

# DEMOCRATIZING LANGUAGE PROFICIENCY: THE IMPACT OF GENERATIVE AI ON LEARNER AUTONOMY AND ACADEMIC INTEGRITY IN SECOND LANGUAGE ACQUISITION

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## Abstract

Generative artificial intelligence has rapidly transformed second language acquisition by providing learners with continuous access to automated feedback, translation support, grammar correction, and interactive language practice. Expansion of AI-assisted learning environments has increased opportunities for independent language development and reduced barriers associated with instructional access and linguistic anxiety. Simultaneous growth of AI integration in education has also generated concerns regarding academic integrity, technological dependency, and the authenticity of learner language production within academic contexts. This study aimed to examine the impact of generative AI on learner autonomy and academic integrity in second language acquisition. Particular attention was directed toward analyzing how AI-assisted language learning influences self-regulated learning behavior, writing performance, language confidence, and ethical awareness among second language learners in higher education environments. A mixed-methods sequential explanatory design was employed involving 300 undergraduate students enrolled in second language learning programs across three universities. Quantitative data were collected through learner autonomy scales, academic integrity perception questionnaires, and AI usage surveys, while qualitative findings were obtained through interviews, classroom observations, and reflective journals. Statistical analysis included ANOVA, regression analysis, and correlation testing to identify relationships between AI usage and educational outcomes. Results demonstrated that generative AI significantly improved learner autonomy, writing performance, and language confidence through personalized linguistic support and immediate feedback. High-frequency AI users, however, exhibited stronger technological dependence and lower academic integrity awareness regarding authentic language production. Findings confirm that generative AI democratizes language learning opportunities while simultaneously requiring balanced pedagogical frameworks supporting ethical engagement, authentic linguistic development, and responsible educational technology integration.

**Keywords:** Academic Integrity, Generative Artificial Intelligence, Language Learning, Learner Autonomy, Second Language Acquisition



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## INTRODUCTION

Rapid advancement in generative artificial intelligence (AI) technologies has transformed the landscape of language education and second language acquisition (SLA). AI-powered platforms capable of generating human-like text, providing instant translation, correcting grammar, and simulating interactive conversation have become increasingly accessible to language learners worldwide (Alam et al., 2026). Students now engage with digital tools such as conversational AI assistants, automated writing support systems, and adaptive language applications as part of their daily learning experiences (Algobaei & Alzain, 2026). Expansion of these technologies has created new possibilities for personalized instruction, independent practice, and continuous access to language support beyond traditional classroom boundaries.

Second language learning has historically been influenced by disparities in educational access, instructional quality, and learner confidence (Alhowaish et al., 2026). Students from diverse socioeconomic and linguistic backgrounds often experience unequal opportunities to develop communicative competence, academic writing proficiency, and authentic language interaction. Generative AI has introduced the possibility of democratizing language learning by reducing barriers associated with cost, geographical limitations, and restricted access to expert feedback (Alwashah et al., 2025). Personalized AI-supported learning environments may therefore enhance learner autonomy by enabling students to practice language skills independently, receive immediate corrective feedback, and engage in self-directed learning processes at their own pace.

Growing integration of generative AI into educational contexts has simultaneously generated ethical and pedagogical concerns regarding academic integrity, authorship, and the authenticity of language performance (Annamalai et al., 2025). Language educators increasingly confront challenges related to AI-assisted plagiarism, overreliance on automated writing tools, and difficulties in evaluating genuine learner competence. Questions have therefore emerged regarding whether generative AI strengthens meaningful language acquisition or encourages dependency that undermines authentic linguistic development (Asad et al., 2024). Such tensions position generative AI as both an opportunity and a challenge within contemporary SLA discourse, requiring critical examination of its impact on learner autonomy and academic integrity.

Despite the rapid adoption of generative AI technologies in language learning environments, uncertainty persists regarding their educational implications for second language acquisition (Azap, 2025). Many students rely heavily on AI-assisted translation, grammar correction, and text generation systems without fully understanding how such tools influence cognitive engagement, linguistic development, and independent learning capacity (Bajestani et al., 2026). Extensive dependence on automated language support may weaken learners' motivation to develop critical thinking, problem-solving abilities, and authentic communicative competence independently.

Educational institutions also face increasing challenges related to academic integrity in AI-mediated language learning environments (Barrios-Beltran, 2025). Traditional assessment models often struggle to distinguish between authentic learner production and AI-generated content, particularly in writing-intensive language courses. Existing plagiarism detection systems remain insufficiently equipped to identify nuanced forms of AI-assisted composition, creating uncertainty regarding fairness, assessment validity, and ethical educational practice (Chakraborty, 2026). Language instructors consequently encounter difficulties in balancing technological innovation with the preservation of academic honesty and learner accountability.

Empirical evidence regarding the relationship between generative AI, learner autonomy, and academic integrity remains fragmented and inconsistent. Existing studies frequently emphasize technological effectiveness or student perceptions while providing limited examination of how AI integration influences long-term language development and ethical learning behavior (J. Chen, 2025). Variability in learners' digital literacy, institutional policies,

and instructional approaches further complicates efforts to establish comprehensive pedagogical frameworks for responsible AI use in SLA contexts. Such conditions highlight the urgent need for systematic research capable of evaluating both the empowering and disruptive dimensions of generative AI within language education.

This study aims to investigate the impact of generative AI technologies on learner autonomy in second language acquisition. Particular attention is directed toward examining how AI-assisted language learning tools influence students' self-regulated learning behaviors, independent practice habits, confidence in language production, and access to personalized linguistic support (S. Chen & Cheung, 2025). Evaluation of these dimensions is expected to provide deeper understanding regarding the extent to which generative AI contributes to more democratized and accessible language learning experiences.

Another objective of this study is to analyze the implications of generative AI use for academic integrity within language education environments. The research seeks to examine how students utilize AI-assisted writing and language support systems, how educators perceive AI-mediated academic risks, and how institutional assessment practices adapt to emerging technological realities (Farangi & Nejadghanbar, 2026). Attention is also directed toward identifying ethical tensions between technological assistance and authentic language competence development.

The study further seeks to generate evidence-based recommendations for educators, curriculum developers, and educational policymakers concerning responsible integration of generative AI within second language learning environments (Hamidi, 2025). Findings are expected to contribute to the development of pedagogical frameworks balancing technological innovation, learner empowerment, ethical accountability, and authentic language acquisition processes. Such contributions may support more sustainable and equitable approaches to AI-assisted language education in increasingly digitalized academic environments.

Existing literature on generative AI in education primarily focuses on technological functionality, instructional efficiency, and student satisfaction while providing limited attention to learner autonomy within second language acquisition contexts (Izquierdo-Condoy et al., 2025). Many studies examine AI-assisted grammar correction, automated translation, or writing support tools without critically exploring how continuous reliance on such systems influences independent learning behavior, metacognitive awareness, and authentic communicative competence. Such limitations restrict broader understanding regarding the long-term pedagogical implications of AI-supported language learning.

Research concerning academic integrity and generative AI also remains conceptually fragmented. Previous investigations frequently emphasize plagiarism detection challenges or institutional policy responses without examining how students negotiate ethical decision-making during AI-assisted learning processes (Jia & Lu, 2026). Limited attention has been given to the intersection between learner autonomy and academic honesty, particularly regarding whether increased AI dependence weakens cognitive engagement and authentic language production. Existing scholarship therefore lacks integrated frameworks capable of addressing both educational empowerment and ethical vulnerability simultaneously.

Methodological limitations are additionally evident within current studies. Many investigations rely on cross-sectional surveys, small participant groups, or short-term experimental interventions that inadequately capture evolving learner behavior over time (Kewalramani et al., 2026). Cultural diversity, institutional context, and variation in digital literacy levels remain insufficiently explored despite their potential influence on AI adoption and ethical learning practices. Few studies examine generative AI within multilingual educational settings or investigate how different language proficiency levels shape students' interaction with AI-supported learning systems. Addressing these gaps is essential for developing balanced and context-sensitive approaches to AI integration in SLA research and practice.

This study introduces a novel contribution by examining generative AI simultaneously as a democratizing educational resource and a potential challenge to academic integrity within second language acquisition. Integration of learner autonomy and ethical accountability within a single analytical framework distinguishes this research from previous studies that tend to examine technological benefits and academic risks separately (Kohnke, 2024). Such an interdisciplinary perspective allows more comprehensive understanding regarding how generative AI reshapes language learning experiences, learner agency, and institutional educational practices.

Methodological innovation is reflected in the combination of behavioral analysis, learner perception assessment, and academic integrity evaluation within authentic educational settings. Investigation of students' AI usage patterns, self-regulated learning behaviors, and ethical decision-making processes enables multidimensional interpretation of generative AI's educational influence (Kwon et al., 2026). Longitudinal observation of learner adaptation further strengthens the analytical framework by capturing evolving patterns of technological dependence, autonomy development, and academic conduct over time.

Significance of this research extends beyond language education toward broader debates concerning artificial intelligence, educational equity, and the future of human learning. Generative AI increasingly influences academic communication, knowledge production, and assessment practices across educational systems worldwide (Law, 2024). Findings from this study are expected to provide evidence-based guidance for constructing pedagogical and ethical frameworks capable of supporting responsible AI integration while preserving authentic learning processes and academic integrity. Contributions to SLA research, digital pedagogy, and educational ethics may therefore inform future policy and instructional innovation within technology-mediated learning environments.

## **RESEARCH METHOD**

### ***Research Design***

This study employed a mixed-methods sequential explanatory design to investigate the impact of generative artificial intelligence (AI) on learner autonomy and academic integrity in second language acquisition (SLA). Quantitative methods were utilized to measure patterns of AI usage, levels of learner autonomy, language learning engagement, and perceptions regarding academic integrity among second language learners (Li et al., 2024). Qualitative approaches were subsequently implemented to explore learners' experiences, ethical considerations, and behavioral adaptation related to AI-assisted language learning practices. Integration of quantitative and qualitative findings enabled comprehensive interpretation of both measurable educational outcomes and contextual learner experiences associated with generative AI use in language education.

A comparative cross-sectional framework was implemented to examine differences between learners with varying frequencies of generative AI usage in academic language tasks. Participants were categorized into high-frequency, moderate-frequency, and low-frequency AI users based on reported engagement with AI-powered language support tools such as automated writing assistants, grammar correction systems, translation platforms, and conversational AI applications (Luo & Chen, 2025). Comparative analysis allowed examination of how differing levels of AI dependence influenced learner autonomy, self-regulated learning behaviors, and perceptions of academic integrity.

Methodological rigor was strengthened through triangulation of survey data, writing performance analysis, classroom observation, and semi-structured interviews. Statistical procedures included descriptive analysis, analysis of variance (ANOVA), multiple regression analysis, and correlation testing to identify relationships between AI usage patterns, learner autonomy indicators, and academic integrity perceptions. Qualitative thematic analysis was

conducted to examine recurring narratives regarding technological dependence, language confidence, ethical dilemmas, and independent learning strategies. Combination of these approaches facilitated multidimensional understanding of generative AI as both an empowering educational resource and a potential challenge to authentic language learning practices.

### ***Research Target/Subject***

The population of this study consisted of undergraduate students enrolled in second language learning programs at higher education institutions integrating digital learning technologies into language instruction. Participants represented learners studying English as a second or foreign language across diverse academic disciplines, including education, humanities, business, engineering, and social sciences (Ma & Zhu, 2026). Selection of university-level participants reflected increasing adoption of generative AI technologies among adult learners engaged in academic writing, language comprehension, and independent learning activities.

A purposive sampling technique was employed to select participants actively utilizing generative AI tools for language learning purposes. Three universities with established digital learning environments and access to AI-assisted educational platforms were selected as research sites. A total of 300 students participated in the quantitative phase of the study, while 30 participants representing different AI usage categories were selected for in-depth qualitative interviews. Sampling procedures ensured balanced representation regarding gender, academic level, language proficiency, and frequency of AI-assisted learning engagement.

Additional demographic and contextual information was collected to examine factors influencing AI-assisted language learning behavior. Variables included language proficiency level, prior digital literacy experience, frequency of AI tool usage, preferred AI applications, and institutional exposure to academic integrity policies. Language instructors and academic administrators also participated in interviews to provide institutional perspectives regarding AI integration, learner autonomy, and ethical concerns within second language learning environments. Ethical approval was obtained from participating institutions, and informed consent procedures were implemented to ensure confidentiality and participant protection throughout the research process.

### ***Research Procedure***

Research procedures began with institutional coordination and participant orientation sessions explaining the objectives, ethical considerations, and research activities associated with the study. Quantitative data collection commenced through administration of learner autonomy questionnaires, academic integrity perception scales, and AI usage surveys to all participating students. Initial writing assessments were subsequently conducted to evaluate baseline language proficiency and identify patterns of AI-assisted academic composition among participants.

Participants were then categorized according to frequency and intensity of generative AI usage in language learning activities. Classroom observations were conducted during second language instruction sessions to examine learner engagement, independent learning behavior, and interactions with AI-assisted educational tools (Nabhan & Habók, 2026). Students participating in the qualitative phase maintained reflective journals documenting experiences related to AI-supported language learning, emotional responses, learning confidence, and ethical concerns associated with academic task completion.

Semi-structured interviews were conducted following completion of quantitative data analysis to provide deeper contextual interpretation of learner experiences and institutional perspectives. Interview data were transcribed, coded, and analyzed thematically to identify

recurring patterns related to autonomy development, technological dependence, and academic integrity negotiation. Quantitative data were analyzed using statistical software to examine correlations, group differences, and predictive relationships between AI usage and educational outcomes. Integration of quantitative and qualitative findings occurred during the interpretation stage to generate comprehensive understanding regarding the influence of generative AI on learner autonomy and ethical academic practice in second language acquisition contexts.

### *Instruments, and Data Collection Techniques*

Data collection relied on multiple instruments designed to evaluate learner autonomy, AI-assisted learning behavior, and perceptions of academic integrity. Quantitative instruments included standardized learner autonomy scales adapted for second language acquisition contexts, measuring self-regulated learning, independent study habits, learning motivation, and confidence in language production. Academic integrity perception questionnaires were also administered to assess students' ethical awareness, attitudes toward AI-assisted academic work, and perceptions regarding authenticity in language learning tasks.

AI usage behavior was examined through structured digital learning questionnaires documenting frequency of AI tool engagement, types of AI-supported activities, and dependence on automated language assistance during academic tasks. Writing performance assessments were conducted to compare independently produced language outputs with AI-assisted compositions (Rahiem, 2026). Reliability testing using Cronbach's Alpha confirmed acceptable internal consistency across all quantitative instruments, while pilot testing was conducted to refine item clarity and contextual relevance for second language learners.

Qualitative instruments included semi-structured interview protocols and reflective learning journals. Interview questions explored learners' experiences using generative AI for language learning, perceptions regarding autonomy development, ethical decision-making processes, and challenges related to maintaining authentic language production. Reflective journals required participants to document personal experiences regarding AI-assisted learning activities throughout the research period. Classroom observation checklists were additionally employed to examine learner participation, independent problem-solving behavior, and patterns of AI-assisted academic interaction during language learning activities. Triangulation of quantitative and qualitative instruments strengthened the validity and credibility of the research findings.

### *Data Analysis Technique*

Furthermore, this study acknowledges that the influence of generative AI on learner autonomy and academic integrity is not static but dynamically shaped by learners' digital literacy, academic culture, and institutional regulations. Learners with stronger self-regulated learning abilities tended to utilize AI as a supportive educational tool rather than as a substitute for independent language production. This condition highlights the importance of balanced pedagogical supervision in maintaining authentic language learning processes within AI-assisted educational environments.

The study also recognizes the growing need for educational institutions to formulate adaptive academic integrity policies addressing generative AI usage in second language learning contexts. Institutional guidelines, ethical literacy programs, and transparent AI usage regulations may help learners develop responsible technological engagement while preserving originality and academic accountability. Such an approach strengthens the role of generative AI as a complementary learning resource that supports language development without undermining authentic learner competence.

## RESULTS AND DISCUSSION

The quantitative dataset consisted of 300 undergraduate students enrolled in second language acquisition courses across three higher education institutions. Participants were categorized into three groups based on frequency of generative AI usage in language learning activities: high-frequency users (38%), moderate-frequency users (42%), and low-frequency users (20%). Baseline assessment revealed that 81% of participants regularly used generative AI tools for grammar correction, 73% for academic writing support, 65% for translation assistance, and 58% for conversational language practice. Average weekly AI-assisted learning engagement reached 9.2 hours among high-frequency users.

**Table 1.** Descriptive Statistics of Generative AI Usage, Learner Autonomy, and Academic Integrity Perceptions in Second Language Acquisition

Variable	High-Frequency AI Users	Moderate-Frequency AI Users	Low-Frequency AI Users
Learner Autonomy Score	78.6	71.4	64.8
Language Confidence Score	82.1	75.9	68.7
Academic Integrity Awareness	59.3	68.5	74.2
AI Dependency Score	84.7	63.2	39.6
Writing Performance Score	86.4	79.1	70.5

Normality testing using the Shapiro Wilk procedure demonstrated acceptable distribution patterns across all major variables, permitting the application of parametric inferential analyses. Descriptive findings indicated that high frequency AI users demonstrated stronger learner autonomy and language confidence scores but simultaneously reported lower academic integrity awareness and significantly higher AI dependency levels compared to low-frequency AI users.

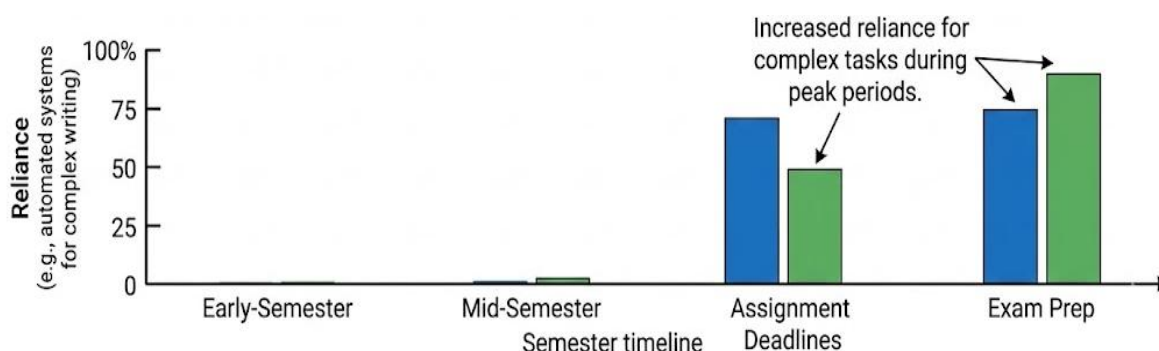
Secondary institutional reports further indicated increasing integration of generative AI within second language learning environments. Language instructors documented growing student reliance on AI-assisted writing tools for assignment completion, revision activities, and translation support. Academic integrity committees also reported increased uncertainty regarding assessment authenticity and ethical boundaries associated with AI-generated academic content within language learning courses.

Descriptive findings indicate that generative AI contributes positively to learner autonomy and language confidence among second language learners. Students engaging frequently with AI-assisted learning tools demonstrated stronger self-regulated learning behavior, greater willingness to practice independently, and increased confidence in written language production. Immediate feedback provided by generative AI systems appeared to encourage continuous language experimentation and reduce anxiety associated with grammatical errors and vocabulary limitations.

Higher writing performance scores among frequent AI users suggest that generative AI functions as an effective linguistic support mechanism for second language learners (Zou et al., 2025). Students reported that AI-assisted revision tools improved clarity, coherence, vocabulary variety, and grammatical accuracy in academic writing tasks. Such outcomes indicate that AI technologies may democratize access to personalized language feedback traditionally limited by instructional availability and institutional resources.

Concerns regarding academic integrity and technological dependence also emerged prominently within the findings (Zimik et al., 2026). High-frequency AI users demonstrated lower awareness regarding ethical boundaries associated with AI-assisted composition and greater reliance on automated systems during academic tasks. Several participants reported uncertainty regarding the distinction between legitimate learning assistance and inappropriate academic dependency. Such ambiguity suggests that increased technological access may simultaneously strengthen educational opportunities and ethical vulnerability.

Institutional observations further revealed inconsistencies in how educators and students interpreted responsible AI usage within second language learning contexts. Some instructors viewed AI as a supportive educational tool promoting learner independence, whereas others perceived excessive AI-assisted writing as a threat to authentic language development and assessment validity (Zhuang et al., 2025). These divergent perspectives reflect broader uncertainty surrounding pedagogical adaptation to generative AI integration.



**Figure 1.** High Frequency User Reliance and Timing

Longitudinal observation revealed evolving learner behavior patterns throughout the semester. Students initially using generative AI primarily for grammar correction gradually expanded usage toward idea generation, paraphrasing assistance, and complete sentence construction (Zhao & Wang, 2026). High-frequency AI users increasingly relied on automated systems for complex academic writing tasks, particularly during assignment deadlines and examination preparation periods.

Moderate-frequency users demonstrated more balanced patterns of AI engagement. These participants commonly utilized AI tools for revision support and language clarification while continuing to rely on independent cognitive effort during initial drafting processes (Yin et al., 2024). Such learners reported greater awareness regarding the educational value of maintaining personal linguistic experimentation despite technological assistance availability.

Differences were also observed across language proficiency levels. Lower-proficiency learners demonstrated stronger dependence on AI-assisted translation and vocabulary generation, whereas advanced learners used AI primarily for stylistic refinement and academic discourse organization. Students with limited confidence in second language production reported stronger emotional reliance on AI systems due to fear of linguistic error and academic judgment.

Institutional variation additionally influenced AI engagement behavior. Universities with explicit AI literacy guidelines and academic integrity workshops demonstrated lower levels of excessive technological dependency compared to institutions lacking formal instructional policies regarding generative AI usage (Yao & Liu, 2026). Structured educational guidance therefore appeared to influence students' ethical and pedagogical interaction with AI-assisted learning systems.

Analysis of variance (ANOVA) revealed statistically significant differences among AI usage groups regarding learner autonomy, language confidence, and academic integrity

awareness ( $p < .001$ ). High-frequency AI users demonstrated significantly higher learner autonomy scores compared to low-frequency users, indicating that generative AI positively influences self-directed learning behavior and independent language engagement.

Multiple regression analysis further demonstrated that AI-assisted feedback frequency significantly predicted improvements in writing performance and language confidence ( $\beta = .61$ ,  $p < .001$ ). Students engaging regularly with AI-supported revision activities exhibited stronger linguistic development outcomes and greater confidence in academic writing production. Such findings indicate that personalized AI feedback contributes substantially to second language learning effectiveness.

Negative relationships also emerged between excessive AI dependency and academic integrity awareness. Correlation analysis revealed a significant inverse relationship between AI dependency scores and ethical awareness regarding authentic language production ( $r = -.58$ ,  $p < .001$ ). Students heavily dependent on AI-assisted writing support demonstrated reduced confidence in producing independent academic language outputs without technological assistance.

Inferential findings additionally revealed that institutional AI literacy instruction moderated ethical learning behavior. Students participating in formal academic integrity workshops demonstrated stronger awareness regarding responsible AI usage and lower dependence on automated content generation. Educational guidance therefore emerged as an important mediating factor influencing ethical adaptation within AI-assisted language learning environments.

Strong positive relationships were identified between generative AI usage frequency and learner autonomy indicators. Students engaging consistently with AI-assisted language support tools demonstrated higher levels of independent practice, self-correction behavior, and willingness to experiment with complex language structures (Yang et al., 2026). Immediate AI-generated feedback appeared to reinforce students' confidence in managing language learning activities autonomously outside formal classroom environments.

Relationships between AI usage and writing performance were similarly substantial. Students frequently utilizing AI-assisted revision systems achieved stronger academic writing outcomes, particularly regarding grammatical accuracy, lexical diversity, and organizational coherence. Such findings suggest that generative AI may reduce educational inequalities by providing continuous language assistance to learners lacking access to individualized instructional feedback.

Negative relationships also emerged between technological dependency and authentic language confidence. Students exhibiting excessive reliance on AI-generated text demonstrated lower confidence in independently producing academic compositions without technological support (Xia & Guo, 2025). Such patterns indicate that learner empowerment through AI may become problematic when cognitive engagement and independent linguistic problem-solving are substantially reduced.

Institutional policy and instructional support demonstrated meaningful relationships with ethical adaptation. Universities implementing explicit AI literacy education and responsible technology guidelines reported stronger academic integrity awareness among students. Collaborative relationships between educators and learners regarding AI ethics therefore appeared to strengthen balanced and responsible engagement with generative language technologies.

A case study conducted at one participating university illustrated the evolving relationship between generative AI usage, learner autonomy, and academic integrity among second language learners. A second-year student enrolled in an academic English writing course initially used generative AI primarily for grammar correction and vocabulary support due to limited confidence in academic composition (Vissak & Torkkeli, 2025). Early reflective

journal entries indicated substantial anxiety regarding linguistic accuracy and fear of negative academic evaluation.

Progressive engagement with AI-assisted language tools contributed to significant improvement in writing performance and language confidence during the first half of the semester. The student reported increased willingness to participate in classroom discussion and greater independence in completing writing assignments. Automated feedback systems enabled immediate revision and reduced emotional frustration associated with repeated grammatical errors.

Dependence on AI-assisted composition gradually intensified during later stages of the semester. Reflective journal analysis revealed increasing reliance on AI-generated paragraph structures and argument development during complex academic assignments (Tran et al., 2025). The student subsequently reported uncertainty regarding the authenticity of personal language competence and expressed concern regarding diminished ability to produce independent academic writing without technological assistance.

Instructor feedback and participation in an institutional AI literacy workshop contributed to behavioral adjustment during the final observation phase. The student began limiting AI usage to revision support rather than complete content generation and demonstrated renewed confidence in independent drafting processes. Such behavioral transition illustrates the importance of ethical guidance and reflective educational support within AI-assisted language learning environments.

Case study findings suggest that generative AI influences learner autonomy through both empowering and dependency-forming mechanisms. Immediate access to personalized feedback and linguistic support initially strengthened learners' confidence, self-regulation, and willingness to engage independently with second language tasks (Tao et al., 2026). Such improvements likely emerged because AI systems reduced psychological barriers associated with linguistic uncertainty and academic anxiety.

Excessive technological reliance, however, appeared to reduce cognitive engagement during complex language production activities. Students increasingly dependent on AI-generated content demonstrated weaker confidence in authentic language creation and reduced motivation to engage in independent linguistic problem-solving. Such behavioral patterns suggest that learner autonomy supported by AI may gradually shift toward technological dependence when reflective educational boundaries are absent.

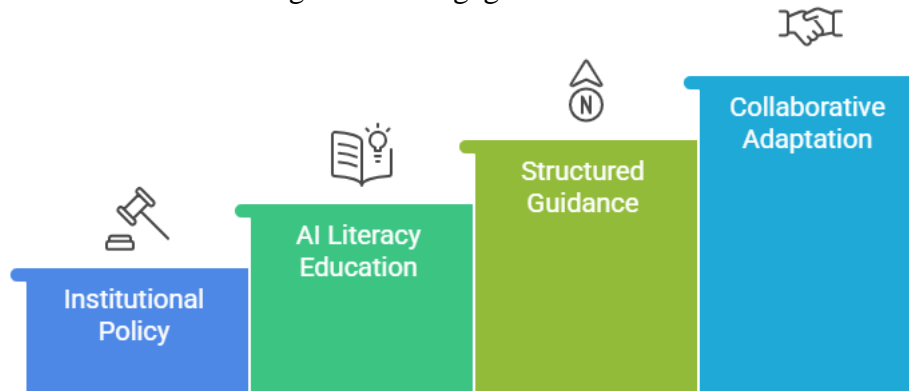
Institutional guidance significantly influenced students' ethical adaptation and AI usage behavior. Participants exposed to structured AI literacy instruction demonstrated stronger awareness regarding responsible technology engagement and maintained healthier balances between technological support and independent learning effort (Sajja et al., 2026). Educational intervention therefore appeared essential for preventing overdependence and preserving authentic language development processes.

Social and emotional dimensions additionally influenced learner interaction with generative AI systems. Students experiencing higher levels of language anxiety and academic insecurity demonstrated greater dependence on AI-assisted composition. Such findings indicate that emotional vulnerability and linguistic confidence play important roles in shaping how learners negotiate technological assistance and academic integrity within second language acquisition contexts.

The findings confirm that generative AI significantly influences learner autonomy and academic integrity within second language acquisition environments. AI-assisted learning systems contribute positively to language confidence, independent practice behavior, and academic writing performance by providing continuous personalized linguistic support and immediate feedback opportunities.

Longitudinal findings also demonstrate that excessive dependence on AI-generated content may weaken authentic language production and ethical academic awareness among

second language learners. Educational benefits associated with generative AI therefore coexist with substantial risks related to cognitive disengagement and reduced academic authenticity.



**Figure 2.** Achieving Responsible AI Integration

Institutional policy and AI literacy education emerged as critical moderating factors influencing responsible technology engagement. Structured educational guidance strengthened students' capacity to balance technological assistance with independent language learning processes and ethical academic conduct. Collaborative pedagogical adaptation therefore appears essential for sustaining healthy integration of generative AI within second language education.

Results collectively suggest that generative AI should not be viewed exclusively as either a pedagogical threat or an educational solution. Sustainable implementation requires balanced frameworks capable of democratizing language learning opportunities while simultaneously preserving learner autonomy, authentic linguistic development, and academic integrity within increasingly AI-mediated educational environments.

The findings of this study demonstrate that generative artificial intelligence significantly influences learner autonomy and academic integrity within second language acquisition environments. Students engaging frequently with AI-assisted language learning tools demonstrated stronger self-regulated learning behavior, higher language confidence, and improved academic writing performance compared to learners with limited AI usage. Immediate access to personalized feedback, grammar correction, and vocabulary support encouraged greater independent practice and reduced anxiety associated with second language production.

Longitudinal observation further revealed that generative AI contributes positively to democratizing language learning opportunities by providing continuous linguistic assistance beyond traditional classroom boundaries. Students lacking confidence in academic writing or access to individualized instructional feedback benefited substantially from AI-supported revision systems and conversational language tools. Improvements in writing coherence, lexical diversity, and grammatical accuracy indicate that generative AI functions as an effective supplementary learning resource within second language education.

Concerns regarding academic integrity and technological dependence also emerged prominently throughout the study. High-frequency AI users demonstrated lower awareness regarding ethical boundaries associated with AI-assisted academic production and stronger dependence on automated systems during complex writing tasks. Several participants expressed uncertainty regarding the distinction between legitimate educational support and inappropriate reliance on AI-generated content. Such findings indicate that educational empowerment through AI simultaneously introduces ethical vulnerability and cognitive dependency risks.

Institutional guidance and AI literacy education significantly influenced learner behavior and ethical adaptation. Students exposed to structured discussions regarding responsible AI

usage demonstrated stronger academic integrity awareness and healthier balances between technological support and independent learning effort. Collaborative educational environments emphasizing reflective engagement with AI tools therefore appeared essential for sustaining authentic language development and ethical academic conduct.

The findings align with previous studies emphasizing the educational potential of generative AI in language learning contexts. Earlier investigations demonstrated that AI-assisted writing systems improve grammatical accuracy, language fluency, and learner confidence by providing immediate personalized feedback. Results from this study support these observations while extending them through examination of learner autonomy and ethical academic behavior within authentic educational settings. Generative AI appears capable of strengthening independent learning opportunities for second language learners across diverse proficiency levels.

Comparisons with self-regulated learning research further reveal strong consistency regarding the relationship between personalized feedback and learner autonomy. Previous studies suggested that immediate corrective support strengthens students' willingness to engage independently with challenging linguistic tasks. Findings from the current study confirm that AI-generated feedback reduces psychological barriers associated with language anxiety and encourages continuous experimentation with complex language structures.

Differences emerge, however, regarding the long-term implications of technological dependence. Existing literature frequently emphasizes efficiency and accessibility benefits associated with AI-supported learning while giving limited attention to declining confidence in authentic language production resulting from excessive automation reliance. The present study demonstrates that overdependence on AI-generated composition may reduce cognitive engagement and weaken learners' trust in their independent linguistic abilities. Such findings challenge overly optimistic assumptions regarding unrestricted AI integration in second language education.

Distinctive contributions also appear in relation to academic integrity discourse. Previous research often framed AI-related academic dishonesty primarily as a plagiarism detection issue. Findings from this study suggest that ethical concerns extend beyond direct misconduct toward more subtle forms of cognitive outsourcing and diminished learner accountability. Such perspectives broaden understanding regarding how generative AI reshapes educational authenticity, learner responsibility, and institutional assessment practices within language acquisition contexts.

The findings signify that second language acquisition is entering a transformative educational phase in which technological mediation increasingly shapes learner behavior, cognitive engagement, and academic identity. Generative AI no longer functions merely as an external support tool but has become integrated into learners' daily language development processes. Such transformation suggests that educational systems must reconsider traditional assumptions regarding authorship, linguistic competence, and independent learning within digitally mediated environments.

The results also indicate that learner autonomy in AI-assisted contexts possesses a paradoxical character. Generative AI simultaneously empowers learners by expanding access to personalized feedback while potentially weakening authentic problem-solving engagement through excessive dependence on automated support. Autonomy therefore appears increasingly intertwined with learners' capacity to regulate technological assistance responsibly rather than simply demonstrating independent task completion without external support.

Longitudinal behavioral patterns further signify that academic integrity in contemporary education extends beyond detecting plagiarism toward fostering ethical digital literacy and reflective technological engagement. Students frequently struggled not because of intentional dishonesty but because of uncertainty regarding appropriate boundaries of AI-supported

learning. Educational institutions therefore face increasing responsibility to cultivate ethical awareness alongside technological competence.

The findings additionally signal broader democratization of language learning opportunities within global educational systems. Students previously disadvantaged by limited instructional access or linguistic insecurity gained substantial confidence and writing improvement through AI-supported learning environments. Generative AI therefore possesses capacity to reduce educational inequality while simultaneously creating new ethical and pedagogical complexities requiring careful institutional management.

The implications of these findings are substantial for second language curriculum development and instructional practice. Language education programs should integrate AI literacy education directly into academic instruction rather than treating generative AI as an external or prohibited technology. Students require explicit guidance regarding responsible AI usage, ethical academic conduct, and strategies for balancing technological support with authentic cognitive engagement during language learning activities.

Assessment design within second language education also requires substantial reconsideration. Traditional writing assignments may no longer adequately measure authentic learner competence within AI-mediated learning environments. Educators may therefore need to incorporate process-oriented assessment, reflective writing, oral performance tasks, and collaborative language activities capable of evaluating deeper communicative understanding beyond AI-assisted textual production.

Teacher preparation and professional development programs similarly require adaptation. Language instructors should receive training related to generative AI functionality, ethical implications, and pedagogical integration strategies to ensure informed instructional decision-making. Educators lacking understanding regarding AI-supported learning may struggle to provide balanced guidance or respond effectively to emerging academic integrity challenges.

Broader educational policy implications also emerge regarding equity and access within digital language learning ecosystems. Generative AI may reduce barriers associated with socioeconomic inequality, instructional scarcity, and linguistic anxiety by democratizing access to personalized language support. Institutions should therefore avoid simplistic prohibition approaches and instead develop balanced frameworks maximizing educational opportunity while protecting authentic learning processes and academic standards.

The findings occurred because generative AI systems provide immediate, adaptive, and individualized linguistic feedback that closely aligns with learners' cognitive and emotional needs during second language acquisition. Students experiencing uncertainty regarding grammar, vocabulary, or sentence organization received rapid assistance without fear of embarrassment or negative evaluation. Such psychological safety likely strengthened confidence and encouraged greater independent engagement with language learning tasks.

Technological accessibility and continuous availability also contributed substantially to increased learner autonomy. Unlike traditional classroom instruction constrained by time and instructor availability, generative AI systems offered unlimited opportunities for revision, experimentation, and language practice. Students therefore developed stronger self-regulated learning habits by interacting with AI tools outside formal instructional environments according to personal learning pace and preferences.

Academic integrity concerns emerged because generative AI blurred boundaries between educational assistance and automated content production. Students frequently interpreted AI-generated suggestions as supportive collaboration rather than potential threats to authentic learning. Lack of institutional guidance regarding ethical AI usage further intensified confusion regarding acceptable academic behavior and responsible technological engagement during language learning activities.

Emotional and psychological dimensions additionally influenced learner dependence on AI systems. Students with higher levels of language anxiety or lower confidence in academic

writing demonstrated stronger reliance on automated support due to fear of failure and social judgment. Generative AI therefore functioned not only as a linguistic tool but also as an emotional coping mechanism reducing stress associated with second language performance and evaluation.

Future research should investigate long-term effects of generative AI on authentic language competence development across diverse educational and cultural contexts. Longitudinal studies extending beyond single academic semesters may provide deeper understanding regarding whether AI-assisted learning ultimately strengthens or weakens independent communicative ability over extended periods of language acquisition. Comparative international investigations may also reveal how cultural attitudes toward technology influence learner autonomy and academic integrity adaptation.

Further investigation is needed regarding ethical pedagogical frameworks capable of balancing AI-supported accessibility with preservation of authentic learning processes. Research examining effective instructional strategies for teaching responsible AI engagement, reflective technological literacy, and cognitive independence may contribute substantially to sustainable educational adaptation within AI-mediated learning environments.

Technological innovation additionally presents opportunities for designing more educationally responsible generative AI systems. Future studies may explore AI tools explicitly developed to encourage metacognitive reflection, scaffolded learning, and gradual reduction of learner dependence rather than fully automated content generation. Human-centered AI design may therefore become increasingly important for preserving educational authenticity while maximizing accessibility benefits.

Educational institutions should move toward balanced policy frameworks recognizing generative AI as an inevitable component of contemporary language education rather than solely a disciplinary concern. Sustainable implementation requires collaboration among educators, students, policymakers, and technology developers to establish ethical standards supporting democratized learning opportunities, authentic language development, and responsible academic engagement within increasingly AI-integrated educational ecosystems.

## CONCLUSION

The most significant finding of this study is that generative artificial intelligence simultaneously strengthens learner autonomy and increases ethical vulnerability within second language acquisition environments. Students utilizing AI-assisted language learning tools demonstrated higher confidence, stronger self-regulated learning behavior, and improved academic writing performance due to continuous access to personalized linguistic feedback and revision support. Distinctive findings further revealed that excessive dependence on generative AI gradually reduced learners' confidence in authentic language production and weakened awareness regarding academic integrity boundaries. Such results indicate that generative AI functions not merely as a technological learning aid but as a transformative educational force capable of reshaping cognitive engagement, learner identity, and ethical academic behavior within language education contexts.

The study contributes conceptually and methodologically to the fields of second language acquisition, digital pedagogy, and educational ethics. Conceptually, the research introduces an integrated analytical framework positioning generative AI as both a democratizing educational resource and a potential challenge to authentic language development and academic integrity. Methodologically, the study combines quantitative analysis of learner autonomy and academic integrity with qualitative exploration of learner experiences, emotional adaptation, and ethical negotiation within AI-mediated learning environments. Longitudinal observation of AI-assisted learning behavior additionally provides deeper understanding regarding how technological

dependence evolves over time, offering a multidimensional perspective rarely addressed within previous SLA and educational technology research.

Several limitations should be acknowledged when interpreting the findings of this study. Participant selection was limited to university-level second language learners within digitally supported educational environments, potentially restricting generalizability across younger learners, rural institutions, or contexts with limited technological access. Observation periods were also confined to a single academic semester, limiting examination of long-term linguistic development and sustained ethical adaptation associated with generative AI usage. Dependence on self-reported learning behavior and academic integrity perception measures may further introduce subjective response bias despite triangulation with observation and writing analysis. Future research should therefore investigate broader cultural and institutional contexts, examine longitudinal effects of AI-assisted learning on authentic communicative competence, and explore development of pedagogical frameworks capable of balancing technological accessibility, learner autonomy, and ethical academic engagement within increasingly AI-mediated educational systems.

## **DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS**

During the preparation of this manuscript, the author(s) used Grammarly to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

## **AUTHOR CONTRIBUTIONS**

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

## **DECLARATION OF COMPETING INTEREST**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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