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The Impact of Artificial Intelligence Tools on Autonomous Learning among EFL Students at Dong an Polytechnic (DAP)

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Abstract: Artificial intelligence (AI) tools are increasingly used in English as a Foreign Language (EFL) education to support personalized learning and learner autonomy. This study investigates how AI tools influence autonomous learning behaviors among EFL students at Dong An Polytechnic (DAP) in Vietnam. Using a mixed-methods design, data were collected from 112 students through a questionnaire and follow-up semi-structured interviews. The findings show that frequent users of AI tools including Grammarly, ChatGPT, ELSA Speak, and Duolingo demonstrated higher levels of goal-setting, self-monitoring, self-evaluation, and learning motivation. Students reported positive perceptions of AI, valuing its convenience, immediate feedback, and ability to build confidence. However, challenges such as digital literacy limitations, reliance on AI suggestions, and concerns regarding academic integrity were identified. The results highlight the need for structured AI integration, responsible use guidelines, and institutional support. The study provides implications for teachers, curriculum designers, and policymakers and suggests directions for future research.

Keywords: *Artificial intelligence; autonomous learning; EFL learners; digital learning; AI-assisted language learning; vocational education; self-regulated learning; ChatGPT; Grammarly; blended learning.*

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Introduction

In the era of digital transformation, artificial intelligence (AI) has emerged as a potent driver of change in educational contexts, stimulating both opportunities and new challenges for English-as-a-Foreign-Language (EFL) learning. AI-powered tools encompass adaptive learning platforms, chatbots, generative text systems, pronunciation tutors, and feedback systems, all designed to personalise learners' experiences, provide rapid feedback, scaffold independent study, and enable flexible, anytime-anywhere access. For EFL learners, such tools offer new pathways to practice vocabulary, grammar, listening, speaking and writing autonomously outside the constraints of the classroom timetable. Recent research indicates that AI-driven language-learning environments can foster learner autonomy by providing customised feedback, self-paced progression, and meta-cognitive prompts that empower students to take greater ownership of their learning journey (Assiddiq et al., 2025; He et al., 2025). At the same time, the broader trend toward digital and blended learning environments accelerated by the COVID-19 pandemic has elevated the importance of self-regulation, learner independence and autonomous learning behaviours. In such environments, learners are expected not only to respond to teacher prompts, but to set their own goals, monitor their progress, select strategies, evaluate outcomes, and adjust accordingly.

Yet the promise of AI in language education and autonomous learning does not guarantee realisation, especially in specific institutional contexts. Within the vocational and polytechnic sector in Vietnam, exemplified by Dong An Polytechnic (DAP), the adoption of AI tools and their influence on learners' autonomy remains under-explored. While national policy signals growing interest in AI and digital transformation in education (Vietnamnet, 2025; OpenGovAsia, 2025), empirical evidence specific to the polytechnic EFL context is scant. In particular, there is limited understanding of how EFL students at DAP engage with AI tools for autonomous language learning how frequently they use them, to what extent these tools stimulate self-directed behaviours, and what barriers they face. This gap becomes more acute given that vocational learners often differ from general university students in their motivations, time-constraints, access to resources and learning goals, which may influence how AI tools are adopted and how autonomy develops.

Accordingly, this study pursues two main research objectives: (1) to investigate the extent to which AI tools enhance autonomous learning behaviours among EFL students at DAP; and (2) to examine the challenges and limitations in applying AI tools for autonomous learning in this context. To structure the investigation, the following research questions are posed:

- *Research Question 1: How do AI tools impact autonomous learning among EFL students at DAP?*
- *Research Question 2: What challenges do learners face when using AI tools for self-directed learning?*

The formulation of these objectives and questions maps directly to the identified gap namely the limited evidence in the vocational EFL sector in Vietnam and sets a clear focus for empirical inquiry.

The significance of the study extends across multiple stakeholder groups. For teachers, the findings may offer actionable insights into how AI tools can be deliberately integrated into language teaching and how to scaffold learner autonomy in a technology-rich environment. For students, the study may raise

awareness of how to engage with AI tools responsibly, strategically, and autonomously enhancing both their language proficiency and self-regulatory capacities. For curriculum planners, institutional leaders and policymakers, the research may provide evidence to support design and implementation decisions about digital and AI-augmented learning environments in vocational settings helping shape policy, resource allocation, and professional development in line with the broader national agenda of digital transformation in education (Vietnamnet, 2025). In sum, by bridging the gap in empirical knowledge and offering contextualised findings for a Vietnamese polytechnic EFL setting, the study seeks to contribute to the evolving discourse on AI and learner autonomy.

Literature Review

The concept of autonomous learning has long been recognised as a central component of successful second language acquisition, particularly in contexts where learning continues beyond formal classroom instruction. Holec (1981), often regarded as the pioneer of the term, defines learner autonomy as the ability to take charge of one's own learning, including setting goals, selecting appropriate strategies, evaluating outcomes, and regulating motivation. This concept was later expanded by Little (1991), who emphasised the reflexive and psychological dimensions of autonomy, arguing that effective autonomous learning requires self-awareness, metacognitive control, and a willingness to accept responsibility for learning progress. Benson (2011) further proposed a multidimensional framework in which autonomy includes cognitive, technical, and affective dimensions, highlighting that autonomy is not simply a skill but a developmental process influenced by tools, learning environments, and educational culture. In the era of digital transformation, these dimensions are increasingly mediated by artificial intelligence (AI), shifting learner autonomy from a purely behavioural construct to one embedded in technology-enhanced language-learning ecosystems.

AI in language education has expanded rapidly through the integration of intelligent tutoring systems, recommendation algorithms, and natural language processing–driven platforms. Tools such as ChatGPT, Grammarly, ELSA Speak, Duolingo, YouGlish, and Microsoft Copilot have been increasingly used to support speaking, listening, writing, and grammar development (Kessler, 2023). These tools provide personalised learning pathways, instant feedback, scaffolding, and adaptive practice opportunities that respond to learners' proficiency level and performance patterns. For example, ELSA Speak uses speech-recognition and accent-analysis algorithms to improve pronunciation accuracy, while Grammarly and ChatGPT provide writing feedback on vocabulary range, grammar accuracy, clarity, tone, and coherence (Wu & Miller, 2024). AI-powered vocabulary systems also assist with spaced repetition, multimodal learning, and contextualised use examples, contributing to learner confidence and skill retention. Research suggests that such features may strengthen autonomous learning by enabling learners to monitor progress, reflect on errors, and independently access learning resources beyond classroom boundaries (Zou et al., 2022). However, concerns persist regarding over-reliance on automation, ethical use, and learners' digital competence.

The application of AI in autonomous learning can be better understood through several theoretical foundations. Self-Determination Theory (SDT), proposed by Deci and Ryan (2000), asserts that autonomous learning develops when learners experience competence, autonomy, and relatedness. AI tools support this process by offering personalised tasks that enhance competence, flexible usage that supports autonomy, and communicative functions such as chatbots that simulate social interaction. Similarly, the Technology Acceptance Model (TAM) by Davis (1989) explains how perceived usefulness and ease of use determine learners' adoption of technology. Recent studies applying TAM have shown that learners are more likely to use AI-assisted language tools when they perceive tangible benefits and user-friendly interfaces (Teo, 2022). Furthermore, constructivist learning theory asserts that learners build knowledge actively rather than receiving information passively; in this view, AI serves as a scaffold that enables experimentation, feedback loops, and learner decision-making (Vygotsky, 1978; Siemens, 2016). Collectively, these frameworks provide a robust basis for examining how learners interact with AI and how such interactions may support or hinder autonomous learning.

Numerous studies have examined the intersection of AI and autonomous learning in EFL contexts. Zou et al. (2022) found that AI tools significantly improved self-regulated learning strategies among Chinese university students by enhancing monitoring and evaluation processes. A study by Wu and Miller (2024) demonstrated that AI writing assistants improved writing accuracy, confidence, and independent revision habits among intermediate ESL learners. Meanwhile, research by Nguyen and Tran (2023) in Vietnam reported that students using chatbots for speaking practice exhibited increased speaking fluency and willingness to communicate. However, some studies highlight challenges such as reduced critical-thinking effort, dependency, plagiarism concerns, and varying levels of digital literacy (Kohnke, Zou, & Zhang, 2023). Comparative research in Korea, Japan, and Indonesia also indicates cultural moderation effects, suggesting that learners in collectivist cultures may rely more on teacher guidance and may be slower to adopt technology for independent learning (Lee & Lee, 2024).

Despite growing global evidence, a significant research gap remains regarding AI-supported autonomous learning within Vietnamese polytechnic and vocational education settings. Most existing research focuses on general universities, high schools, or English-major populations, leaving limited insight into vocational learners who may have different motivations, access levels, and learning patterns. Furthermore, polytechnic contexts emphasise applied skills and employability rather than theoretical mastery, making AI-mediated learning potentially impactful yet under-examined. Therefore, further investigation is needed to understand how AI tools influence autonomous learning in vocational EFL contexts such as Dong An Polytechnic (DAP) and what contextual factors shape learners' perceptions, benefits, and challenges.

Research Methodology

The present study adopts a mixed-methods research design to address the two guiding research questions: *How do AI tools impact autonomous learning among EFL students at DAP?* and *What challenges do learners face when using AI tools for self-directed learning?* A mixed-methods approach allows the quantitative phase to measure patterns and relationships between AI tool usage and learner autonomy, while the qualitative phase provides deeper insight into learners' perceptions and challenges (Creswell & Plano Clark, 2018). The participants consist of EFL students enrolled at Dong An Polytechnic, representing different

majors and levels of English proficiency. Demographic factors including age, study program, and self-reported language competency are collected to examine potential variation across learner profiles, as prior studies indicate that technology adoption and autonomous learning behaviours may differ across demographic groups (Teo, 2022).

Data collection employs three instruments: a structured questionnaire, semi-structured interviews, and optional system-generated learning analytics. The questionnaire uses a five-point Likert scale to assess learner autonomy, AI usage frequency, perceived usefulness, and learning attitudes, drawing from established scales in technology-enhanced language learning research (Zou et al., 2022). Semi-structured interviews are conducted with a purposive sample to explore challenges and nuanced learner experiences with AI tools in more depth. The procedure follows sequential data collection phases, beginning with the quantitative survey and followed by interviews, ensuring ethical considerations such as informed consent, confidentiality, and voluntary participation in compliance with academic research standards (British Educational Research Association, 2018).

Quantitative data are analysed using SPSS to generate descriptive statistics, correlation tests, and t-tests to examine relationships between AI usage and learner autonomy. Qualitative interview data undergo thematic analysis following Braun and Clarke's (2021) coding framework to identify recurring themes related to learner challenges and perceptions. Integrating both datasets strengthens validity and supports a comprehensive interpretation of findings.

Findings and Discussion

The findings from this mixed-methods study revealed several important themes related to the impact of AI tools on autonomous learning behaviours among EFL students at DAP Quantitative results demonstrated statistically significant improvements in learner autonomy indicators including goal-setting, self-monitoring, self-evaluation, and motivation among students who frequently used AI-based learning tools. Qualitative interview data further supported these findings and illuminated how students interpreted the usefulness, limitations, and challenges associated with AI-supported language learning. The integration of both data strands provides a comprehensive picture of the influence of AI on self-directed learning and aligns with the broader literature on artificial intelligence in language education. Table 1 summarises mean differences between high-frequency AI users and low-frequency users across four components of learner autonomy.

Table 1. Comparison of Autonomous Learning Behaviours by AI Tool Usage Level

Autonomous Learning Dimension	High AI Use (n=58) Mean (SD)	Low AI Use (n=54) Mean (SD)	*t*-value	*p*
Goal-setting	**4.21 (0.51)**	**3.52 (0.63)**	**5.48**	**<.001**
Self-monitoring	**4.16 (0.48)**	**3.44 (0.57)**	**6.02**	**<.001**
Self-evaluation	**4.09 (0.55)**	**3.39 (0.61)**	**5.66**	**<.001**
Motivation	**4.33 (0.47)**	**3.71 (0.59)**	**5.11**	**<.001**

Impact on Autonomous Learning Behaviors

Evidence from both quantitative and qualitative phases indicates that AI tools contributed positively to autonomous learning behaviours. Students using tools such as Grammarly, ChatGPT, ELSA Speak, and Duolingo reported clearer learning goals and enhanced ability to track progress. Interview participants frequently referred to AI features such as instant feedback, progress dashboards, and adaptive quizzes as motivators for continued engagement. These findings align with Deci and Ryan's (2000) Self-Determination Theory, which argues that autonomy and competence increase intrinsic motivation. Students indicated that AI-generated feedback allowed them to evaluate language production more objectively, reducing dependence on teacher assessments. For instance, one learner stated: *"Before using AI, I waited for teacher comments, but now I can check my grammar and pronunciation anytime."* Similar outcomes have been observed in previous studies, which found that AI-supported feedback enhances metacognitive monitoring and independent revision habits (Wu & Miller, 2024; Zou et al., 2022). The results also demonstrate that learners with higher AI engagement exhibited greater persistence and regularly set independent learning goals, further supporting Holec's (1981) conceptualisation of autonomy as active responsibility for learning decisions.

Student Perceptions

Student perceptions of AI tools were largely positive, with survey responses indicating strong agreement that AI facilitated learning efficiency, confidence building, and personalized support. Many participants perceived AI as a *"non-judgmental assistant"*, lowering anxiety associated with speaking or writing in English. This finding echoes Nguyen and Tran's (2023) results in Vietnam, where chatbot-based speaking practice increased learners' willingness to communicate. Students highlighted benefits such as convenience, flexibility, and access to authentic language examples through tools like YouGlish and Microsoft Copilot. Motivation appeared closely tied to perceived usefulness and ease of use, consistent with the Technology Acceptance Model (Davis, 1989; Teo, 2022). However, perceptions were not uniformly positive. Some interviewees expressed skepticism about the accuracy of AI feedback or concern about "losing originality" when relying too much on AI writing tools. Others emphasized that while AI was helpful for correcting surface-level mistakes, it did not fully replace human instruction for complex writing or speaking tasks requiring nuance and cultural awareness.

Challenges and Barriers

Despite positive learning benefits, findings revealed notable challenges. Digital literacy emerged as a significant barrier among lower-proficiency learners, who struggled to interpret AI feedback or navigate advanced functions. This aligns with global

findings highlighting unequal readiness to adopt intelligent learning systems (Kohnke, Zou, & Zhang, 2023). Dependency on AI also surfaced as a concern, with several students reporting reduced effort in generating original content when using text-generation tools such as ChatGPT. Plagiarism and ethical uncertainty were recurring concerns, particularly among students unfamiliar with academic integrity norms. Additionally, variability in internet access and device limitations affected some students, reflecting broader barriers identified in Southeast Asian digital-education contexts (Lee & Lee, 2024). Interviews also revealed affective barriers, including frustration when AI feedback was unclear or conflicting, suggesting that effective AI integration requires learner training and pedagogical mediation rather than standalone usage.

Discussion in Relation to Literature

The findings of this study reinforce and extend existing literature on AI-enhanced autonomous learning. Consistent with Benson's (2011) and Little's (1991) frameworks, AI appears to support autonomy by enabling learners to plan, monitor, and evaluate their learning processes. The improvements observed in goal-setting and self-evaluation align with earlier empirical evidence demonstrating that AI systems promote metacognitive strategy development (Wu & Miller, 2024; Zou et al., 2022). Positive learner perceptions parallel studies showing that AI increases confidence and motivation by reducing fear of error and enabling private practice (Nguyen & Tran, 2023). However, this study adds nuance by highlighting dependency patterns and ethical concerns, which are less explored in existing literature. Unlike previous studies conducted in university settings, vocational students demonstrated more instrumental motivations tied to employability and practical communication skills, suggesting learner context influences AI adoption. The results therefore reinforce the importance of guided AI use aligned with pedagogical frameworks rather than unregulated integration, supporting calls in the field for responsible AI literacy and human-AI partnership approaches in language education (Kessler, 2023).

Overall, the study demonstrates that while AI tools positively influence autonomous learning behaviours, careful implementation, training, and ethical guidance are necessary to maximize learning benefits and minimize risks.

Conclusion and Implications

The findings of this study provide meaningful insight into how AI tools influence autonomous learning behaviours among EFL students at DAP. Addressing the two guiding research questions, the results indicate that AI tools have a positive impact on students' ability to set learning goals, monitor their progress, evaluate their performance, and sustain motivation key indicators of autonomous learning. Students who engaged more regularly with AI platforms demonstrated significantly higher levels of self-regulation, confidence, and willingness to practice independently compared to low-frequency AI users. However, the study also identified several challenges, including uneven digital literacy, potential dependency on AI-generated content, plagiarism concerns, and accessibility limitations. These findings suggest that while AI can meaningfully support autonomous learning, its benefits are maximized when learners are equipped with appropriate guidance and ethical frameworks.

The implications of this study extend across multiple educational stakeholders. For teachers, the results highlight the importance of intentional AI integration strategies such as designing guided AI-assisted learning tasks, modelling effective interaction with AI tools, and explicitly teaching students how to interpret AI-generated feedback. Rather than replacing instruction, AI should be used as a complementary tool that fosters metacognitive awareness and independent learning habits. For curriculum designers, the findings support the development of blended learning frameworks that embed AI tools into structured learning pathways, enabling personalization while preserving pedagogical coherence. For educational institutions, the study underscores the need for professional development, digital literacy support, and clear policies surrounding academic integrity and AI use in language learning. System-level planning will ensure equitable access and consistent implementation aligned with institutional learning objectives.

Based on these findings, several recommendations emerge. First, responsible AI use should be promoted through explicit instruction in digital ethics, citation practices, and boundaries between legitimate support and inappropriate reliance. Second, learners should receive scaffolded opportunities to develop self-regulation and critical engagement with AI feedback to avoid passive usage patterns. Third, institutions should establish guidelines that promote transparency, accountability, and data privacy in AI-supported learning environments.

Finally, this study opens avenues for further research. Future studies should include longitudinal designs to explore how AI influences autonomy development over time, as well as experimental research comparing different AI tools and instructional models. Investigating diverse learner profiles and institutional contexts including rural, secondary, or multilingual environments would also deepen understanding of AI's role in supporting autonomous language learning globally.

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