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Responsible integration of generative AI in university English language learning

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This study examines the responsible integration of generative artificial intelligence (GenAI) in English language learning at Mattu University, focusing on opportunities, challenges, and ethical considerations. A mixed-methods design was employed, combining quantitative data from questionnaires completed by 124 first-year students with qualitative insights obtained from interviews with six English instructors and classroom observations. Findings reveal that students perceive GenAI as beneficial for idea generation, vocabulary development, grammatical accuracy, and learning engagement. However, concerns emerged regarding overreliance on AI-generated content, potential reductions in creativity, uneven access to digital infrastructure, and limited understanding of ethical use. Instructors acknowledged the pedagogical value of GenAI for streamlining lesson preparation and supporting differentiated instruction, yet emphasized the need for professional development to ensure effective and ethical implementation. Integrated analysis indicates that responsible GenAI use requires a coordinated approach that combines pedagogical scaffolding, AI literacy training, equitable access to technological resources, and clear institutional guidelines. The study concludes by offering practical recommendations for educators and administrators seeking to harness GenAI are potential while mitigating associated risks in higher-education English language programs.

Key Words: artificial intelligence; ethical integration; English language learning; higher education; pedagogy.

1. Introduction

The rapid development of generative artificial intelligence (GenAI), particularly large language models (LLMs), has begun to reshape teaching and learning practices in higher education worldwide. In language-learning contexts, GenAI-enabled tools such as ChatGPT, Grammarly, and other text generators increasingly assist learners in producing written texts, clarify grammatical structures, help expand vocabulary, and provide immediate feedback. As institutions explore AI-assisted learning, the question of how to adopt these tools responsibly, maximizing educational benefits while minimizing risks, has become a pressing global concern.

Existing research highlights some potential pedagogical advantages of GenAI, including personalized learning support, enhanced learner autonomy, and improved engagement in reading and writing tasks (Al Hafizh et al., 2025). However, scholars also emphasize challenges such as factual inaccuracies, ethical risks, academic integrity concerns, and potential overreliance that may

weaken independent critical thinking (Cotton et al., 2024). In addition, effective integration depends heavily on teacher readiness and institutional capacity, including technological infrastructure and professional training (Zhai, 2023).

Although existing studies provide valuable insights, most have been conducted in technologically advanced or well-resourced educational settings. As a result, their findings may not fully capture the realities of developing countries. The Ethiopian higher education context, for example, presents distinct characteristics that can shape the adoption and impact of GenAI. Many first-year students enter university with limited prior exposure to digital learning tools and AI-supported environments, which may influence how they interpret AI-generated content, the extent to which they critically evaluate outputs, and their susceptibility to overreliance on such tools. In addition, infrastructural constraints such as inconsistent internet connectivity and unequal access to digital devices can significantly affect both patterns of engagement and learning outcomes. While this study is situated in Ethiopia, these contextual challenges are not unique. Similar conditions are evident across many developing countries, as well as among disadvantaged student populations in more developed contexts (e.g., low socioeconomic status or rural backgrounds). Therefore, this case study offers insights that extend beyond its immediate setting by highlighting how structural inequalities, limited digital literacy, and resource constraints mediate GenAI use in education. In doing so, it contributes to a broader understanding of how GenAI tools may function in under-resourced environments and provides implications relevant to educators, policymakers, and researchers working in comparable contexts worldwide.

By examining GenAI use among first-year students and English instructors at Mattu University, this study contributes empirical evidence from a sub-Saharan African higher education context, where research remains limited. Using mixed-methods data, the study explores perceived opportunities, challenges, and ethical considerations surrounding GenAI integration in university English instruction. In doing so, the study not only documents local experiences but also extends international discussions by demonstrating how contextual conditions, particularly levels of digital literacy and institutional readiness, mediate AI adoption in language education.

The following research questions guided the study:

1. What educational opportunities of generative AI for English language learning are identified in the literature, and how are these opportunities perceived and experienced by students and instructors at Mattu University?
2. What challenges, risks, and ethical concerns associated with generative AI integration are discussed in existing scholarship, and how do these manifest in the context of university English language education at Mattu University?

Through addressing these questions, the study emphasizes the need for a responsible, pedagogically informed, and ethically grounded approach to GenAI implementation. While GenAI holds promise for enhancing university English instruction, its impact ultimately depends on informed guidance, adequate training, institutional support, and contextual sensitivity.

2. Theoretical frameworks

What is likely to be needed for the effective integration of generative artificial intelligence in English language learning can be understood through several interrelated theoretical perspectives as discussed below. These frameworks illuminate how learners interact with GenAI tools, how teachers scaffold these interactions, and how institutional structures shape responsible and equitable use. The present study draws on sociocultural theory, cognitive load theory, and digital literacy frameworks as discussed in this section to interpret participants' experiences and guide the analysis of opportunities and challenges associated with AI-supported pedagogy.

2.1. Sociocultural theory and mediated learning

Sociocultural theory, grounded in the work of Vygotsky (1978), emphasizes that learning occurs through mediated interaction within social and cultural contexts. Central to this perspective is the concept of the Zone of Proximal Development (ZPD), which describes the gap between what learners can accomplish independently and what they can achieve with guidance. Within this framework, tools both physical and digital serve as mediational artifacts that extend learners' cognitive capabilities. In GenAI-supported learning, systems such as ChatGPT function as mediational tools that scaffold engagement with complex linguistic tasks by providing explanations, models of writing, and immediate feedback. When integrated under instructor guidance, AI tools can complement teacher mediation by enabling students to practice skills independently while receiving iterative support (Holmes et al., 2019; Kasneci et al., 2023; UNESCO, 2023).

However, sociocultural theory also highlights potential risks with GenAI-supported learning. Learning depends not only on external assistance but also on the internalization of knowledge through active engagement. Overreliance on technological tools may limit this internalization process if external mediation replaces learners' cognitive effort. Recent discussions in AI-in-education research similarly caution that unstructured or excessive use of generative systems may reduce critical thinking and independent problem-solving (e.g. Kasneci et al., 2023). Therefore, this theoretical framework underscores the importance of positioning GenAI as a scaffold within the ZPD rather than as a substitute for meaningful language practice and creative production, ensuring that mediated support promotes rather than diminishes learner development.

2.2. Cognitive load theory

Scholars and educators have raised concerns that the use of generative AI may encourage cognitive offloading, whereby learners delegate substantial portions of academic tasks to AI systems rather than engaging deeply with the material (e.g., Kasneci et al., 2023). The concept of cognitive offloading itself was originally discussed by Risko and Gilbert (2016), who described how individuals rely on external tools to reduce cognitive effort. From a cognitive load perspective, such delegation may limit germane cognitive load, which is essential for schema development, critical thinking, and long-term skill acquisition (Sweller, 1988; Sweller et al., 2011). Recent studies on AI-assisted learning similarly warn that overreliance on generative systems may encourage cognitive offloading and reduce active engagement in critical thinking and writing development (Kasneci et al., 2023; Mollick, 2024). The findings of this study therefore align with prior research emphasizing that GenAI should be integrated through structured pedagogical guidance to ensure that cognitive effort remains directed toward meaningful learning and deeper understanding (Kasneci et al., 2023; Mollick, 2024).

Nevertheless, there remains limited research examining these dynamics in under-resourced higher education contexts, particularly in settings where students have varying levels of digital literacy and access. Therefore, while theory and existing studies suggest both potential benefits and risks, further empirical investigation is needed to understand how GenAI shapes cognitive engagement in specific contexts such as Ethiopian higher education.

2.3. Digital literacy and AI literacy frameworks

Digital literacy frameworks emphasize the skills needed to critically analyze, evaluate, and ethically use digital technologies (Buckingham, 2015). With the emergence of GenAI, scholars have extended this concept to include AI literacy, which is the ability to understand AI's capabilities, limitations, ethical implications, and potential for bias (Long & Magerko, 2020). For university learners, AI literacy includes verifying AI-generated content, identifying inaccuracies, avoiding plagiarism, and using GenAI tools in ways that promote rather than substitute learning.

This framework is particularly relevant in contexts where students may adopt AI tools without prior training or awareness of academic integrity standards. In such settings, students may be more likely to rely on GenAI in ways that bypass critical engagement, especially in the absence

of clear pedagogical guidance (Kasneci et al., 2023; Cotton et al., 2024). Instructors' AI literacy is therefore equally critical as teacher preparedness has been shown to shape how emerging technologies are integrated into learning activities and whether they promote higher-order thinking or inadvertently encourage dependency (Ertmer & Ottenbreit-Leftwich, 2010; Tondeur et al., 2017). Recent research highlights that academics' understanding of GenAI significantly influences their expectations of student writing, their assessment practices, and the extent to which they view AI as a support or a threat to learning. From a theoretical perspective, this finding aligns with broader work on digital and AI literacy, which emphasizes that effective use of technological tools depends not only on access but also on users' critical, ethical, and pedagogical understanding (Ng, 2012; Long & Magerko, 2020; UNESCO, 2021). Consequently, integrating AI literacy into curriculum design and teacher development can be seen as a key condition for responsible GenAI implementation. However, empirical research on how instructor AI literacy shapes student learning outcomes, particularly in under-resourced higher education contexts, remains limited (Zawacki-Richter et al., 2019), underscoring the need for further investigation.

2.4. A conceptual model for responsible GenAI use

Bringing the above perspectives together, this study adopts a conceptual framework for responsible GenAI integration that synthesizes insights from sociocultural theory, cognitive learning principles, and existing work on AI in education. Rather than proposing an entirely new model, the framework draws on and adapts prior approaches to human-centered AI integration (e.g., Holmes et al., 2019; UNESCO, 2023) and technology integration frameworks such as the TPACK framework (Mishra & Koehler, 2006).

In this study, the framework presented below serves two main purposes. First, it informs the design of the research instruments by guiding the development of survey and interview questions related to pedagogical practices, cognitive engagement, ethical awareness, and institutional conditions. Second, it provides an analytical lens for interpreting the findings, enabling a structured examination of how GenAI is currently understood and used within the context of Mattu University.

The framework is organized around four interrelated pillars:

1. **Pedagogical Mediation (CM1)**: Consistent with sociocultural perspectives (Vygotsky, 1978), AI tools are examined in relation to instructor-guided learning processes, particularly the extent to which they function as scaffolds rather than autonomous substitutes.
2. **Cognitive Balance (CM2)**: Drawing on cognitive learning theories, the study explores whether GenAI use appears to reduce extraneous cognitive load while maintaining opportunities for critical engagement and independent language production.
3. **Ethical and AI Literacy (CM3)**: In line with international policy frameworks (UNESCO, 2023), this dimension focuses on students' and instructors' awareness of academic integrity, responsible use, and critical evaluation of AI-generated content.
4. **Institutional Support (CM4)**: Reflecting broader higher education technology integration literature, this pillar considers infrastructural access, training opportunities, and policy guidance as enabling or constraining factors.

While these dimensions are grounded in established theory and prior research, they are also used in this study as sensitizing concepts rather than fixed evaluative criteria. This allows the analysis to remain open to context-specific insights emerging from the data. In this sense, the framework not only structures the investigation but is also refined through the empirical findings, contributing a contextually grounded perspective on responsible GenAI use in Ethiopian Universities.

3. Methods

This study employed a mixed-methods research design to investigate the opportunities, challenges, and ethical considerations associated with the use of GenAI in English language learning at Mattu University. The combination of quantitative and qualitative approaches enabled a comprehensive analysis of students' and instructors' perceptions while allowing for triangulation across multiple data sources. The following subsections outline the research design, setting and participants, sampling procedures, data sources, data collection process, data analysis, and ethical considerations.

3.1. Research design

A convergent mixed-methods design was adopted to integrate the breadth of quantitative findings with the depth of qualitative insights (Johnson & Onwuegbuzie, 2004). Quantitative data were collected through structured questionnaires administered to first-year university students, while qualitative data were obtained through semi-structured interviews with English instructors and classroom observations. Both strands were analysed separately and subsequently merged to generate a holistic understanding of how GenAI is perceived, used, and understood within English language classrooms. Integration of the two data strands was guided by the study's conceptual framework for responsible GenAI use. Specifically, the four pillars of the framework pedagogical mediation, cognitive balance, ethical and AI literacy, and institutional support were used as common analytical dimensions across both datasets. Questionnaire items were designed to capture students' experiences in relation to these dimensions, while interview protocols and observation guides were structured to explore how instructors interpret and enact them in practice. During analysis, quantitative results and qualitative findings were compared and synthesized within each pillar of the framework. This approach enabled convergence (where findings aligned), complementarity (where qualitative data elaborated on quantitative trends), and divergence (where inconsistencies revealed context-specific complexities). In this way, the framework functioned not only as a theoretical lens but also as an integrative tool, linking data collection and interpretation across methods. The mixed-methods design was therefore selected not only to combine numerical trends with contextual depth, but also to support a theory-informed analysis that reflects the interaction between pedagogical, cognitive, ethical, and institutional factors in shaping GenAI use.

3.2. Setting and participants

The study was conducted at Mattu University, Ethiopia, within the College of Social Sciences and Humanities. The institution enrols a diverse student population and offers foundational English courses that introduce academic reading, writing, speaking, and study skills. These courses are taught in large classes where learners often possess varied linguistic abilities and limited prior exposure to digital learning tools. A total of 124 first-year students from the Social Sciences and Humanities streams participated in the quantitative phase of the study. Students were drawn from three sections (2, 3, and 4) enrolled in Communicative English Skills I. Their backgrounds reflect a range of English proficiency levels and digital literacy experiences. The qualitative phase included six English language instructors who teach first-year English courses. These instructors were selected due to their direct engagement with student learning and their familiarity with emerging patterns of GenAI use in coursework. Including instructors alongside learners enabled a multi-layered perspective on the pedagogical and ethical implications of GenAI adoption, while also allowing the study to explore the full range of dimensions outlined in the conceptual framework. In particular, instructors were well positioned to provide insights into pedagogical mediation (how GenAI is incorporated into teaching practices), cognitive balance (how AI use shapes student engagement and learning processes), ethical and AI literacy (issues of academic integrity and responsible use), and institutional support (availability of guidance, training, and infrastructure). Their perspectives therefore complemented student responses and supported a more comprehensive examination of how these interconnected elements operate in practice.

3.3. Sampling procedures

A two-stage sampling strategy was employed. For the quantitative component, simple random sampling was used to select student participants. Official class lists were obtained from the registrar's office, and a random-number generator selected students to ensure proportional representation and minimize sampling bias. For the qualitative component, criterion-based sampling was used to recruit instructors. Eligibility criteria included: (a) active teaching of first-year Communicative English Skills I, (b) familiarity with students' early use of GenAI tools, and (c) willingness to participate. This purposive selection ensured that participants possessed relevant knowledge and experience regarding the role of AI in university English instruction.

3.4. Data collection tools and procedures

To address the research questions, the study employed multiple data collection tools to ensure comprehensive insights and strengthen trustworthiness through triangulation.

3.4.1. Structured questionnaires

Students completed a structured questionnaire designed to assess their perceptions of generative AI (GenAI), including perceived benefits, challenges, ethical concerns, and readiness for AI-supported learning. The instrument consisted of items measured using a five-point Likert scale and was explicitly aligned with key dimensions of the study's conceptual framework, particularly pedagogical mediation (CM1), cognitive balance (CM2), and ethical and AI literacy (CM3). Items examined how students experienced instructor-guided use of GenAI in learning activities, the extent to which AI tools supported or shaped their cognitive engagement and independent language production, and their awareness of responsible use, academic integrity, and critical evaluation of AI-generated content. The questionnaires were administered towards the end of the teaching semester, after students had sufficient exposure to GenAI tools within their coursework, ensuring that responses were grounded in actual experience rather than initial impressions. They were distributed during regular class sessions and completed individually under researcher supervision to minimize peer influence and support independent responses.

3.4.2. Semi-structured interviews

Instructor perspectives were gathered through semi-structured interviews focusing on experiences with GenAI in lesson planning, student assignments, ethical considerations, and professional development needs. Interviews were conducted in quiet university offices, lasting 25–40 minutes each. A semi-structured guide ensured consistency while allowing follow-up questions. All sessions were audio-recorded with participant consent and later transcribed for analysis.

3.4.3. Classroom observations

Classroom observations were conducted to document the presence, frequency, and purpose of GenAI use during instruction. Two lessons per instructor were observed using a structured checklist that was explicitly aligned with the study's conceptual framework, capturing dimensions of pedagogical mediation (CM1), cognitive balance (CM2), ethical and AI literacy (CM3), and, where observable, aspects of institutional support (CM4). The checklist focused on how instructors integrated GenAI into teaching activities, the extent to which tasks encouraged active student engagement versus passive reliance, and whether guidance was provided on responsible and ethical use. In addition, attention was given to how classroom practices reflected broader institutional conditions, such as access to technology and instructional support. Detailed field notes complemented the checklist data, enabling a richer, context-sensitive interpretation of how these interconnected elements were enacted in practice.

3.5. Data analysis

Quantitative data were entered into spreadsheet software and analysed using descriptive statistics, including frequencies and percentages. These analyses provided insights into student perceptions

regarding GenAI's perceived benefits, challenges, and the level of support needed for effective use. The resulting patterns were subsequently interpreted in relation to the study's conceptual framework, particularly in terms of pedagogical mediation (CM1), cognitive balance (CM2), and ethical and AI literacy (CM3). Interview transcripts and observation notes were analysed using thematic analysis. In the first stage, codes were generated inductively by identifying recurring patterns in participants' descriptions, allowing themes to emerge directly from the data without being constrained by the conceptual model. These initial codes were then organized into broader themes such as instructional efficiency, student dependency, ethical concerns, and infrastructure constraints. In the second stage, these themes were compared with and mapped onto the four dimensions of the conceptual framework pedagogical mediation (CM1), cognitive balance (CM2), ethical and AI literacy (CM3), and institutional support (CM4). This two-step approach enabled the analysis to remain grounded in participants' perspectives while also facilitating a theory-informed interpretation of how the findings aligned with, extended, or challenged the proposed model.

3.6. Integration of findings

After analysing each dataset separately, the results were integrated to compare and contrast insights across student and instructor perspectives. This triangulation enhanced the credibility of the findings and provided a comprehensive interpretation of GenAI's role in English language learning at Mattu University.

3.7. Ethical considerations

All procedures complied with established ethical guidelines for research involving human participants. Participants received clear explanations of the study's purpose, and informed consent was obtained prior to data collection. No identifying information was included in the questionnaire or interview transcripts. The study adhered to principles of confidentiality, voluntary participation, and respect for participant autonomy.

4. Results

The results of this study are organized into three major parts: (a) quantitative results from student questionnaires, (b) qualitative findings from instructor interviews and classroom observations, and (c) integrated findings synthesizing insights across data sources. These results illuminate the opportunities, challenges, and practical implications of using GenAI in English language learning at Mattu University. While the findings are grounded in a single institutional context, they are analytically relevant beyond this setting. They contribute to a broader understanding of how generative AI is experienced in higher education contexts where students may have limited prior exposure to AI-supported learning, uneven digital literacy, and infrastructural constraints. As such, the study offers insights that may be transferable to similar educational environments in other developing contexts, particularly regarding how pedagogical practices, cognitive engagement, ethical awareness, and institutional conditions interact to shape GenAI adoption in language learning.

4.1. Quantitative Findings

4.1.1. Students' Perceived Benefits of GenAI

The data in Table 1 indicate that students perceive GenAI as a highly useful tool for supporting English language learning, particularly in the early stages of writing. A large majority of respondents (93%) agreed or strongly agreed that AI tools assist with idea generation for writing tasks. This suggests that GenAI may function as a form of initial cognitive scaffold, helping learners overcome difficulties such as writer's block and supporting the organization of ideas. Similarly, 72–75% of students reported that GenAI supports vocabulary development and grammatical accuracy, indicating that learners primarily experience these tools as aids for surface-level linguistic

refinement. In addition, approximately 80% of students reported increased engagement when using GenAI, suggesting motivational benefits in addition to perceived cognitive support.

However, within the framework of cognitive balance (CM2) in the study's conceptual model, these findings should be interpreted cautiously. While GenAI appears to reduce extraneous cognitive load by assisting with idea generation and language formulation, the data do not directly demonstrate whether learners are engaging in deeper processing or developing independent writing competence. In other words, the results reflect perceived facilitation of learning tasks rather than evidence of schema construction or long-term skill development.

The small proportion of neutral or negative responses may further suggest variability in how students regulate their use of GenAI, potentially reflecting differences in digital literacy and critical engagement. This variability is important from a cognitive balance perspective as it raises the possibility that some learners may benefit from scaffolding, while others may risk over-reliance and reduced independent cognitive effort. Overall, the findings suggest that students view GenAI primarily as a supportive tool within teacher-led instruction rather than a replacement for learning processes. However, consistent with element (CM2) of the conceptual framework, the educational value of GenAI depends not only on its ability to support task completion, but on whether it preserves sufficient cognitive engagement to foster meaningful learning.

Table 1. Students' perceived benefits of GenAI in English learning.

Benefit	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
GenAI helps generate ideas for writing	68	25	5	2	0
GenAI supports vocabulary growth	45	27	18	8	2
GenAI enhances grammar and sentence structure	40	35	15	8	2
GenAI increases learning engagement	50	30	12	6	2

4.1.2. Challenges and risks of GenAI use

Students also expressed several challenges and concerns regarding the use of GenAI. Sixty percent agreed that excessive reliance on AI could diminish critical thinking and independent problem-solving. This reflects broader concerns in educational technology literature that AI-based scaffolding may, if not carefully mediated, reduce learners' active cognitive engagement (Risko & Gilbert, 2016; Kasneci et al., 2023; Selwyn, 2019). Additionally, 55% of students reported that AI occasionally provides inaccurate or misleading feedback. Such limitations highlight the need for critical evaluation of AI-generated outputs and reinforce the importance of instructor oversight in validating information and guiding appropriate use (Bender et al., 2021; OpenAI, 2023). Ethical concerns were reported by over half of the participants, particularly in relation to plagiarism, responsible prompting, and appropriate attribution of AI-generated content (Cotton et al., 2024; UNESCO, 2021; Zawacki-Richter et al., 2019). These findings indicate gaps in students' awareness and practice of academic integrity in AI-supported learning contexts. Furthermore, 60% of respondents identified infrastructural constraints, including intermittent internet connectivity and limited device access, as barriers to consistent engagement with GenAI tools. Taken together, these results suggest that while students recognize the potential benefits of GenAI, they are also aware of its cognitive, ethical, and structural limitations. Consistent with the conceptual model, these findings relate primarily to pedagogical mediation (CM1), cognitive balance (CM2), ethical

and AI literacy (CM3), and institutional support (CM4) that is, the four core dimensions of the conceptual model which jointly shape the conditions under which GenAI can be used effectively and responsibly in the learning process.

Table 2. Students' perceived challenges in using GenAI.

Challenge	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Overreliance on GenAI reduces critical thinking	30	30	20	15	5
GenAI sometimes provides inaccurate feedback	25	30	20	20	5
Ethical concerns related to GenAI use	20	35	25	15	5
Limited internet access affects GenAI usage	35	25	20	15	5

4.1.3. Student preparedness and need for support

The findings in Table 3 provide insight into students' self-perceived readiness and support needs. While 75% of students reported confidence in operating AI tools independently, this confidence does not fully reflect pedagogical competence. Notably, 65% of respondents emphasized the importance of instructor guidance on how to use GenAI effectively. This distinction suggests that students differentiate between technical ability, such as navigating an AI interface, and strategic competence, including understanding how to critically evaluate AI outputs and integrate them into their learning. Ethical understanding was moderate, with only 55% expressing confidence in responsible AI use, revealing a critical gap in students' knowledge regarding plagiarism, citation practices, and ethical engagement with AI-generated content. Finally, the majority of students (80%) expressed a desire for additional training, indicating openness to adopting AI as a learning tool, provided that structured support and clear guidance are available. Overall, these results highlight the dual necessity of fostering both technical proficiency and ethical literacy to maximize the benefits of GenAI in language education.

Table 3. Students' preparedness and need for support.

Item	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
I feel confident using AI independently	35	40	15	8	2
I need guidance from instructors to use AI effectively	50	15	20	10	5
I understand the ethical use of GenAI	25	30	25	15	5
Additional training on GenAI would improve my learning	55	25	10	5	5

4.2. Qualitative findings

4.2.1. Instructors' perspectives on GenAI integration

All six instructors interviewed acknowledged the potential of GenAI to improve instructional efficiency. They emphasized that AI applications facilitate rapid creation of teaching materials, including reading passages, vocabulary exercises, and writing prompts tailored to varying proficiency levels. This capability allows instructors to devote more time to interactive and personalized teaching, such as providing targeted feedback or leading small-group discussions. Despite recognizing these advantages, instructors uniformly expressed concerns regarding student overreliance on AI-generated content. Several noted that some students submit work that closely resembles AI output, limiting engagement with higher-order cognitive processes and reducing the exercise of creativity. The majority of instructors (5 out of 6) highlighted a pressing need for professional development in AI integration, indicating that pedagogical strategies and ethical guidelines are currently insufficient. Finally, infrastructural challenges, including unstable internet connectivity and limited device availability, were identified as significant barriers to equitable AI use, underscoring the importance of institutional support and strategic investment in digital learning resources.

Table 4. Instructors' perspectives on GenAI integration.

Theme	Frequency of Mention	Illustrative Description
Improved instructional efficiency	6/6	GenAI helps streamline lesson preparation and provide differentiated tasks efficiently.
Concerns about overreliance and reduced creativity	6/6	Some students rely on AI-generated content without deeper analysis.
Need for professional development	5/6	Instructors require training on effective integration of AI in English courses.
Equity and access challenges	4/6	Limited internet access and devices hinder equal use of AI tools.

4.2.2. Results from classroom observations

Classroom observations confirmed and extended the interview findings. Observations revealed that students often attempted to use GenAI tools independently outside class but relied on instructor mediation during in-class tasks. Instructors frequently prompted students to critically analyse GenAI-generated responses, encouraging reflection and revision. However, the observations revealed disparities in engagement caused by digital inequities, as students without reliable access to devices or the internet could not fully participate in AI-supported activities. These observations suggest that while GenAI has the potential to enhance engagement and individualized learning, its effectiveness is contingent on structured support and equitable access.

4.3. Integrated findings

The integrated analysis (Table 5) reveals a consistent pattern: both students and instructors recognize substantial academic benefits from GenAI, including enhanced idea generation, vocabulary development, grammar improvement, and engagement with course content. Instructors corroborated students' experiences by acknowledging that AI tools streamline lesson preparation and allow for the rapid creation of differentiated materials. Nevertheless, the findings also highlight significant challenges. Concerns regarding overreliance, reduced creativity, and ethical uncertainty were echoed across both groups. Technological constraints, such as intermittent internet access and limited device availability, further complicate AI integration, particularly in resource-limited contexts. These findings underscore the importance of embedding AI use within a coher-

ent pedagogical framework, supported by professional development, institutional policies, and equitable infrastructure, to ensure responsible and effective integration in university English language programs.

Table 5. Integrated summary of opportunities and challenges of GenAI use in English learning.

Dimension	Opportunities	Challenges / Risks
Learning outcomes	Enhanced idea generation, vocabulary expansion, and improved grammar	Possible reduction in creativity and independent thinking
Engagement	Greater motivation, active participation, and interactive learning experiences	Risk of distraction and habitual dependence on AI tools
Instructor role	Streamlined lesson planning and quick creation of tailored materials	Need for enhanced AI literacy, pedagogical adaptation, and ongoing professional development
Access & equity	Personalized learning opportunities	Limited device availability and unreliable internet connectivity
Ethics & academic integrity	Potential for guided practice and formative feedback	Risk of plagiarism, biased outputs, and unclear ethical boundaries

5. Discussion

The discussion interprets the findings in relation to the research questions, theoretical foundations, and existing literature, while highlighting the study's contribution to the broader understanding of GenAI in higher education contexts.

5.1. General findings

The study demonstrates that GenAI significantly supports students' cognitive processes, particularly in writing, vocabulary development, and grammar improvement. The high percentage of students (93%) reporting that AI tools facilitate idea generation suggests that GenAI functions as a cognitive scaffold that reduces initial writing barriers and promotes structured thinking. This finding extends prior research conducted in more technologically advanced contexts (e.g. Kasneci et al., 2023; Mollick, 2024) by showing that similar scaffolding effects are observable in an Ethiopian university setting. Grounded in Vygotsky's (1978) Zone of Proximal Development, GenAI appears to operate as a digital scaffold that bridges gaps between learners' independent abilities and their potential development. By providing linguistic models, vocabulary alternatives, and structural guidance, GenAI supports learners in engaging more effectively with complex academic tasks (Liang et al., 2023). However, it needs to be acknowledged that the research relies on students' perceptions rather than objective measures, which may introduce subjective bias in the reporting of the phenomena under investigation.

Importantly, this study contributes empirical evidence from a developing country higher education context, where research on GenAI integration remains limited. While previous studies have emphasized the pedagogical potential of AI in well-resourced environments, the present findings demonstrate that similar cognitive benefits can emerge when AI is integrated with appropriate instructional guidance, even in resource-constrained settings. Thus, the study adds contextual diversity to the growing international literature on AI-enhanced language learning.

Instructors' interviews further indicated that GenAI enables teachers to concentrate on higher-order pedagogical tasks, such as providing detailed feedback, facilitating discussion, and encouraging critical reflection, rather than lower-order tasks. This finding aligns with research suggest-

ing that technology-supported scaffolding enhances learning outcomes when combined with teacher mediation (Li & Ni, 2021). The findings therefore reinforce the argument that GenAI should be conceptualized not as a replacement for instructors, but as a complementary educational tool that supports both cognitive and metacognitive development.

Regarding student engagement, approximately 80% of participants reported increased motivation and active participation when using GenAI. This result contributes to international discussions on AI and learner motivation by linking GenAI use to principles of Self-Determination Theory (Deci & Ryan, 2000). The data suggest that GenAI supports autonomy (independent exploration), competence (immediate feedback), and engagement in collaborative tasks (Ryan & Deci, 2000; Kasneci et al., 2023; Mollick, 2024). Compared with studies in other regions, these findings provide additional evidence that motivational benefits of AI are not context-bound but may be broadly applicable when pedagogically structured (Holmes et al., 2022; Zawacki-Richter et al., 2019).

However, the study also identifies significant challenges. Concerns about overreliance on AI, diminished critical engagement, and the potential erosion of independent thinking have been increasingly highlighted in recent GenAI literature (e.g. Kasneci et al., 2023; Mollick, 2024). Unlike some earlier studies that primarily emphasize the benefits of AI in education, this research demonstrates how contextual factors, including limited digital literacy and infrastructure constraints, shape the effectiveness of GenAI implementation. The study therefore contributes to a more balanced understanding of GenAI by illustrating both its pedagogical potential and its risks within a developing-country university context.

Ethical concerns were also prominent, particularly regarding plagiarism, authorship, and academic integrity. Only 55% of students expressed confidence in ethical AI use, indicating a gap in AI literacy. This finding adds to global calls for integrating AI ethics education into curricula and supports recent international guidance on responsible AI implementation in higher education (UNESCO, 2023). The study therefore contributes empirical support for institutional policy development, especially in contexts where formal AI guidelines are still emerging.

In addition, restricted device access and unstable internet connectivity highlight structural challenges that influence AI adoption. While such barriers may appear context-specific, they reflect broader global equity concerns in educational technology integration. By documenting these constraints, the study extends existing literature by demonstrating how infrastructure inequalities can moderate the effectiveness of GenAI implementation in under-resourced higher education systems.

Overall, this study contributes to the growing international body of knowledge by providing empirical evidence from an Ethiopian university context, integrating theoretical perspectives (Vygotsky's ZPD and Self-Determination Theory), and offering context-sensitive insights into both the benefits and limitations of GenAI in English language learning. The findings reinforce global arguments for human-centred, ethically grounded, and pedagogically structured AI integration in higher education. Nevertheless, it needs to be acknowledged that the study is geographically limited to a single university which may limit the generalizability of its findings to other higher education contexts.

5.2. Pedagogical implications

The findings of this study align with previous research emphasizing that artificial intelligence tools should function as supplementary resources rather than replacements for human instruction (UNESCO, 2023; Kasneci et al., 2023). Consistent with recommendations in the literature, AI should be integrated in ways that enhance, rather than diminish, the role of the instructor. Teachers play a critical role in guiding students toward meaningful engagement with AI outputs, including critical evaluation, reflection, and synthesis of information (Kasneci et al., 2023; Mollick, 2024).

This perspective supports broader discussions in educational technology scholarship that advocate for human-centred AI integration (Zawacki-Richter et al., 2023; Bearman et al., 2024).

Furthermore, the need for structured professional development identified in this study aligns with recent research highlighting ongoing gaps in instructors' preparedness for GenAI-mediated teaching (Bearman et al., 2024; Chan & Hu, 2023). Empirical studies in higher education contexts indicate that academics are still actively negotiating how to interpret, evaluate, and integrate GenAI into teaching and assessment practices, with many reporting uncertainty about its pedagogical implications and assessment validity (Chan & Hu, 2023). This emerging literature suggests that instructor responses to GenAI are shaped not only by general digital competence, but also by evolving understandings of authorship, academic integrity, and AI-informed learning design (Cotton et al., 2024; Li et al., 2024).

In addition, while earlier frameworks, such as *Technological Pedagogical Content Knowledge* (TPACK) (Mishra & Koehler, 2006), remain useful for conceptualising technology integration, recent developments in GenAI scholarship suggest a need to extend these models to account for dynamic human AI co-creation and prompt-based knowledge work (Williamson & Eynon, 2020). The reported lack of confidence among instructors in designing AI-supported activities (Chan & Hu, 2023) therefore underscores the urgency of targeted training initiatives, continuous professional learning, and institutional support systems to ensure pedagogically sound and ethically responsible implementation.

Third, curriculum designers should consider incorporating structured AI-based tasks that align with learning objectives, balancing AI support with opportunities for independent problem-solving. For example, assignments could involve iterative drafting where students generate initial ideas with AI assistance, followed by instructor-guided revision, justification, and critical validation to ensure conceptual depth, transparency of use, and academic integrity (Mollick, 2024; UNESCO, 2023). Finally, ethical guidelines and digital literacy education must be embedded systematically within the curriculum to foster responsible AI engagement and minimize risks related to plagiarism and misuse (UNESCO, 2023; Cotton et al., 2024).

5.3. Theoretical contributions

This study contributes to the theoretical discourse on AI in education by bridging cognitive learning theory, constructivist pedagogy, and technology-enhanced learning frameworks through the lens of the study's conceptual model of responsible GenAI use (Section 2.4). In particular, the model provides an integrative structure that connects pedagogical mediation, cognitive balance, ethical and AI literacy, and institutional support, thereby allowing these previously separate strands of literature to be examined in a unified way. By situating GenAI as a scaffolding tool within this framework, the findings demonstrate how AI can extend learners' cognitive capacities while maintaining the centrality of instructor guidance, consistent with both cognitive learning principles and constructivist pedagogy. At the same time, the analysis shows that the educational value of such scaffolding depends on maintaining cognitive balance, ensuring ethical and informed use, and addressing institutional constraints, rather than on technological access alone. In this sense, the conceptual model not only organizes the empirical findings but also extends existing theoretical perspectives by showing how they interact in practice within a developing higher education context. This provides a more holistic lens for understanding GenAI-mediated learning and offers a transferable framework for future research and policy discussions in similar educational settings.

6. Recommendations

Consistent with prior research on artificial intelligence in education (e.g., Holmes et al., 2019; Zawacki-Richter et al., 2019) and informed by the study's conceptual model of responsible GenAI use, several recommendations are proposed for the effective and ethical integration of generative

AI in English language learning. The model provides a structured lens, incorporating pedagogical mediation, cognitive balance, ethical and AI literacy, and institutional support through which the following implications are framed, making them relevant not only to Mattu University but also to similar higher education contexts internationally where AI adoption is emerging under conditions of uneven resources and varying digital literacy.

From a pedagogical mediation (CM1) perspective, instructors should design tasks where GenAI functions as a supportive scaffold rather than a substitute for student learning or thinking. For example, students may use AI to generate initial ideas or receive formative feedback, but must independently develop, revise, and critically refine their own written work. This ensures that AI use supports learning processes without displacing essential cognitive engagement, in line with concerns about over-reliance identified in cognitive balance (CM2).

In relation to cognitive balance (CM2), instructional design should explicitly promote critical engagement with AI outputs rather than passive acceptance. Tasks should require students to evaluate, compare, and justify their use of AI-generated suggestions, thereby preserving opportunities for higher-order thinking and independent problem-solving.

Regarding ethical and AI literacy (CM3), structured instruction is needed to support students' understanding of academic integrity in AI-assisted environments. This includes guidance on appropriate acknowledgment of AI use, responsible prompting, critical evaluation of generated content, and avoidance of inappropriate substitution of AI output for original work.

From an institutional support (CM4) perspective, universities should address infrastructural inequalities that shape access to GenAI tools, including internet connectivity and device availability, while also developing clear institutional policies on acceptable AI use, assessment practices, data privacy, and academic integrity. Professional development programmes for instructors should similarly integrate pedagogical, technical, and ethical dimensions of GenAI use to ensure confident and informed implementation across disciplines.

Finally, consistent with the conceptual model, continuous evaluation mechanisms should be established to assess how GenAI integration is functioning across these four dimensions, enabling institutions to iteratively refine practice based on feedback from both students and instructors. In this way, the model provides not only a descriptive framework but also a practical guide for sustainable and context-sensitive AI integration in higher education globally.

Declarations

Ethical approval

Participation was entirely voluntary, and informed consent was obtained from all participants.

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Data availability

The datasets generated and analysed during this study are available from the corresponding author upon reasonable request.

Competing interests

The author declares that there are no conflicts of interest or competing interests related to this research.

AI use

In this manuscript, ChatGPT was used by the researcher for editing, grammar correction, and other language-related improvements to enhance clarity, coherence, and overall quality of the

text. The tool was applied solely as a supportive language refinement resource. The content, analysis, interpretation, and conclusions remain entirely the responsibility of the author.

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