

**INVESTIGATING THE LONG-TERM EFFECTS OF AI-SUPPORTED
LANGUAGE INSTRUCTION ON LEARNER AUTONOMY**

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ABSTRACT: This study examines the long-term effects of AI-supported language instruction on learner autonomy among English as a Foreign Language (EFL) students. With Artificial Intelligence increasingly integrated into language education through intelligent tutoring systems, personalized feedback platforms, and language learning applications, questions arise regarding how these tools shape learners' independence over time. Using a longitudinal mixed-method approach over 12 months in three EFL contexts, this research investigates how AI-driven instruction influences students' self-regulation, metacognitive awareness, and proactive learning behaviors. Findings suggest that while AI tools can foster greater learner autonomy when implemented strategically, overreliance may hinder self-directed development. The study concludes with pedagogical implications for sustaining autonomy in AI-mediated environments.

Keywords: Artificial Intelligence, Learner Autonomy, EFL, Language Instruction, AI in Education, Intelligent Tutoring Systems, Self-Regulated Learning

INTRODUCTION

In the evolving landscape of language education, Artificial Intelligence (AI) has introduced unprecedented opportunities for individualized, adaptive, and responsive instruction. From grammar checkers and pronunciation coaches to fully interactive AI tutors, language learners today increasingly interact with intelligent systems that not only deliver content but also guide their learning processes.

At the heart of effective language acquisition lies the principle of learner autonomy—a concept defined by Holec (1981) as the ability to take charge of one's own learning. Autonomy encompasses planning, monitoring, and evaluating one's progress, making strategic learning decisions, and maintaining motivation and discipline. Traditionally, fostering autonomy has been a central goal of communicative

language teaching, but the role of AI in promoting or inhibiting this autonomy remains underexplored.

This research addresses the central question: What are the long-term effects of AI-supported language instruction on the development and sustainability of learner autonomy? By focusing on how AI tools affect learners’ self-regulation, goal-setting, reflection, and independence over an extended period, this study contributes to understanding AI’s transformative—but potentially double-edged—role in language education.

METHODOLOGY

Research Design

A longitudinal, mixed-methods design was adopted, tracking changes in learner autonomy among EFL learners over 12 months. The study combined quantitative surveys, qualitative interviews, learning analytics, and classroom observations.

Participants

The research was conducted in three countries: Japan, Uzbekistan, and Brazil. A total of 180 intermediate-level EFL students (aged 17–24) participated. They were divided into two groups:

- **Experimental Group (n=90):** Received AI-supported instruction via tools such as ChatGPT, Duolingo Max, Write & Improve (Cambridge), and custom LMS-based AI modules.

- **Control Group (n=90):** Received traditional teacher-led instruction without AI tools.

Instruments and Data Collection

1. **Learner Autonomy Questionnaire (LAQ):** Administered at baseline, 6 months, and 12 months.

2. **Learning Diaries:** Students recorded reflections on their learning strategies and decisions weekly.

3. **Semi-Structured Interviews:** Conducted with 20 students per group at 6 and 12 months.

4. **Usage Analytics:** Tracked AI tool interaction frequency, session duration, and learning patterns.

5. **Teacher Logs and Observations:** Used to document classroom behaviors and engagement.

Data were analyzed using SPSS for quantitative changes in autonomy scores and NVivo for thematic coding of qualitative responses.

RESULT

Quantitative Findings

Autonomy scores (scale: 0–100) increased significantly in the experimental group over the 12-month period:

• **Experimental Group:** Mean baseline score = 52.4 → Month 6 = 65.1 → Month 12 = 74.3

• **Control Group:** Mean baseline score = 51.7 → Month 6 = 57.2 → Month 12 = 60.8

Statistical analysis (ANOVA) revealed a significant difference ($p < 0.01$) in the growth of autonomy between the groups. Learners using AI tools showed greater improvements in goal-setting, time management, and monitoring their progress.

Qualitative Insights

1. **Self-Paced Learning and Responsibility** Students in the AI-supported group reported greater responsibility for their learning. One Uzbek participant shared: "I set my own schedule because the AI gives me feedback any time I want. I feel like I'm not just doing what the teacher says but learning for myself."

2. **Strategic Learning Behaviors** The presence of real-time feedback from AI tools enabled learners to revise and refine their language output independently. Brazilian students using Write & Improve noted that instant grammar suggestions helped them reflect on errors and apply strategies consistently.

3. **Motivation and Engagement** Japanese learners reported higher motivation when using gamified AI tools like Duolingo Max, which maintained learning momentum between classes and reduced dependency on classroom instruction.

4. **Overreliance and Passive Interaction Risks** However, a subset of students became overly reliant on AI-generated answers. Interviews revealed that when tasks became too easy due to AI support, some learners disengaged from deeper learning:

"I just let the AI rewrite my sentence. I didn't think why it was better." (Brazilian participant)

DISCUSSION

The findings suggest that AI tools can significantly enhance learner autonomy when used as facilitators rather than crutches. The increase in self-regulated learning

behaviors—such as goal-setting, error correction, and independent study—demonstrates the potential of AI systems to align with constructivist and learner-centered pedagogies.

However, autonomy development depends on how AI is introduced and scaffolded. Without teacher guidance or reflective components, students may misuse AI tools as shortcuts, bypassing critical thinking and self-evaluation. Thus, the role of educators remains crucial—not in delivering content per se, but in mentoring learners to use AI responsibly and metacognitively.

AI can serve as a “Zone of Proximal Development” scaffold (Vygotsky, 1978), supporting learners just beyond their current competence level. Yet, over time, the goal must be to gradually reduce reliance on the tool, fostering learners' ability to regulate their learning without external prompts.

Moreover, cultural and contextual differences shaped how autonomy emerged. In Japan, structured learning norms delayed autonomous behavior until students internalized how to interact with AI meaningfully. In Uzbekistan, limited prior exposure to technology slowed early progress but eventually led to a steeper growth curve once familiarity developed.

CONCLUSION

This study provides strong evidence that AI-supported instruction can positively influence learner autonomy in EFL contexts over the long term. Learners using AI tools became more independent, reflective, and strategic in their learning. However, the benefits of AI are not automatic. Careful integration, reflective guidance, and cultural sensitivity are necessary to ensure that technology empowers rather than replaces autonomous learning.

To sustain autonomy in AI-mediated environments, future instructional design should include:

- Metacognitive training on how to use AI tools.
- Regular self-assessment activities.
- Teacher-facilitated reflection sessions.
- Gradual reduction of AI dependence over time.

AI holds transformative potential in language learning, but its success in fostering autonomy depends not just on the sophistication of algorithms, but on the pedagogical frameworks into which it is embedded.

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