Challenges: Themes and Illustrative Quotations

Category	Theme	Illustrative Quotation
Infrastructural barriers	Unreliable internet connectivity	"The connection sometimes fails right in the middle of a lesson, and that discourages me from planning around it." (L1)
Infrastructural barriers	Limited access to devices and licensed tools	"Not every student has a laptop, so I cannot always assume everyone can follow the AI-based activity." (L3)
Competency-related barriers	Inadequate formal training	"I have never attended a proper workshop on how to use these tools pedagogically." (L4)
Competency-related barriers	Low confidence in troubleshooting technical issues	"When something goes wrong technically, I often do not know how to fix it on the spot." (L2)
Institutional barriers	Absence of clear institutional policy	"There is no written guideline telling us how AI should or should not be used in our courses." (L1)
Institutional barriers	Lack of incentives or recognition	"Those of us who put in the extra effort to use AI do not receive any particular recognition for it." (L3)

These barriers were not evenly distributed across participants: infrastructural concerns were raised primarily by L1 and L3, whose teaching involved more device-dependent classroom activities, whereas L2 and L4 emphasized competency-related barriers more strongly. This suggests that the barrier a given lecturer foregrounds may relate to how they were already attempting to use AI, rather than indicating one uniform, institution-wide barrier profile. These findings indicate that barriers to AI integration were not solely technological but were compounded by gaps in training, institutional guidance, and recognition structures.

5.4 Objective Three: Strategies and Support Needed for Effective Integration

On the third objective, lecturers articulated specific forms of support they considered necessary to sustain and improve AI integration into lecturing.

Table 4: AI Strategies: Themes and Illustrative Quotations

Category	Theme	Illustrative Quotation
Capacity building	Continuous, hands-on professional development	"We need regular, practical training, not a one-off seminar that we then forget." (L2)
Capacity building	Peer mentoring and collaborative learning	"Learning from a colleague who has already tried a tool successfully would help me a lot." (L4)
Institutional support	Clear institutional policy and guidelines	"We need an official policy so that all lecturers use AI in a coherent, agreed-upon way." (L1)
Institutional support	Dedicated budget and resource allocation	"The institution should set aside a specific budget for AI tools and licenses for staff." (L3)
Technical support	Reliable infrastructure and connectivity	"Fixing the internet reliability issue would immediately make AI use more consistent for all of us." (L2)
Technical support	Accessible IT helpdesk support	"Having someone to call immediately when a tool fails during class would reduce a lot of anxiety." (L4)

Institutional-support and capacity-building strategies were raised across all four participants, whereas the specific emphasis on incentives and recognition was voiced primarily by L3. This particular recommendation is therefore better understood as one lecturer's proposition than as a broadly shared

demand, and it is presented with that qualification. These results collectively suggest that sustainable AI integration, in the view of lecturers, depends on a combination of ongoing capacity building, formal institutional policy and investment, and dependable technical infrastructure.

6. Discussion

The finding that lecturers perceived AI as valuable for personalizing feedback and enhancing student engagement resonates strongly with the existing quantitative literature, which has documented statistically significant improvements in academic performance, interaction, and satisfaction among students exposed to AI-integrated teaching (Du Plooy et al., 2024; Msambwa et al., 2025). However, whereas the quantitative literature demonstrates that these benefits occur, the present study's qualitative data illuminate

The theme of trial-and-error, self-taught adoption identified in this study extends the observations of Altamirano et al. (2026), who cautioned that AI tools risk being reduced to superficial technological add-ons rather than genuine pedagogical transformations when institutions fail to guide their implementation deliberately. The present findings substantiate this concern empirically by showing that, in the absence of structured training, lecturers in this private institution

The infrastructural barriers identified, particularly unreliable internet connectivity and limited student access to devices, align with the broader concerns raised by Natarajan et al. (2026), regarding institutional readiness and digital literacy as preconditions for effective AI adoption. What this study adds, however, is a grounded, first-person account of how such infrastructural limitations are experienced daily by lecturers attempting to plan lessons around unpredictable technology, a level of practical, situated detail that quantitative, survey-based methodologies are not well positioned to capture.

Similarly, the competency-related barriers reported by participants, including inadequate formal training and low confidence in troubleshooting, corroborate Machajewski. The institutional barriers identified, notably the absence of clear policy and lack of recognition for lecturers' efforts, extend the discussion of Iqbal et al. (2025), regarding teachers' perspectives on AI integration. While their study gestured toward the importance of institutional context, the present case study demonstrates concretely how the absence of policy. Finally, the support strategies identified by lecturers, including continuous professional development, peer mentoring, institutional policy, and reliable technical support, correspond closely with Chen et al (2026).

7. Limitations

This study has several limitations that should be considered when interpreting its findings. First, it is based on a single private higher education institution in Rwanda and a small, purposively selected sample of four self-selected AI-using lecturers; lecturers who had not attempted to use AI, and lecturers at other institutions, are not represented, so the findings should not be read as representative of private higher education in Rwanda more broadly. Second, the data are entirely self-reported: participants' accounts of perceived benefit and barrier were not triangulated with classroom observation, documentary evidence (such as institutional policy documents or usage logs), or independent measures of student learning, so claims in this article are properly understood as lecturers' perceptions rather than demonstrated educational effects. Third, both authors' institutional affiliation with the study site, while enabling valuable access, may have shaped participants' willingness to disclose certain views, notwithstanding the safeguards described in Section 4.6. Fourth, this study does not claim formal thematic or code saturation; a larger or multi-institutional sample might surface themes not captured here. Finally, AI tools and institutional practice in this domain are changing rapidly, and the account offered here reflects lecturers' experience during the specific data-collection period; readers should treat the findings as a time-bound snapshot rather than a stable characterization of AI integration at the institution.

8. Conclusion

This qualitative case study set out to explore lecturers' experiences, challenges, and support needs regarding the integration of artificial intelligence into lecturing

9. Recommendations

Based on these findings;

1. Private higher education institutions should develop and formally communicate a clear institutional policy on AI integration in lecturing, specifying expectations, acceptable tools, and quality standards for its pedagogical use.
2. Institutions should invest in continuous, hands-on professional development programs and structured peer-mentoring schemes so that lecturers can move from self-taught, trial-and-error use of AI toward confident, pedagogically grounded practice.
3. Institutions should prioritize investment in reliable technical infrastructure, including stable internet connectivity and accessible IT support, to remove practical obstacles that currently discourage consistent AI use in lecturing.
4. Institutional leaders should consider mechanisms for recognizing and incentivizing lecturers who invest additional effort in integrating AI into their teaching, so as to sustain motivation and encourage broader adoption
5. Future research should extend this case study through multi-institutional qualitative or mixed-methods studies

Declarations

AUTHOR CONTRIBUTIONS	Onesme Niyibizi: Conceptualization, methodology, investigation, data collection, data analysis, writing original draft, review, and editing. Mediatrice Umutoni: Methodology, investigation, data collection, data analysis, writing, review, and editing. Both authors read and approved the final version of the manuscript.
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ETHICS	Participants were informed about the purpose of the study, their participation was voluntary, and confidentiality and anonymity were maintained. Informed consent was obtained from the participants before data collection.
DATA AVAILABILITY	The data supporting the findings of this study are available from the corresponding author upon reasonable request.
USE OF GENERATIVE AI	The authors declare that generative artificial intelligence tools were not used to generate, analyse, or interpret the research data or findings, and the authors take full responsibility for the content of the final manuscript.
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