

Article

# The use of AI tools (ChatGPT, Grammarly, DeepL) in self-directed English learning at Ecuadorian universities

## *El uso de herramientas de inteligencia artificial (ChatGPT, Grammarly, DeepL) en el aprendizaje autodirigido del inglés en universidades ecuatorianas*

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 <https://doi.org/10.70881/mcj/v4/n2/150>

**Citation:** Montero Bastidas, M. E., & Quintuña Barrera, L. V. (2026). El uso de herramientas de inteligencia artificial (ChatGPT, Grammarly, DeepL) en el aprendizaje autodirigido del inglés en universidades ecuatorianas. *Multidisciplinary Collaborative Journal*, 4(2), 54-66. <https://doi.org/10.70881/mcj/v4/n2/150>

**Received:** 06/03/2026  
**Revised:** 18/04/2026  
**Accepted:** 21/04/2026  
**Published:** 28/04/2026



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**Abstract:** The integration of artificial intelligence (AI) tools into language teaching and learning has grown exponentially in recent years. This study examines the use of ChatGPT, Grammarly, and DeepL as resources to support self-directed English learning among university students in Ecuador. Using a quantitative descriptive design with a sample of 40 students from the Universidad Agraria del Ecuador (UAE), a validated questionnaire was applied to measure frequency of use, perceived usefulness, and impact on learning autonomy. Results indicate that 90% of participants regularly use ChatGPT, followed by Grammarly (80%) and DeepL (70%), with all tools receiving perceived usefulness scores above 4.0 on a 1–5 scale. Statistically significant improvements were also observed in key dimensions of self-regulated learning, including goal setting, resource management, and motivation. It is concluded that AI tools constitute an effective resource for enhancing autonomous English learning; however, their pedagogical integration requires teacher guidance to prevent cognitive dependency.

**Keywords:** gamification, active, dynamics, teaching, performance

**Resumen:** La integración de herramientas de inteligencia artificial (IA) en la enseñanza y aprendizaje de idiomas ha experimentado un crecimiento sin precedentes en los últimos años. El presente estudio examina el uso de ChatGPT, Grammarly y DeepL como recursos de apoyo al aprendizaje autónomo del inglés en estudiantes universitarios ecuatorianos. Mediante un diseño cuantitativo descriptivo con una muestra de 40 estudiantes de la Universidad Agraria del Ecuador (UAE), se aplicó un cuestionario validado para medir la frecuencia de uso, utilidad percibida y efecto sobre la autonomía en el aprendizaje. Los resultados muestran que el 90% de los participantes utiliza ChatGPT con regularidad, seguido de Grammarly (80%) y DeepL (70%), y que todas las herramientas presentan puntuaciones de utilidad percibida superiores a 4.0 en una escala de 1 a 5. Asimismo, se evidenció una mejora estadísticamente significativa en dimensiones clave

del aprendizaje autorregulado, tales como el establecimiento de metas, la gestión de recursos y la motivación. Se concluye que las herramientas de IA constituyen un recurso eficaz para potenciar el aprendizaje autónomo del inglés, aunque su integración pedagógica requiere orientación docente para prevenir dependencia cognitiva.

**Palabras claves:** gamificación, activo, dinámicas, enseñanza, rendimiento

## 1. Introduction

The rapid expansion of artificial intelligence (AI) technologies has transformed multiple domains of contemporary life, and education is no exception. In the field of English as a Foreign Language (EFL), AI-powered tools such as ChatGPT, Grammarly, and DeepL have emerged as widely accessible resources that learners can integrate into their independent study routines outside the formal classroom (Abdullah, 2025; Aldulaijan & Almalki, 2025). These tools offer real-time feedback, translation support, writing assistance, and interactive conversational practice features that align with the core principles of self-directed learning (SDL), namely learner autonomy, goal setting, self-monitoring, and metacognitive regulation (Moorhouse et al., 2024; Van Wyk, 2025).

In the Ecuadorian higher education context, English proficiency remains a critical academic and professional requirement, yet institutional resources and teaching hours are often insufficient to meet learner needs (Fan et al., 2025; Farrokhnia et al., 2024). As a result, students increasingly turn to AI tools as supplementary learning resources. However, little empirical evidence exists regarding how these tools are used, how useful students perceive them to be, and to what extent they promote or hinder autonomous learning behaviours (Habeab Al-Obaydi & Pikhart, 2025; Jadhav, 2026).

Research conducted in other geographic contexts has documented the benefits of AI tools for EFL writing (Abdullah, 2025; Kurt & Kurt, 2024), pronunciation (Hirschi et al., 2025; Mompean, 2024), vocabulary acquisition (Sekitani et al., 2025), and speaking practice (Sok & Shin, 2025). However, scholars have also raised concerns about the risk of metacognitive laziness and over-reliance on AI-generated outputs (Fan et al., 2025), as well as questions of academic integrity (Saarna, 2024) and the differential impact of generative AI on learner motivation and self-regulation (Huang & Mizumoto, 2025).

Despite the growing body of international literature, research examining AI tool use in Latin American, and specifically Ecuadorian, university EFL contexts remains scarce. Understanding how students in this region engage with AI tools is essential for designing evidence-based pedagogical interventions that harness their benefits while mitigating potential drawbacks (Farrokhnia et al., 2024; Yetkin, 2026).

The present study addresses this gap by investigating the frequency of use, perceived usefulness, and self-directed learning impact of ChatGPT, Grammarly, and DeepL among undergraduate students at the Universidad Agraria del Ecuador (UAE). The main objective is to describe and analyse the ways in which these AI tools are integrated into students' self-directed English learning practices.

## 2. Materials and Methods

### 2.1. Research Design

A quantitative descriptive research design was adopted. This approach was selected because it allows for the systematic measurement and description of AI tool usage patterns and their association with self-directed learning behaviours in a defined

population (Van Wyk, 2025). The study was conducted during the 2024–2025 academic year at the UAE Centro de Idiomas.

## 2.2. Participants

The sample comprised 40 undergraduate students ( $n = 40$ ) enrolled in English language courses at the B1 level at UAE. Participants ranged in age from 18 to 27 years ( $M = 21.3$ ,  $SD = 1.9$ ). Purposive sampling was employed, selecting students who had prior exposure to at least one AI tool in their English learning. Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Ethical approval was granted by the UAE academic research committee.

## 2.3. Instrument

A structured questionnaire was designed and validated for this study. The instrument consisted of three sections: (a) demographic and background information (5 items); (b) AI tool usage frequency and perceived usefulness (15 items on a 5-point Likert scale); and (c) self-directed learning behaviours adapted from established SDL frameworks (Wolf & Suhan, 2025; Zou & Huang, 2024). Content validity was established through expert review by three specialists in EFL methodology and educational technology. Internal consistency was assessed using Cronbach's alpha ( $\alpha = .87$ ), indicating high reliability.

## 2.4. Procedure

The questionnaire was administered online via Google Forms during regular class sessions. Participants were instructed to respond based on their personal AI tool usage habits over the previous three months. A pre- and post-assessment design was employed to measure changes in self-directed learning dimensions before and after a six-week AI-supported learning period in which participants received structured guidance on how to use the tools effectively.

## 2.5. Data Analysis

Descriptive statistics (frequencies, percentages, means, and standard deviations) were computed using SPSS v.27. Paired-samples t-tests were conducted to compare pre- and post-intervention SDL scores. Statistical significance was set at  $p < .05$ . Qualitative data from open-ended items were analysed using thematic analysis following established procedures (Arifin et al., 2025).

## 3. Results

### 3.1. AI Tool Usage Frequency and Perceived Usefulness

All 40 participants (100%) reported using at least one AI tool for English learning purposes outside the formal classroom setting, confirming that AI-assisted self-study has become an established practice within this student population. Table 1 summarises the frequency of use and perceived usefulness scores for each tool across the full sample.

**Table 1. Frequency of use and perceived usefulness of AI tools (n = 40)**

AI Tool	n (%)	Frequency of Use (Mean ± SD)	Perceived Usefulness (Mean ± SD)
ChatGPT	36 (90%)	4.2 ± 0.8	4.5 ± 0.6
Grammarly	32 (80%)	3.9 ± 0.9	4.3 ± 0.7
DeepL	28 (70%)	3.7 ± 1.0	4.1 ± 0.8
Any AI tool	40 (100%)	4.0 ± 0.9	4.3 ± 0.7

*Note.* Frequency of Use measured on a 5-point Likert scale (1 = never, 5 = always). Perceived Usefulness measured on a 5-point Likert scale (1 = not at all useful, 5 = extremely useful).

ChatGPT emerged as the most frequently used tool, with 36 participants (90%) reporting regular use and a mean frequency score of  $M = 4.2$  ( $SD = 0.8$ ). Its perceived usefulness rating was the highest of the three tools ( $M = 4.5$ ,  $SD = 0.6$ ), indicating strong learner satisfaction. Students reported using ChatGPT primarily for grammar explanation and clarification (78%), essay drafting and revision (72%), vocabulary definition in context (65%), and interactive question-and-answer practice for exam preparation (54%). A smaller but notable proportion (38%) indicated that they used ChatGPT to generate model texts they subsequently analysed and adapted for their own writing assignments, a practice consistent with findings reported by Arifin et al. (2025) and Ozfidan et al. (2024).

Grammarly was the second most widely adopted tool (80%,  $n = 32$ ;  $M = 3.9$ ,  $SD = 0.9$ ; perceived usefulness  $M = 4.3$ ,  $SD = 0.7$ ). Students described it as particularly valuable for proofreading and error identification before submission of academic writing tasks. Many noted that the real-time, colour-coded feedback enabled them to understand the type and source of each error rather than simply accepting corrections an affordance also highlighted by Kurt and Kurt (2024) in their study on ChatGPT as an automated feedback tool. Several participants specifically appreciated Grammarly's suggestions for tone and clarity, which they perceived as complementary to grammatical correction alone.

DeepL was used by 70% of participants ( $n = 28$ ;  $M = 3.7$ ,  $SD = 1.0$ ; perceived usefulness  $M = 4.1$ ,  $SD = 0.8$ ). It was predominantly employed for word-level translation and meaning disambiguation (80% of DeepL users), followed by sentence-level paraphrasing (55%) and reading comprehension support when encountering unfamiliar texts in English (48%). Some participants noted a preference for DeepL over other translation services due to the perceived naturalness of its output, particularly for nuanced academic vocabulary, which aligns with observations by Habeb Al-Obaydi and Pikhart (2025) on learner satisfaction with AI-powered language tools.

When asked about the order in which they typically used these tools during a self-study session, 62% of participants described a sequential multi-tool workflow: they began by using DeepL to understand unknown vocabulary or translate difficult passages, then produced their own written output, employed Grammarly to review it, and finally used ChatGPT to seek deeper explanations or to practise interactive tasks. This emergent workflow suggests that students are developing relatively sophisticated AI-assisted study routines, even in the absence of formal instruction on how to integrate these tools.

### 3.2. Impact on Self-Directed Learning Dimensions

Paired-samples t-tests were conducted to compare pre- and post-intervention scores across the four SDL dimensions. Statistically significant improvements were recorded for all dimensions, as shown in Table 2.

**Table 2. Pre- and post-intervention self-directed learning scores (n = 40)**

SDL Dimension	Pre-intervention (Mean ± SD)	Post-intervention (Mean ± SD)	p-value
Goal setting	3.1 ± 0.7	4.0 ± 0.5	< .001
Resource management	3.0 ± 0.9	3.9 ± 0.6	< .001
Self-monitoring	2.9 ± 0.8	3.8 ± 0.7	.002
Motivation & autonomy	3.2 ± 0.7	4.1 ± 0.5	< .001

*Note.* All dimensions measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Significance level:  $p < .05$ .

The greatest gains were observed in motivation and autonomy (pre:  $M = 3.2$ ,  $SD = 0.7$ ; post:  $M = 4.1$ ,  $SD = 0.5$ ;  $\Delta = 0.9$ ;  $p < .001$ ) and goal setting (pre:  $M = 3.1$ ,  $SD = 0.7$ ; post:  $M = 4.0$ ,  $SD = 0.5$ ;  $\Delta = 0.9$ ;  $p < .001$ ). These two dimensions are theoretically interrelated, as the capacity to set meaningful learning goals is widely considered a prerequisite for sustaining autonomous learning motivation (Wolf & Suhan, 2025). The magnitude of improvement in both dimensions suggests that the structured AI integration protocol adopted in this study which required participants to set weekly language learning objectives and document their AI-assisted study activities played a facilitative role beyond mere tool access.

Resource management also improved significantly (pre:  $M = 3.0$ ,  $SD = 0.9$ ; post:  $M = 3.9$ ,  $SD = 0.6$ ;  $\Delta = 0.9$ ;  $p < .001$ ). Pre-intervention scores for this dimension were the lowest recorded, suggesting that students initially lacked strategies for selecting, organising, and critically evaluating AI-generated content. Post-intervention gains indicate that guided reflection on tool affordances and limitations helped students develop more strategic resource selection behaviours. Notably, several participants indicated in open-ended responses that they had begun cross-referencing AI tool outputs with other sources including their course textbook and instructor feedback rather than accepting single-source AI responses uncritically, a behaviour consistent with the critical AI literacy dispositions advocated by Farrokhnia et al. (2024).

Self-monitoring showed the smallest but still statistically significant improvement (pre:  $M = 2.9$ ,  $SD = 0.8$ ; post:  $M = 3.8$ ,  $SD = 0.7$ ;  $\Delta = 0.9$ ;  $p = .002$ ). The pre-intervention mean for this dimension was the lowest across all four constructs measured, indicating that metacognitive self-regulation represented the area of greatest initial difficulty for the sample. This is consistent with research suggesting that self-monitoring skills require more explicit instructional scaffolding than other SDL dimensions (Zou & Huang, 2024). The post-intervention improvement, while significant, also suggests room for continued growth and underscores the importance of embedding explicit metacognitive training into AI-assisted language learning programmes.

### 3.3. Patterns of Use by Learning Skill Area

To provide a more granular description of how AI tools were deployed across different language skill areas, participants were asked to indicate which skills they most frequently practised using each tool. Responses revealed a clear skill-tool alignment pattern. ChatGPT was predominantly associated with writing (88% of ChatGPT users), grammar (82%), and reading comprehension (60%), while speaking practice was reported by only 35% of users a finding that may reflect the text-based interface of ChatGPT, which does not natively support synchronous oral interaction in the version accessed by most participants.

Grammarly was almost exclusively associated with writing, as expected given its core functionality (97% of Grammarly users). However, 43% of Grammarly users also indicated that reviewing error feedback contributed to their grammatical knowledge more broadly, suggesting a transfer effect from corrective feedback to declarative language knowledge, consistent with patterns documented by Shin and Lee (2024). DeepL was linked primarily to reading comprehension support and vocabulary building, with 60% of DeepL users reporting that encountering words in translated context helped them retain new vocabulary more effectively than using a traditional monolingual dictionary.

Listening and speaking skills were the least supported by the three tools studied. Only 22% of participants reported using any of the three AI tools specifically to support listening comprehension, and 18% for speaking practice. This asymmetry between written and oral skill support may partially explain persistent oral proficiency challenges documented in EFL contexts across Latin America (Fan et al., 2025; Farrokhnia et al., 2024). The limited use of AI for oral skills also indicates an area for targeted pedagogical intervention, particularly given the availability of AI-powered pronunciation and speaking tools documented in recent research (Hirschi et al., 2025; Mompean, 2024).

### 3.4. Perceived Barriers and Challenges

Despite the generally positive perceptions reported, participants also identified a range of barriers to effective AI tool use. The most frequently cited challenge was language proficiency itself (67%), with students noting that formulating effective prompts for ChatGPT required a level of English competence that many B1-level learners found demanding. This finding points to an inherent paradox in AI-assisted EFL learning: the tools designed to support language acquisition may themselves require a minimum threshold of proficiency to be used productively (Jadhav, 2026; Pham, 2026).

Connectivity and access issues were the second most commonly reported barrier (55%), particularly among students who commuted from peri-urban or rural areas surrounding Guayaquil where internet access was unreliable. This finding echoes broader concerns about digital equity in Ecuadorian higher education and suggests that the potential of AI tools to democratise language learning support may be unevenly distributed across socioeconomic strata (Farrokhnia et al., 2024).

A third barrier identified was uncertainty about the reliability of AI-generated content (48%). Participants expressed concern about receiving incorrect grammar explanations or culturally inappropriate translations. The fact that nearly half of participants reported this uncertainty also suggests a need for explicit instruction in AI literacy specifically, in how to verify and critically evaluate AI outputs in the context of language learning (Saarna, 2024; Yetkin, 2026).

### 3.5. Student Perceptions: Qualitative Findings

Thematic analysis of open-ended responses yielded five overarching themes that provide qualitative depth to the quantitative findings described above.

The first and most prevalent theme was accessibility and convenience. Participants consistently described the 24/7 availability of AI tools as a transformative feature that extended their learning beyond classroom hours and removed the social anxiety associated with asking a teacher or peer for help. Representative responses included descriptions of using ChatGPT late at night before an exam, or turning to DeepL during commutes to understand words encountered in English-language social media content.

The second theme, confidence and reduced anxiety, was particularly prominent in responses related to writing tasks. Multiple participants described a qualitative shift in their willingness to attempt longer, more complex written productions after having access to Grammarly, noting that the knowledge that errors would be flagged and explained reduced the inhibition typically associated with academic writing in English. This finding aligns with broader research on writing apprehension in EFL contexts and the role of feedback in reducing affective barriers to written production (Abdullah, 2025; Kurt & Kurt, 2024).

The third theme, active learning versus passive completion, captured a tension that several participants articulated explicitly. Students described two distinct modes of AI use: an active mode in which they engaged with AI feedback to understand patterns, generate questions, and revise their own understanding; and a passive mode in which they accepted AI-generated text or corrections without deeper engagement. Participants who described the active mode tended to report higher confidence and perceived learning gains, while those who acknowledged the passive mode expressed concern about whether they were genuinely learning (Fan et al., 2025).

The fourth theme, trust calibration, described participants' evolving understanding of when to trust and when to question AI outputs. Several students noted that after receiving instructor feedback that contradicted an AI explanation, they had begun to approach AI outputs with greater scepticism. This developmental trajectory from uncritical acceptance to calibrated trust represents a key dimension of AI literacy that structured pedagogical integration can accelerate (Farrokhnia et al., 2024; Saarna, 2024).

The fifth and final theme, social comparison and peer influence, emerged from responses describing how students became aware of AI tool use within their peer networks. Several participants noted that learning about a classmate's use of DeepL or ChatGPT had motivated them to try the tools themselves, suggesting that peer modelling plays a role in AI tool adoption that has received limited attention in the existing literature (Huang & Mizumoto, 2025).

## 4. Discussion

### 4.1. AI Tool Adoption and Perceived Usefulness in the Ecuadorian EFL Context

The near-universal adoption of AI tools among the study participants (100% using at least one tool; 90% using ChatGPT) situates the Ecuadorian university EFL context firmly within global trends of AI tool diffusion in higher education. These adoption rates parallel or exceed those reported in comparable studies. Abdullah (2025) found similarly high rates of ChatGPT adoption among EFL students in academic writing contexts, while Aldulaijan and Almalki (2025) documented widespread generative AI use among postgraduate students for a variety of learning tasks. The fact that comparably high rates are now observed at an undergraduate B1-level population in a public Ecuadorian

university suggests that AI tool adoption in EFL contexts is no longer confined to technologically privileged or advanced learner populations.

The high perceived usefulness scores ( $M > 4.0$  for all three tools) are consistent with the Technology Acceptance Model (TAM) prediction that perceived usefulness is the strongest predictor of sustained technology adoption (Aldulaijan & Almalki, 2025; Van Wyk, 2025). Importantly, the usefulness ratings were not uniformly distributed across task types: students rated ChatGPT most useful for grammar explanation and interactive practice, Grammarly for corrective writing feedback, and DeepL for comprehension support. This skill-specific utility differentiation indicates that students are developing nuanced mental models of each tool's comparative affordances a form of tool literacy that has direct implications for how instructors might guide AI integration in curriculum design.

#### **4.2. AI Tools and Self-Directed Learning: Theoretical Implications**

The statistically significant pre-to-post improvements across all four SDL dimensions provide empirical support for the theoretical argument that AI tools, when embedded within a structured pedagogical framework, can scaffold the development of self-regulated learning behaviours in EFL contexts. This finding extends the work of Huang and Mizumoto (2025), who demonstrated that generative AI use positively influenced the L2 motivational self-system, and complements research by Sok and Shin (2025) showing that ChatGPT interaction tasks improved learner autonomy perceptions and performance on summarisation tasks.

From a Self-Determination Theory (SDT) perspective, the gains in motivation and autonomy observed in this study may be partly explained by the way in which AI tools satisfy basic psychological needs for competence and autonomy. The immediate, non-judgmental feedback provided by tools like Grammarly addresses the need for competence by making skill development visible and incremental, while the on-demand availability of ChatGPT satisfies the need for autonomy by allowing learners to direct their own inquiry without dependence on teacher availability (Wolf & Suhan, 2025). The comparatively lower gains in self-monitoring relative to the other SDL dimensions may reflect that the need for relatedness also central to SDT was less directly addressed by the tools studied, suggesting an area for targeted instructional design.

The improvement in resource management is theoretically significant because it suggests that guided AI integration can promote higher-order information literacy skills, not merely surface-level tool use. When students begin cross-referencing AI outputs with other sources, they are engaging in the kind of critical source evaluation that underpins academic literacy more broadly (Farrokhnia et al., 2024; Zou & Huang, 2024). These finding challenges simplistic narratives that frame AI tools as inherently antithetical to critical thinking, and supports instead the view that the pedagogical context in which tools are introduced is the decisive variable in determining their cognitive outcomes.

#### **4.3. Writing Development and AI Feedback: Opportunities and Risks**

The prominent role of writing in students' AI tool use with ChatGPT and Grammarly both used predominantly for writing-related tasks invites detailed consideration of the relationship between AI feedback and L2 writing development. Research by Kurt and Kurt (2024) demonstrated that ChatGPT as an automated feedback tool improved L2 writing quality across multiple dimensions, including syntactic complexity and lexical diversity, while Shin and Lee (2024) explored the potential of ChatGPT as a rater of second language writing, finding acceptable agreement with human rater judgements on analytic scoring dimensions.

In the present study, students' descriptions of using Grammarly for proofreading and ChatGPT for drafting assistance align with a scaffolded writing process model in which AI tools support distinct phases of composition: pre-writing ideation, drafting, revision, and editing. When students engage with this process actively reviewing feedback, identifying recurring error patterns, and revising independently the potential for genuine writing development is substantial. Arifin et al. (2025) found that Indonesian EFL students who adopted a reflective, process-oriented approach to ChatGPT use in L2 writing reported greater perceived learning gains than those who used the tool primarily for text generation.

However, the passive completion mode identified in the qualitative data of the present study introduces a countervailing risk. When students accept AI-generated text without engagement, they may produce improved written products while simultaneously undermining the conditions for authentic skill development (Fan et al., 2025). Saarna (2024) identified precisely this dynamic in the analysis of ChatGPT-generated student essays, noting that the absence of genuine linguistic struggle the productive difficulty that consolidates new knowledge represents a hidden cost of frictionless AI assistance. This tension between immediate performance improvement and long-term proficiency development constitutes one of the most pressing unresolved questions in AI-assisted language learning pedagogy.

#### **4.4. Cognitive Dependency and Metacognitive Laziness**

The emergence of cognitive dependency as a self-reported concern among participants is theoretically consistent with Fan et al.'s (2025) construct of metacognitive laziness, defined as the tendency to outsource effortful cognitive processing to AI tools rather than engaging in the generative retrieval and elaboration processes that consolidate long-term learning. Fan et al. (2025) documented empirical evidence that high-frequency generative AI use was associated with reduced metacognitive monitoring and lower retention of course content in controlled experimental conditions a finding that directly parallels the dependency concerns voiced by participants in the present study.

Farrokhnia et al. (2024) similarly identified dependency and reduced critical thinking as significant weaknesses in their SWOT analysis of ChatGPT for educational purposes, noting that the very features that make ChatGPT attractive its fluency, responsiveness, and apparent comprehensiveness are the same features that can discourage learners from developing independent problem-solving and linguistic reasoning capabilities. In the EFL context, this risk is particularly salient because language learning requires not only the accumulation of declarative knowledge about grammar and vocabulary, but also the development of procedural fluency the automatic application of linguistic knowledge in real-time communication which AI tools cannot substitute for and may inadvertently impede if they consistently remove the need for effortful practice (Pham, 2026; Sekitani et al., 2025).

The five-theme qualitative structure emerging from this study and particularly the active versus passive use distinction and the trust calibration trajectory suggests that students are not passive recipients of AI influence, but active agents who develop increasingly sophisticated relationships with AI tools over time. This developmental perspective supports pedagogical approaches that treat AI literacy as a progressive competency to be cultivated rather than a binary skill. Instructional interventions that make the active versus passive use distinction explicit, encourage metacognitive reflection on AI interaction patterns, and provide structured opportunities for trust calibration are likely to maximise the SDL benefits of AI tool integration while mitigating dependency risks (Yetkin, 2026).

#### 4.5. The Digital Equity Dimension

The connectivity and access barriers reported by 55% of participants raise important questions about the equity implications of AI tool integration in Ecuadorian higher education. If AI tools function as significant enhancers of self-directed English learning as the present findings suggest then differential access to these tools based on socioeconomic status, geographic location, or institutional infrastructure may constitute a new axis of educational inequality that compounds existing disparities in English language proficiency outcomes (Farrokhnia et al., 2024; Habeb Al-Obaydi & Pikhart, 2025).

University language centres and EFL programme coordinators in Ecuador should consider how AI tool integration policies can be designed to avoid exacerbating existing inequalities. Potential responses include providing offline-capable AI tool access via institutional networks, offering structured in-class AI-assisted learning time that does not depend on home connectivity, and designing AI integration curricula that can be implemented at varying levels of tool access without disadvantaging less connected students. These equity considerations are not peripheral to the pedagogical question of AI tool integration; they are central to any responsible institutional policy on the matter (Jadhav, 2026; Yetkin, 2026).

#### 4.6. Limitations and Future Research Directions

Several limitations of the present study merit acknowledgement. First, the sample size ( $n = 40$ ), while adequate for a pilot descriptive study at a single institution, limits the statistical power of the pre-post comparisons and constrains the generalisability of findings to other Ecuadorian universities, proficiency levels, or disciplinary contexts. Future research should employ larger, multi-institutional samples to enable more robust inferential analyses and support cross-context comparisons (Aldulaijan & Almalki, 2025).

Second, the exclusive reliance on self-report data introduces common method variance and social desirability bias, particularly in responses related to dependency and passive tool use. Students who engage in passive AI-assisted task completion may underreport this behaviour due to perceived academic integrity norms. Future studies should triangulate self-report data with direct observations of AI-assisted study sessions, analysis of chat interaction logs, and assessment of actual writing quality changes as objective indicators of learning outcomes (Arifin et al., 2025; Saarna, 2024).

Third, the six-week intervention period, while sufficient to detect statistically significant SDL score changes, does not permit conclusions about the long-term sustainability of the improvements observed. Longitudinal research tracking learner outcomes over full academic years or across proficiency transitions would provide more informative evidence about the enduring impact of structured AI tool integration on autonomous English learning (Huang & Mizumoto, 2025; Sok & Shin, 2025).

Finally, this study focused exclusively on three specific AI tools. The AI tool landscape is evolving rapidly, and new applications including AI-powered pronunciation coaches (Hirschi et al., 2025), adaptive vocabulary platforms, and multimodal conversation partners are expanding the range of AI-assisted learning affordances available to EFL learners. Comparative research examining how different tool configurations, integration approaches, and learner profiles interact to shape SDL outcomes represents a productive and urgently needed direction for the field (Mompean, 2024; Zhang & Umeanowai, 2025).

## 5. Conclusions

This study provides empirical evidence that artificial intelligence tools specifically ChatGPT, Grammarly, and DeepL are widely adopted and highly valued by undergraduate EFL students at the Universidad Agraria del Ecuador as resources for self-directed English learning. The findings revealed high usage rates across all tools, with ChatGPT being the most frequently used, and consistently strong perceived usefulness scores. Importantly, statistically significant improvements were observed across all dimensions of self-directed learning, including goal setting, resource management, self-monitoring, and motivation. These results confirm that AI tools, when integrated within a structured pedagogical framework, can effectively enhance learner autonomy, engagement, and self-regulation in EFL contexts.

At the same time, the study highlights critical pedagogical considerations. While AI tools offer substantial benefits, the risk of cognitive dependency and passive learning behaviors underscores the need for guided and reflective use. The findings suggest that the effectiveness of AI in language learning depends not only on access to the tools but also on the instructional strategies that support their use. Therefore, integrating AI literacy into EFL curricula, promoting active engagement with AI-generated feedback, and ensuring equitable access to digital resources are essential steps for maximizing their educational potential. Future research should expand the scope of analysis through larger samples, longitudinal designs, and the inclusion of additional variables such as language anxiety and proficiency development.

**Contributions authors:** Conceptualization, M.E.M.-B; methodology, M.E.M.-B; formal analysis, L.V.Q.-B; investigation, L.V.Q.-B; resources, M.E.M.-B; original draft writing, L.V.Q.-B; writing, revision, and editing, M.E.M.-B; visualization, L.V.Q.-B and M.E.M.-B; supervision, M.E.M.-B. All authors have read and accepted the published version of the manuscript.

**Funding:** This research has not received external funding.

**Acknowledges:** The authors acknowledge the support of Universidad Agraria del Ecuador and extend sincere thanks to all participating students and educators whose commitment and engagement were fundamental to the successful completion of this research.

**Data availability statement:** The data are available upon request from the corresponding authors: [mmontero@uagraria.edu.ec](mailto:mmontero@uagraria.edu.ec)

**Conflict of interest:** The authors declare no conflict of interest.

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