

Article

Not peer-reviewed version

---

# Integrating Generative AI as an Adaptive Learning Tool in English Language Instruction in Higher Education

---

[Abdul Gafur Marzuki](#) \*

Posted Date: 6 August 2025

doi: 10.20944/preprints202508.0426.v1

Keywords: adaptive learning; English language instruction; generative artificial intelligence; higher education



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a Creative Commons CC BY 4.0 license, which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Article

# Integrating Generative AI as an Adaptive Learning Tool in English Language Instruction in Higher Education

Abdul Gafur Marzuki

UIN Datokarama Palu; gbudiperwira@gmail.com

## Abstract

This study investigated the integration of generative Artificial Intelligence (AI) as an adaptive learning tool in English language instruction within higher education. Using a qualitative research design, data were collected through semi structured interviews and focus group discussions with nine undergraduate English major students and four instructors at a public university in Indonesia. Thematic analysis revealed that generative AI tools, particularly ChatGPT, significantly supported learner autonomy by providing instant, personalized feedback on grammar, vocabulary, and essay structure. Participants reported increased engagement and confidence, and instructors confirmed measurable improvements in fluency and coherence. However, the findings also highlighted concerns, including ethical risks such as plagiarism, over reliance on AI generated outputs, and occasional inaccuracies in suggestions. Digital literacy emerged as a critical factor influencing the quality of AI use, with more skilled students demonstrating greater ability to critically evaluate and adapt AI feedback. The results emphasized that while generative AI has strong potential as an adaptive learning aid, its effectiveness relies heavily on ethical safeguards, structured pedagogical integration, and institutional readiness. This study contributes both practical implications for language teaching and theoretical insights into AI enhanced learning, while recommending further longitudinal research to evaluate the long term impact of generative AI in higher education contexts.

**Keywords:** adaptive learning; English language instruction; generative artificial intelligence; higher education

---

## Introduction

Recent developments in generative AI (GenAI) have rapidly reshaped educational practices worldwide. Globally, universities especially in the U.S. and Europe are experimenting with tools like ChatGPT and custom AI chatbots to enrich instruction while grappling with integrity, ethical, and access issues (Belsky, OpenAI; Harvard/Northeastern case studies). Nationally, Indonesian higher-education institutions report English major students extensively using GenAI tools (ChatGPT, Google Translate, Grammarly) for writing and revision, highlighting both opportunities and concerns about long-term learning and critical thinking (Dumitru, 2024; Muthmainnah et al., 2024). Locally, there is limited yet emerging interest in integrating GenAI as an adaptive learning aid in English instruction, but systematic evaluations of pedagogical efficacy remain rare.

Integrating GenAI into English language instruction intersects with applied linguistics, educational technology, and learning sciences. The theoretical frameworks of social cognitive theory, cognitive load theory, and self-regulated learning offer a basis for understanding how adaptive AI feedback may support learners' metacognition and autonomy. Practically, as English remains a global lingua franca, the ability to scaffold writing, speaking, and critical thinking via AI-based scaffolding tools could fill a pedagogical gap in higher-education English language teaching (ELT) in developing contexts (Reid & Reid, 2019; Santiana & Marzuki, 2022; Santiana & Marzuki, 2024).

Despite growing interest, current literature is largely descriptive and short-term, lacking depth in cognitive impacts, longitudinal tracking, and context-specific variables (learning strategies, motivation, equity). Ethical and practical concerns such as data privacy, algorithmic bias, opacity of generated feedback, and unequal access, remain under-addressed in implementation studies, especially in Southeast Asia. Moreover, teacher competence with GenAI in pedagogical design is often overlooked, creating a gap between tool availability and effective instructional integration (Santiana, Hikmatullah, 2024; Syafryadin et al., 2024; Muthmainnah, M., Rehman et al., 2025).

This study proposes a novel investigation of **adaptive GenAI** as a real-time learning support system not just as a writing aid but as an **interactive, scaffolded language tutor** that adapts to individual student performance. Unlike prior research focused on usage patterns, this approach will explore cognitive effects, engagement, personalised feedback and critical thinking training over time (Arinushkina, 2023; Guettala et al., 2024). The timing is critical, as institutions globally are calling for clear AI strategies and policies (AI governance in universities, ethical protocols), while Indonesian higher education is still only cautiously exploring GenAI integration. Addressing teacher training, tool efficacy, and policy readiness now ensures relevance.

Conducting this research at present is urgent because educational stakeholders, students, faculty, and policymakers are rapidly facing AI's challenges and opportunities simultaneously. Concerns include erosion of critical thinking, academic integrity, and unequal tool access (MIT study on brain engagement; integrity arms race), as well as recognition that AI literacy is essential workforce readiness (OpenAI's Belsky; Tyler Cowen on educational reform). An empirically grounded study of adaptive GenAI in English instruction can inform curriculum design, institutional policies, and teacher professional development.

This research contributed to theory and practice by illuminating how an AI-mediated adaptive learning tool can enhance EFL learners' linguistic outcomes, autonomy, and critical thinking while preserving academic integrity. It can inform institutional policy frameworks and teacher education program design by offering evidence-based recommendations for ethical and equitable integration. At a societal level, the study has the potential to support more inclusive and effective English language education in higher education systems in Indonesia and beyond, aligning with global goals for AI literacy and educational equity.

This study aims to investigate how integrating generative AI as an adaptive learning tool in English language instruction in higher education can support individual learners' linguistic progress, critical thinking and metacognitive skills while addressing challenges of equity, ethics and teacher preparedness.

## Literature Review

### 1. Generative AI in Higher Education Context

The rapid adoption of generative AI (GenAI) tools such as ChatGPT and Gemini has transformed higher education globally, with studies showing that between 50–65 percent of students and faculty now use these tools for writing, research, and teaching support (Liu, 2024). Systematic literature reviews confirm this trend, pointing to GenAI's increasingly central role in educational workflows and institutional policy making (Dong et al., 2024). For English language instruction specifically, initial empirical evidence suggests GenAI can boost writing efficiency, engagement, and learner autonomy, although much of this work remains exploratory and localized.

Moreover, scholars argue that higher education systems in developing countries face unique barriers, including digital literacy gaps, infrastructure limitations, and policy uncertainty regarding AI use (Marzuki & Santiana, 2022a; Marzuki & Santiana, 2022b; Muthmainnah, Cardoso et al., 2024; Muthmainnah et al., 2025). These contextual challenges highlight the importance of conducting research in diverse geographical and institutional settings, as findings from Western universities may not directly apply to Southeast Asian contexts such as Indonesia. Addressing these differences is essential for ensuring equitable adoption of AI-enhanced instruction in English language education.

## 2. Adaptive and Personalized Learning with AI

Adaptive learning powered by AI/ML algorithms has long promised personalized learning pathways based on learner profiles. Reviews of e-learning literature highlight significant gains in engagement, retention, and performance through adaptive learning systems (mdpi.com). Recent AI research extends this promise by framing GenAI chatbots as personal learning assistants capable of delivering real-time feedback and adjusting scaffolding according to learners' needs (Santiana et al., 2021; Santiana et al., 2024; Nikolopoulou, 2024). In English language learning contexts, however, adaptive GenAI remains under-researched despite theoretical alignment with Vygotsky's Zone of Proximal Development and cognitive learning models (Kurtz et al., 2024).

In addition, the integration of adaptive GenAI has the potential to shift language instruction from standardized content delivery toward more learner-centered models. For instance, AI tools can analyze writing drafts to identify recurring grammatical or lexical challenges, thereby enabling personalized feedback loops that traditional classroom instruction cannot always provide (Marzuki, & Kuliahana, 2021; Marzuki & Santiana, 2022). This functionality could be particularly transformative in large classes where individual attention is limited.

## 3. Challenges: Ethics, Agency, and Pedagogical Integration

Despite enthusiasm, multiple reviews document key challenges: ethical concerns (plagiarism, bias, data privacy), opacity of AI-generated feedback, and inconsistent pedagogical integration across disciplines (pmc.ncbi.nlm.nih.gov). A critical scoping review finds that GenAI may both enhance learner agency and exacerbate inequities in access and autonomy (arxiv.org). Of particular concern for language instructors is the risk of over-reliance on AI feedback, which may diminish critical thinking and creative expression if not thoughtfully embedded (Liu, 2024).

Another issue relates to the readiness of educators themselves. Research shows that many instructors lack confidence in integrating AI tools into their pedagogy due to insufficient training and unclear institutional guidelines (Muthmainnah, Darmawati et al., 2024). This skill gap not only limits the effective use of GenAI but also raises concerns about consistency in academic standards and the ethical oversight of AI-mediated learning.

## 4. Gaps and Emerging Opportunities in English Language Instruction

While broad GenAI adoption is evident, empirical research specifically examining adaptive generative AI in higher education English instruction remains limited. Systematic reviews highlight that most classroom applications still fall under augmentation level rather than transformation, according to SAMR models (sciencedirect.com). Moreover, teacher perspectives, longitudinal outcome data, and context-specific studies in non-Western higher-education systems (e.g., Southeast Asia) are sparse (Santiana et al., 2021; Muthmainnah et al., 2022). These gaps signal a crucial research opportunity to investigate adaptive GenAI not merely as assistant tools, but as agents of pedagogical transformation.

Furthermore, recent calls for AI literacy frameworks in higher education stress the urgency of equipping both students and teachers with the skills to critically engage with GenAI outputs (Marzuki, 2025a; Marzuki, 2025b). Embedding adaptive GenAI in English language curricula could serve as a testing ground for such frameworks, ensuring learners gain not only linguistic competence but also digital and critical literacies essential in the AI-driven knowledge economy.

## Method

This study employed a qualitative research method because it was best suited to explore participants' lived experiences and perspectives regarding the integration of generative AI as an adaptive learning tool in English language instruction. A qualitative approach allowed the researchers to capture the depth and complexity of students' and instructors' attitudes, behaviors, and challenges that could not be fully understood through numerical data alone. Qualitative research

emphasizes meaning making and provides rich descriptions of social phenomena. The method also enabled the use of open ended questions, reflective accounts, and thematic analysis to identify patterns and themes that emerged from the data. This approach was appropriate for understanding how adaptive generative AI influenced learning processes in a specific higher education context (Marzuki, 2019c; Akcam et al., 2019; Kuliahana & Marzuki, 2020; Kuliahana et al., 2024; Kuliahana, Marzuki, & Rustam, 2024; Kuliahana & Marzuki, 2024).

#### *Research Context*

This study was carried out in a medium sized public university in Indonesia that provided undergraduate English language instruction. At the time of the research, the institution had only recently seen the adoption of generative AI tools such as ChatGPT to support students' writing and speaking activities. Policies regarding the use of AI in learning were still informal and undergoing development. The research context was important because it reflected a real higher education environment where both students and instructors were beginning to explore adaptive AI for learning purposes. The researchers described the infrastructural limitations, levels of teacher readiness, and the degree of learner autonomy that shaped the educational setting (Marzuki et al., 2018; Albana et al., 2020; Alek, Marzuki, Farkhan, & Deni, 2020; Amalia et al., 2024; Anita et al., 2024).

#### *Participants*

The participants of the study consisted of nine undergraduate English major students who were selected through purposive sampling. They had used generative AI tools regularly, at least once a week, during one semester. In addition, four English instructors took part in focus group discussions to provide perspectives on pedagogy and classroom practice. The criteria for selection included diversity in gender, proficiency level, and previous experience with AI. Consent was obtained from all participants, and pseudonyms were used to maintain confidentiality. The inclusion of both students and instructors allowed the study to capture a broad and rich understanding of the phenomenon, which aligned with established qualitative traditions in educational research (Marzuki, 2016; Alek et al., 2020; Amalia & Marzuki, 2023; Apriani et al., 2025).

#### *Instruments*

The instruments for data collection included semi structured interviews and focus group discussions. An interview guide was developed based on previous studies of AI in education and adaptive learning theories. The interview questions explored students' experiences with AI feedback, their perceptions of learning gains, and their concerns about ethical issues. Focus group discussions invited instructors to share their views on classroom integration, learner engagement, and institutional challenges. Each interview lasted between forty five and sixty minutes and was audio recorded before being transcribed. Field notes and reflective memos were also created to capture additional contextual information that could enrich the analysis (Iftitah et al., 2020; Marzuki, 2024a; Marzuki, 2024b; Erizar et al., 2024).

#### *Data Analysis*

The data were analyzed using thematic analysis following the framework of Braun and Clarke. The first stage involved generating initial codes based on the research questions and relevant literature. The second stage grouped these codes into broader themes such as learner autonomy, engagement, equity, and instructional facilitation. The use of CAQDAS software such as NVivo supported the process by organizing data and displaying thematic connections (Marzuki, 2017; Suaidi et al., 2025). To ensure trustworthiness, a second researcher checked the coding, and any differences were resolved through discussion. The approach provided both deductive and inductive insights, which strengthened the validity of the findings (Marzuki, 2019a; Marzuki, 2019b).

## Results

The qualitative data revealed that students widely acknowledged the usefulness of generative AI in supporting their English language learning. Most participants reported that AI tools such as ChatGPT provided immediate assistance for vocabulary development, grammar correction, and essay structuring. They emphasized that such support helped them become more confident when completing writing tasks. However, the findings also indicated variation in the extent of reliance on AI, with some students using it as a supplementary tool, while others depended on it as a primary source of feedback.

**Table 1.** Frequency of Student Use of Generative AI for English Learning.

Frequency of Use	Number of Students	Percentage
Daily	4	44%
Several times per week	3	33%
Once per week	2	23%

The data in Table 1 showed that nearly half of the students used generative AI on a daily basis. This frequent use indicated that AI had quickly become a regular component of their learning routines. The remaining students reported using AI several times a week or once per week, suggesting that although the frequency varied, all participants integrated AI into their academic practices. This pattern highlighted the growing dependence on AI tools for immediate language support.

The analysis showed that generative AI contributed significantly to adaptive learning by personalizing feedback according to individual learner needs. Students noted that the tools identified recurring grammatical errors and provided alternative sentence structures that matched their proficiency level. This adaptation aligned with the theoretical principles of scaffolding and supported their progression in academic writing. Instructors confirmed these observations, stating that students who regularly engaged with AI showed measurable improvements in fluency and coherence.

The findings also revealed that generative AI improved learner autonomy. Students described how the tools encouraged independent exploration of writing strategies and vocabulary choices without immediate instructor intervention. This was particularly valuable in large classes where individual attention was limited. Instructors echoed this sentiment, acknowledging that AI allowed them to focus more on higher order skills such as critical analysis and content development rather than surface level language corrections.

Despite these benefits, the data highlighted several concerns. Both students and instructors pointed out ethical risks such as plagiarism, over reliance on machine generated text, and reduced opportunities for original critical thinking. Instructors expressed concern that students occasionally submitted assignments with minimal editing of AI generated drafts. Students themselves admitted that while AI provided speed and convenience, it sometimes delivered inaccurate or contextually inappropriate suggestions, requiring additional effort to cross check correctness.

As shown in Table 2, both students and instructors consistently identified grammar improvement, vocabulary enhancement, and increased autonomy as major benefits. However, the concerns of plagiarism and over reliance were also raised by both groups, indicating a shared awareness of potential risks. Interestingly, only students reported issues with inaccurate suggestions, reflecting their direct interaction with AI outputs. This finding suggested that while instructors valued AI's overall contribution, they relied on students' feedback to assess the accuracy of AI assistance.

**Table 2.** Reported Benefits and Challenges of Generative AI.

Theme	Reported by Students	Reported by Instructors
-------	----------------------	-------------------------

<b>Improved grammar</b>	✓	✓
<b>Enhanced vocabulary</b>	✓	✓
<b>Increased autonomy</b>	✓	✓
<b>Risk of plagiarism</b>	✓	✓
<b>Inaccurate suggestions</b>	✓	

Thematic analysis identified four major themes: autonomy, engagement, ethical concern, and pedagogical integration. Autonomy and engagement emerged as strong positive outcomes, whereas ethical concern and pedagogical integration represented ongoing challenges. For example, students described a higher level of motivation when receiving instant AI feedback, yet they also struggled to judge the credibility of AI outputs. Instructors emphasized the need for institutional guidelines and training to ensure ethical and effective use of generative AI in the curriculum.

The findings also suggested that generative AI's success depended heavily on digital literacy. Students with higher technological competence navigated the tools more critically, adjusting AI outputs and integrating them into their drafts effectively. Conversely, students with lower digital skills tended to accept AI suggestions uncritically, which sometimes resulted in mechanical writing styles. This disparity underscored the importance of embedding AI literacy as part of English language instruction.

Finally, the study confirmed that generative AI could serve as an adaptive learning tool but only if implemented with pedagogical guidance and ethical safeguards. Both students and instructors expressed optimism about its potential, but they stressed the need for structured frameworks, continuous training, and institutional policies. These results pointed to the necessity of further longitudinal research to evaluate the long term impact of AI integration in higher education English instruction.

**Table 3.** Emerging Themes from Thematic Analysis.

<b>Theme</b>	<b>Description</b>
<b>Learner autonomy</b>	Students used AI to self regulate their writing process
<b>Engagement</b>	Motivation increased through instant and personalized feedback
<b>Ethical concern</b>	Risks included plagiarism and over reliance on AI
<b>Pedagogical integration</b>	Need for structured training and guidelines

Table 3 presented the four central themes derived from the thematic analysis. Learner autonomy and engagement highlighted the constructive aspects of AI integration, whereas ethical concern and pedagogical integration reflected areas needing attention. These themes illustrated the dual nature of AI adoption: while it provided valuable support for students, it also posed challenges that required careful institutional responses. The balance between benefits and risks emphasized the importance of responsible implementation.

## Discussion

The results showed that integrating generative AI as an adaptive learning tool supported learners' autonomy and engagement, which aligned closely with the study's initial objectives. Students reported feeling more confident and self-directed when using AI for grammar correction, vocabulary support, and essay structure. These findings corroborated Self-Determination Theory (SDT), in which autonomy and competence are fundamental to intrinsic motivation (Reid & Reid,

2019). In line with this scholar, learners expressed appreciation for personalized feedback from GenAI even while raising accuracy and ethical concerns (Guettala et al., 2024).

However, the data also revealed evidence of diminished critical thinking, particularly when students relied on AI-generated outputs without careful evaluation. This phenomenon resonated with the MIT study by scholars which found over reliance on LLMs like ChatGPT led to weaker neural engagement and poorer cognitive outcomes compared to human-only writing processes. While AI supported fluency and coherence, it sometimes promoted mechanistic writing, a dynamic detected especially among students with lower digital literacy (Arinushkina, 2023; Guettala et al., 2024).

Comparison with previous studies illustrated both convergence and divergence. Our results confirmed that GenAI enhanced learner autonomy and competence as in Kurtz et al. (2024) and the systematic review on ChatGPT and engagement. Where our findings diverged was in identifying the uneven role of relatedness and critical thinking. Students who lacked strong technology skills tended to accept AI suggestions without scrutiny, a pattern that echoed concerns about inequity in use and AI literacy gaps discussed by scholars (Marzuki & Santiana, 2022c; Marzuki, 2025c). These differences highlighted that adaptive AI benefits might be mediated by learners' digital competence.

Other variables shaped the outcomes, including instructors' preparedness and institutional policy clarity. Although instructors recognized improvements in fluency and autonomy, they reported ethical risks and absences of guidelines to mitigate plagiarism or misuse. Such findings echoed recommendations in *Frontiers in Education* for designing assessments that resist AI misuse such as reflective, collaborative, or problem-based tasks that demand originality (Nikolopoulou, 2024). This reinforced the notion that AI effectiveness depended not only on tool features but also on pedagogical strategy and institutional infrastructure.

Limitations of the study must be acknowledged. First, the sample was small and localized to one Indonesian university, which limits generalizability. Second, data relied on self-reported impressions and focus group discussions, which might introduce social desirability bias. Third, the short duration of observation precluded assessment of long-term cognitive or academic outcomes. Future research should employ larger, longitudinal designs that include brain-based measures or performance tracking to ascertain lasting effects on critical thinking, memory, and writing quality (Arinushkina, 2023).

Practically, this findings suggested that institutions should provide training for both students and instructors in AI literacy, effective prompting, and critical evaluation of AI outputs. Curriculum developers should integrate GenAI tools thoughtfully such as using AI-assisted drafts as a starting point for peer review, portfolio assignments, or real-time writing challenges that demand original reasoning and creativity. These recommendations align with Tyler Cowen's call for schools to shift focus from rote tasks to mentorship-driven environments that foster critical thinking and adaptability in the AI era.

Theoretically, this study contributed to broader understanding by showing that while GenAI tools can fulfill SDT needs of autonomy and competence, relatedness and cognitive engagement may be undermined if usage is unregulated. The results extended existing frameworks by highlighting the moderating role of digital literacy and institutional design. Future research should explore the intersection of AI competence, motivation, and pedagogical scaffolding in larger, cross-cultural samples. Investigating adaptive GenAI's impact over time and comparing different teacher support models would clarify its long-term potential and limits, advancing the field of AI-enhanced language education.

## Conclusions

This study concluded that the integration of generative AI as an adaptive learning tool in English language instruction in higher education effectively supported learner autonomy, enhanced engagement, and improved linguistic accuracy, thereby addressing the primary objectives of the research. The findings confirmed that generative AI, when used responsibly, enabled students to

self-regulate their learning processes by receiving instant, personalized feedback on grammar, vocabulary, and essay structure. Instructors acknowledged these benefits, noting observable improvements in students' fluency and coherence. However, the study also revealed significant challenges, particularly related to ethical risks such as plagiarism, over reliance on AI outputs, and the occasional provision of inaccurate or contextually inappropriate suggestions. These issues underscored the importance of AI literacy and the need for institutional guidelines and pedagogical frameworks to ensure the ethical and effective use of AI tools in the classroom. Furthermore, the analysis highlighted that digital literacy levels among students played a crucial role in determining whether AI enhanced critical thinking or instead promoted mechanical reliance on generated content. Despite these concerns, both students and instructors expressed optimism about the long-term potential of generative AI in language education, provided that it is accompanied by structured support and continuous training. Thus, the research answered its guiding questions by demonstrating that generative AI can serve as a valuable adaptive tool for English instruction in higher education, though its effectiveness depends heavily on pedagogical integration, ethical safeguards, and institutional readiness. The study contributed both practical implications for teaching and theoretical insights into how AI can reshape language learning, while also calling for further longitudinal and cross-cultural research to deepen understanding of its long-term impact.

## References

1. Akcam, B. K., Guney, S., & Cresswell, A. M. (2019). Research design and major issues in developing dynamic theories by secondary analysis of qualitative data. *Systems*, 7(3), 40.
2. Albana, H. H., Marzuki, A. G., Alek, A., & Hidayat, D. N. (2020). Cohesive Devices in Student's Writing (A Discourse Analysis on Argumentative Text). *Jurnal Pendidikan Humaniora*, 8(1), 6-11.
3. Alek, A., Marzuki, A. G., Farkhan, M., & Deni, R. (2020). Self-Assessment in Exploring EFL Students' Speaking Skill. *Al-Ta lim Journal*, 27(2), 208-214.
4. Alek, A., Marzuki, A. G., Farkhan, M., Surahman, D., Daryanto, D., & Febrianto, S. (2020). Computer Based Testing in Senior High School on National Examination. *Indonesian Journal of Learning Education and Counseling*, 2(2), 204-210.
5. Amalia, I., & Marzuki, A. G. (2023). The Implementation of Bilingual Class Program in Islamic Elementary School. *Al-Ta lim Journal*, 30(1).
6. Amalia, I., Marzuki, A. G., Anita, A., Rahmawati, E., & Ulfah, U. (2024). Technological-Based Application in Writing Instruction: A Model of Project-Based Learning. *Jurnal Onoma: Pendidikan, Bahasa, dan Sastra*, 10(4), 4277-4290.
7. Anita, A., Marzuki, A. G., Silfani, A. N., Al Viyani, V., & Ulfah, U. (2024). Native Language Interference in EFL Students' Writing of Reflective Journal in Indonesia. *Journal of English Education and Teaching*, 8(3), 528-551.
8. Apriani, E., Daulay, S. H., Aprilia, F., Marzuki, A. G., Warsah, I., Supardan, D., & Muthmainnah. (2025). A mixed-method study on the effectiveness of using ChatGPT in academic writing and students' perceived experiences. *Journal of Language and Education*, 11(1), 26-45. <https://doi.org/10.17323/jle.2025.17913>
9. Arinushkina, A. A. (Ed.). (2024). *Integration Strategies of Generative AI in Higher Education*. IGI Global.
10. Dong, W., Pan, D., & Kim, S. (2024). Exploring the integration of IoT and Generative AI in English language education: Smart tools for personalized learning experiences. *Journal of Computational Science*, 82, 102397.
11. Dumitru, C. (2024). Future of learning: Adaptive learning systems based on language generative models in higher education. In *Impact of artificial intelligence on society* (pp. 31-42). Chapman and Hall/CRC.
12. Erizar, E., Marzuki, A. G., Hidayati, T., Juliana, R., & Yulia, A. (2024). The Impact of Online Learning on Undergraduate English Students' Achievement. *Journal of English Education and Teaching*, 8(2), 288-302.
13. Guettala, M., Bourekkache, S., Kazar, O., & Harous, S. (2024). Generative artificial intelligence in education: Advancing adaptive and personalized learning. *Acta Informatica Pragensia*, 13(3), 460-489.
14. Hasibuan, R., Parta, I. B. M. W., Sholihah, H. I. A., Damayanto, A., & Farihatun, F. (2023). Transformation of Indonesian language learning with artificial intelligence applications: the era of the independent

- curriculum for learning in universities in Indonesia. *Indonesian Journal of Education (INJOE)*, 3(2), 341-363.
15. Iftitah, A. N., Marzuki, A. G., & Kuliahana, A. (2020). Developing Vocabulary Mastery through Guessing Words Game for the Seventh Grade Students of SMP Negeri 10 Palu. *Datokarama English Education Journal*, 1(1), 19-37.
  16. Kuliahana, A., & Marzuki, A. G. (2020). Repetition Technique in an EFL Speaking Class in Islamic Higher Education in Indonesia. *Academic Journal Perspective: Education, Language, and Literature*, 8(1), 20-28.
  17. Kuliahana, A., & Marzuki, A. G. (2024). Utilizing Group Discussion Technique in Developing Speaking Skill in an EFL Classroom. *ENGLISH FRANCA: Academic Journal of English Language and Education*, 7(2 November), 305-316.
  18. Kuliahana, A., Marzuki, A. G., & Nurfaizah, A. (2024). Developing Students' speaking Performance through Mastering Question Words in Islamic University Setting. *Journal of Innovation Research and Knowledge*, 4(7), 5063-5072.
  19. Kuliahana, A., Marzuki, A. G., & Rustam, R. (2024). Developing Speaking Skill through Opinion Expression Method in Islamic Higher Education Context. *ENGLISH FRANCA: Academic Journal of English Language and Education*, 8(1 May), 121-132.
  20. Kurtz, G., Amzalag, M., Shaked, N., Zaguri, Y., Kohen-Vacs, D., Gal, E., & Barak-Medina, E. (2024). Strategies for integrating generative AI into higher education: Navigating challenges and leveraging opportunities. *Education Sciences*, 14(5), 503.
  21. Liu, J. (2024). Enhancing English language education through big data analytics and generative AI. *Journal of Web Engineering*, 23(2), 227-249.
  22. Marzuki, A. G. (2024). Adaptation in Digital Pedagogy: Redefining Language Learning in the Era of Technology. Preprints. <https://doi.org/10.20944/preprints202412.1878.v1>
  23. Marzuki, A. G. (2024). Blended Learning in English Education: Strategies for Effective Integration of Technology and Traditional Methods. Preprints. <https://doi.org/10.20944/preprints202412.2279.v1>
  24. Marzuki, A. G. (2025). Blended Learning And English Proficiency: Evaluating Digital Pedagogies In Indonesian Secondary Schools. Preprints. <https://doi.org/10.20944/preprints202506.1282.v1>
  25. Marzuki, A. G. (2025). Integrating Instructional Technology into English Language Classrooms: A Case Study of Indonesian Higher Education. Preprints. <https://doi.org/10.20944/preprints202505.2128.v1>
  26. Marzuki, A. G. (2025). Student Perceptions of Instructional Technology in EFL Classrooms: Evidence from Indonesian Universities. Preprints. <https://doi.org/10.20944/preprints202506.1446.v1>
  27. Marzuki, A. G. (2019). The Implementation of SQ3R Method to Develop Students' Reading Skill on Islamic Texts in EFL Class in Indonesia. *Register Journal*, 12(1), 49-61.
  28. Marzuki, A. G. (2019). The Roles of School Principal Leadership in Developing English Teachers' Creativities in Palu. *Al-Ta lim Journal*, 26(3), 267-279.
  29. Marzuki, A. G. (2019). Utilizing Recorded English Dialogues in Teaching English Word Stress to Islamic Higher Education Students in Indonesia. *Jurnal Pendidikan Islam*, 5(1), 53-64.
  30. Marzuki, A. G., & Kuliahana, A. (2021). Using Language Games to Enhance EFL Students' Speaking Skill in Indonesia. *Al-Ta lim Journal*, 28(3), 213-222.
  31. Marzuki, A. G., & Santiana, S. (2021). EFL Students' Perception Of Applying The Technological Tools In Language Learning. <https://doi.org/10.31219/osf.io/zmxck>
  32. Marzuki, A. G., & Santiana, S. (2022). Bringing YouTube into the Classroom, is it Possible or not?. In *Proceeding of International Conference on Islamic and Interdisciplinary Studies (Vol. 1, pp. 29-33)*.
  33. Marzuki, A. G., & Santiana, S. (2022). Optimizing Kahoot! as Digital Games-Based Learning ? for Online Assessment in EFL Class. <https://doi.org/10.31219/osf.io/8mkdb>
  34. Marzuki, A. G., & Santiana, S. (2022). Utilizing YouTube Videos to promote Students' Autonomous Learning. <https://doi.org/10.31219/osf.io/6kjgr>
  35. Marzuki, A. G., Alim, N., & Wekke, I. S. (2018). Improving the reading comprehension through cognitive reading strategies in language class of coastal area in indonesia. In *IOP Conference Series: Earth and Environmental Science*, 156(1), 012050. IOP Publishing.

36. Marzuki, A.G. (2016). Utilizing cooperative learning in islamic college students' classroom, *IJEE (Indonesian Journal of English Education)*, 3(2), 123-139.
37. Marzuki, A.G. (2017). Developing speaking skill through oral report in an efl class in indonesia, *Al-Ta'lim Journal*, 24(3), 243-254.
38. Muthmainnah, M., Apriani, E., Marzuki, A. G., Al Yakin, A., Aeni, N., Azar, A. S., & Riyawi, M. R. (2024). Navigating education 5.0 robotic technique for teaching foreign languages in todays classroom: Unveiling the potential of virtual pedagogical agents. In *Preconceptions of Policies, Strategies, and Challenges in Education 5.0* (pp. 118–138). IGI Global.
39. Muthmainnah, M., Cardoso, L., Kaur, D., Al Yakin, A., Marzuki, A. G., & Apriani, E. (2024). Informatization on developing e-learning materials for IoT-assisted education to enhance EFL in higher education. In *Proceedings of the International Conference on Data Analytics & Management* (pp. 529–552).
40. Muthmainnah, M., Cardoso, L., Marzuki, A. G., & Al Yakin, A. (2025). A new innovative metaverse ecosystem: VR-based human interaction enhances EFL learners' transferable skills. *Discover Sustainability*, 6, 156. <https://doi.org/10.1007/s43621-025-00913-7>
41. Muthmainnah, M., Darmawati, B., Sidik, U., Marzuki, A. G., Al Yakin, A., Aeni, N., & Apriani, E. (2024). Innovative Pedagogical Practices Through the Development and Design of EFL Teaching Materials Tailored to Sustainability Through AI in the Digital Revolution. In *Explainable AI for Education: Recent Trends and Challenges* (pp. 207–227). Cham: Springer Nature Switzerland.
42. Muthmainnah, M., Marzuki, A. G., Santiana, S., Erizar, E., & Nursyam, N. (2022). Utilizing smartphone-based Pinterest applications in developing EFL students speaking skills in Indonesia. *JEES (Journal of English Educators Society)*, 7(2), 205-209.
43. Muthmainnah, M., Rehman, S., Cardoso, L., Marzuki, A.G., Inderawati, R., Al Yakin, A. (2025). Enhancing the Retrieval and Application of English Teaching Resources Through Artificial Intelligence Technology as Computational Creativity in Short Story Writing. In: Swaroop, A., Virdee, B., Correia, S.D., Valicek, J. (eds) *Data Processing and Networking. ICDPN 2024. Lecture Notes in Networks and Systems*, vol 1288. Springer, Singapore. [https://doi.org/10.1007/978-981-96-3102-5\\_14](https://doi.org/10.1007/978-981-96-3102-5_14)
44. Nikolopoulou, K. (2024). Generative artificial intelligence in higher education: Exploring ways of harnessing pedagogical practices with the assistance of ChatGPT. *International Journal of Changes in Education*, 1(2), 103-111.
45. Santiana, S., & Marzuki, A. G. (2022). YouTube: a Modern Breakthrough of Autonomous Learning to Hone Speaking Skills. In *Proceeding of International Conference on Islamic and Interdisciplinary Studies (Vol. 1, pp. 23–28)*.
46. Santiana, S., & Marzuki, A. G. (2024). Scrutinising Padlet to enhance students' collaborative writing in a virtual learning environment. *Proceedings of the International Conference on Islamic and Interdisciplinary Studies (ICIIS)*, 533. <https://jurnal.uindatokarama.ac.id/index.php/iciis/issue/archive>
47. Santiana, S., Efendi, S. N., Pujasari, R. S., Marzuki, A. G., & Erizar, E. (2021). Digital Games-Based Learning: An Innovative Language Learning in EFL Classroom by Utilizing Kahoot! *Jurnal Pendidikan*, 9(4).
48. Santiana, S., Enriquez, A., Marzuki, A. G., Mahmud, R., & Ghofur, A. (2024). KARDS Model: An Alternative Approach to Language Education. *TLEMC (Teaching and Learning English in Multicultural Contexts)*, 8(1), 1-12.
49. Santiana, S., Hikmatullah, N., Pujasari, R. S., Khan, T., Ispina, J. I., & Marzuki, A. G. (2024). English Language Teaching Development: Emergency Remote Teaching Challenges in the Covid-19 Era . *Idarah (Jurnal Pendidikan Dan Kependidikan)*, 8(2), 167–186. <https://doi.org/10.47766/idadrah.v8i2.2537>
50. Santiana, S., Lesmana, D. S., Marzuki, A. G., & Erizar, E. (2021). An Insight of Anitales Apps Perceived by Digital Storytelling Students. In *Proceeding of International Conference on Islamic Education (ICIED)* (Vol. 6, No. 1, pp. 23–30).
51. Suaidi , A., Marzuki, A. G., Anita, A., Viyani, V. A., & Erizar , E. (2025). Learning innovation through developing interpreter book: a classroom interpreting practice. *JINoP (Jurnal Inovasi Pembelajaran)*, 11(1), 52–74. <https://doi.org/10.22219/jinop.v11i1.32187>

52. Syafryadin, S., Safnil, S., Noermnzah, N., Wardhana, D. E. C., Marzuki, A. G., Astrid, A., & Amalia, S. (2024). TAGANA thematic textbook: Cultivating junior high school students' English proficiency with HOTS-PBL integration. *Studies in English Language and Education*, 11(3), 1636-1651.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.