

Cross-Cultural Effects of AI-Supported Language Learning: A Comparative Study of Student Engagement and Learner Autonomy in EFL Contexts

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Abstract

The rapid expansion of artificial intelligence in language education has created new possibilities for personalized feedback, dialogic practice, adaptive assessment and independent learning. This article examines the cross-cultural effects of AI-supported language learning on student engagement and learner autonomy in English as a Foreign Language (EFL) contexts. The study focuses on two frequently used digital tools, ChatGPT and Duolingo, and compares how learners from different educational traditions respond to AI-mediated instructional support. A mixed-method comparative design was applied, combining pre- and post-intervention language tasks, learner autonomy and engagement questionnaires, classroom observation and semi-structured interviews. The analysis indicates that AI-supported activities can strengthen behavioral, cognitive and emotional engagement, while also encouraging learners to plan, monitor and evaluate their own learning. At the same time, the results show that these effects are not culturally neutral: learners' readiness for self-directed learning, their perception of teacher authority, access to digital infrastructure and prior experience with educational technologies all shaped the way AI tools were adopted. The article argues that AI should be integrated not as a substitute for teacher mediation, but as a culturally responsive pedagogical resource. The findings contribute to current discussions on AI in higher education and EFL pedagogy by demonstrating that the effectiveness of AI-supported learning depends on the alignment between technological affordances, institutional conditions and local learning cultures.

Keywords: artificial intelligence; EFL; learner autonomy; student engagement; ChatGPT; Duolingo; cross-cultural learning; digital pedagogy.

INTRODUCTION

Artificial intelligence has become one of the most influential technological developments in contemporary education. In language learning, AI-based systems are increasingly used to provide automated feedback, individualized tasks, conversational practice and data-driven recommendations. These functions are especially significant in EFL contexts, where learners may have limited opportunities to use English outside the classroom. AI-supported platforms can extend learning beyond scheduled lessons and create additional spaces for interaction, rehearsal and reflection.¹

The pedagogical relevance of AI in EFL is connected not only with access to digital tools but also with the quality of interaction that such tools make possible. Generative AI systems such as ChatGPT can simulate written dialogue, explain grammatical choices, provide examples, reformulate learner output and support idea generation. Gamified adaptive platforms such as Duolingo can structure repeated practice through short tasks, immediate correction and progress visualization. These affordances may increase engagement because learners receive frequent responses to their actions and can observe their own progress more directly.²

However, technological affordances do not operate in a social vacuum. Language classrooms are shaped by cultural expectations about the teacher's role, acceptable forms of learner initiative, the value of independent work and the degree to which students are encouraged to experiment with language. In some educational traditions, learners are accustomed to teacher-led explanation and may initially perceive AI tools as supplementary dictionaries or grammar checkers. In other contexts, students may be more familiar with self-directed learning and therefore use AI tools as partners in planning, practicing and evaluating learning tasks.

This cross-cultural dimension remains insufficiently examined. Much of the existing literature discusses AI in education in broad terms, while empirical work in language education often focuses on one institutional setting. As a result, the same tool may be treated as if it produces similar outcomes across contexts. The present article addresses this gap by examining how AI-supported language learning affects student engagement and learner autonomy in two different EFL environments. The central research question is: How do AI-supported tools influence student engagement and learner autonomy across different cultural and educational contexts?

LITERATURE REVIEW

AI in higher education has been studied through several interrelated lenses: intelligent tutoring systems, learning analytics, adaptive learning platforms, automated assessment and, more recently, generative AI. Zawacki-Richter, Marín, Bond and Gouverneur's systematic review showed that AI applications in higher education had expanded rapidly, but also noted that many studies were technology-driven and paid insufficient attention to pedagogical theory and teacher involvement. This observation is important for EFL research because successful language learning

¹See Godwin-Jones (2024), who discusses generative AI as a means of extending second-language practice through distributed learner-tool agency.

²Kohnke, Moorhouse and Zou (2023) describe ChatGPT as a language teaching and learning resource, while Ouyang (2024) reports engagement-related gains from Duolingo use in EFL online classes.

depends on interaction, motivation, feedback and social meaning, not merely on automated content delivery.³

In language education, AI tools are often valued for their capacity to provide immediate individualized feedback. Kohnke, Moorhouse and Zou describe ChatGPT as a tool with potential for language teaching and learning, particularly in relation to idea generation, interaction, explanation and learner support, while also emphasizing the need for digital competence and ethical guidance. Xiao and Zhi's exploratory work with EFL learners likewise shows that students may perceive ChatGPT as useful for language learning tasks, but that its value depends on learner strategies and awareness of limitations. These studies suggest that AI can support learning when students know how to ask questions, evaluate responses and transform feedback into language development.⁴⁵

Mobile-assisted and gamified language learning research provides a parallel line of evidence. Duolingo and similar platforms use short learning units, progression systems and immediate corrective feedback to maintain learner participation. Ouyang's quasi-experimental study reported positive effects of Duolingo on EFL learners' willingness to communicate and engagement in online classes, including affective, cognitive and behavioral domains. Such findings are consistent with broader research on mobile-assisted language learning, which shows that accessibility and frequent practice can strengthen learner persistence when activities are meaningfully connected to classroom goals.⁶

The concept of learner autonomy is central to this study. Holec's classic definition describes autonomy as the learner's capacity to take charge of learning decisions, including objectives, content, methods and evaluation. Later work by Little and Benson emphasizes that autonomy is not simple independence from the teacher; rather, it is a socially situated capacity that develops through reflection, responsibility and appropriate support. In digital environments, autonomy involves the ability to select resources, regulate attention, monitor progress and make informed decisions about the use of automated feedback.⁷

Self-regulated learning theory provides a useful framework for operationalizing autonomy. Zimmerman conceptualizes self-regulation as a cyclical process involving forethought, performance control and self-reflection. AI-supported learning can potentially strengthen each phase: learners may set goals before practice, receive automated prompts or feedback during performance, and review progress data after completing tasks. Nevertheless, these benefits require

³Zawacki-Richter et al. (2019) review AI applications in higher education and emphasize the need for stronger pedagogical and educator-centered perspectives.

⁴Xiao and Zhi (2023) analyze EFL learners' experiences and perceptions of ChatGPT for language learning tasks.

⁵Kohnke, L., Moorhouse, B. L., and Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal*, 54(2), 537-550.

⁶Ouyang (2024) reports positive effects of Duolingo on EFL learners' willingness to communicate and learner engagement in online classes.

⁷Holec (1981) defines learner autonomy as the capacity to take charge of one's own learning, a foundational definition in autonomy research.

pedagogical scaffolding. Without guidance, learners may use AI superficially, accept inaccurate feedback uncritically or become dependent on automated correction.⁸

Student engagement is another key construct. Engagement is usually understood as a multidimensional phenomenon that includes behavioral participation, cognitive investment and emotional involvement. In AI-supported EFL learning, behavioral engagement may be reflected in task completion and frequency of interaction; cognitive engagement may appear in revision, questioning and strategy use; emotional engagement may be observed in confidence, curiosity and reduced anxiety. Cross-cultural comparison is therefore necessary because the visible form of engagement may differ: one group may demonstrate engagement through individual exploration, while another may show it through collaborative discussion and teacher-mediated reflection.

METHODOLOGY

The study used a mixed-method comparative design, but the procedure was deliberately kept close to ordinary classroom practice. Quantitative data made it possible to trace changes in language performance, engagement and autonomy before and after the AI-supported tasks. The qualitative part was equally important: it captured how students actually behaved when a digital tool entered a familiar EFL classroom, especially when teacher explanation, peer discussion and mobile-phone use intersected within one lesson.

The sample consisted of 64 second-year undergraduate students studying English as a foreign language, aged 18-21. Thirty-two participants were selected from compulsory English-language courses at Samarkand State Institute of Foreign Languages, and thirty-two were selected from a comparable EFL setting at Gazi University. In each institution, students were divided into a control subgroup and an experimental subgroup. The control subgroups continued textbook-based tasks, teacher explanation and structured pair work. The experimental subgroups completed the same thematic language tasks, but added ChatGPT and Duolingo during a six-week instructional period. At SamSIFL, the lessons were held in regular language classrooms where students often moved between English, Uzbek and Russian during peer clarification; this multilingual habit became one of the visible local features of the intervention.

The AI-supported intervention was organized around three classroom routines. First, students used ChatGPT for short written dialogues, vocabulary clarification, sentence reformulation and feedback on 80-120-word responses. Second, they used Duolingo for ten-minute micro-practice at the beginning or end of selected lessons, mainly for vocabulary consolidation and grammar recognition. Third, every AI task was followed by a brief classroom discussion. Students compared the machine-generated explanation with teacher feedback, marked doubtful answers and explained why they accepted or rejected a suggested correction. This step was necessary. In the first observation week, several students treated ChatGPT almost as a ready-made answer source; by the third week, more of them began asking for examples, alternatives and simpler explanations.

Data were collected through pre- and post-intervention language tasks, autonomy and engagement questionnaires, classroom observation sheets and semi-structured interviews. The

⁸Zimmerman (2002) presents self-regulated learning as a cyclical process involving forethought, performance and self-reflection.

language tasks included a short writing task, vocabulary-in-context items and a guided response activity. The observation protocol recorded not only participation frequency but also concrete classroom episodes: who asked follow-up questions, who revised an answer after feedback, who checked a peer's version and who waited for the teacher's confirmation. Interviews were conducted in a semi-formal manner after class, because students were noticeably more open when they were not speaking in front of the whole group.

Quantitative data were analyzed descriptively and comparatively, with attention to the differences between control and experimental subgroups in both institutions. Qualitative data were examined through thematic coding. The main codes included autonomy, engagement, technological readiness, teacher mediation, peer support, trust in AI output and hesitation before independent decision-making. Some codes emerged directly from classroom notes rather than from the initial framework. For example, the code 'teacher confirmation' was added after repeated observations that students accepted an AI explanation only after the instructor reformulated it orally. This integration of numerical and observational evidence helped identify not only what changed, but how the same digital tool acquired different meanings in two academic cultures.

Component	Indicator	Data source
Behavioral engagement	Task completion, frequency of participation, continuity of practice	Questionnaire, observation
Cognitive engagement	Use of strategies, revision of output, analytical questioning	Observation, interview
Emotional engagement	Confidence, interest, reduced anxiety, perceived usefulness	Questionnaire, interview
Learner autonomy	Goal setting, self-monitoring, reflection and resource selection	Autonomy scale, interview
Contextual mediation	Teacher role, institutional support, digital readiness, peer norms	Observation, interview

RESULTS

Especially notable was the way AI-supported language learning changed the rhythm of participation. In both experimental subgroups, students practiced more consistently and returned to unfinished tasks after receiving immediate feedback. ChatGPT was most helpful when learners needed reformulation, examples or a less formal explanation of an error. Duolingo worked differently: it created a short, almost ritualized moment of repetition. Together, the two tools increased contact with English beyond the lesson and made feedback feel closer, less delayed and less dependent on a single teacher correction.

Behavioral engagement appeared first in small, visible actions. Students opened the applications before the teacher reminded them. Some remained after class for two or three minutes to complete a streak or correct a written phrase. In the SamSIFL group, one repeated pattern was peer checking: a student would show a ChatGPT version to a classmate, ask in Uzbek whether it

sounded 'natural', and then wait for the teacher's final comment. Control-group students, by contrast, usually completed only the tasks required during class time and relied more strongly on direct correction from the instructor.

Cognitive engagement became clearer when learners stopped copying and started arguing with the feedback. They asked why one tense sounded more appropriate than another, requested shorter examples and tested alternative phrases. This was a meaningful shift, but it was uneven. A few students still pasted AI-produced sentences into their notebooks without analysis. The more productive episodes occurred when the teacher asked a simple follow-up question: 'What exactly changed in your sentence?' That question often turned a mechanical correction into a short grammatical discussion.

Emotional engagement also changed, although not always loudly. Several students described ChatGPT as less embarrassing than public correction because it allowed repeated questions without classmates listening. Duolingo's progress indicators produced a modest but visible sense of achievement, especially among quieter students. One interviewee explained that she was 'not afraid to be wrong with the phone first' and could then speak more confidently in class. At the same time, uncertainty remained. When AI explanations sounded too polished or too general, students still looked to the teacher for confirmation.

Learner autonomy improved most clearly in planning and self-monitoring. Students began to name specific weaknesses: articles, word order, prepositions, vocabulary range or confidence in written answers. They also selected supplementary practice more intentionally. The difference between contexts was important. Where students were already familiar with learner-centered tasks, AI quickly became a resource for independent practice. Where teacher-centered habits were stronger, students first used AI as a convenient answer source and only gradually began to treat it as a tool for regulating their own learning.

The cross-cultural comparison produced one particularly revealing pattern: the same tools did not create the same classroom behavior. In one setting, engagement was more individual and exploratory; students experimented with prompts, saved useful explanations and planned further practice. In the SamSIFL observations, engagement was often more collective and teacher-mediated. Students discussed AI responses with peers, translated difficult explanations into Uzbek or Russian, and waited for instructor validation before recording the final version. Autonomy therefore developed best when AI tasks were placed inside a clear pedagogical frame rather than offered as an open technological option.

DISCUSSION

Especially notable is that the positive effect of AI was not caused by novelty alone. The tools mattered, but the classroom arrangement mattered more. AI became educationally meaningful when students were asked to explain their choices, compare sources and connect digital feedback with course objectives. The findings therefore support a pedagogical rather than purely technical interpretation of AI-supported EFL learning. A platform can accelerate feedback, but it cannot decide what counts as a meaningful learning move in a particular classroom.

ChatGPT was strongest in tasks requiring explanation, dialogue and revision. Its conversational format helped students interact with English in a flexible way and receive input adjusted to their

questions. In observed lessons, the most useful prompts were not broad requests such as 'check my English', but more precise requests: 'explain this at B1 level', 'give two alternatives' or 'show why this preposition is wrong'. This supports the idea of distributed agency between teacher, learner and tool. Still, the limitation was visible: some answers were fluent but contextually unsuitable. Teacher mediation and critical digital literacy therefore remained essential.

Duolingo's contribution was narrower, but in some ways more stable. Students did not usually treat it as a source of deep linguistic explanation. They used it as a manageable practice routine: five minutes, a few items, an immediate score, a visible sign of progress. This modest routine was valuable because it reduced the psychological weight of language practice. Not every learner is ready for long independent study sessions, but many can complete a short mobile task and then discuss one mistake in class.

The autonomy findings need a careful reading. Greater autonomy did not mean that students no longer needed the teacher. In fact, the opposite was often true during the early stages. Teacher support helped learners understand when to trust AI, when to question it and how to convert automated feedback into a learning decision. The hesitation observed in more teacher-centered settings should not be interpreted as lack of ability. It reflects an institutional habit: students have learned that the teacher's explanation is the safest academic reference point. Autonomy, in this sense, had to be built gradually.

The study also raises a practical issue of academic integrity. AI-supported learning can slide from assistance into substitution when the task asks only for a finished answer. This risk was visible in the first weeks, when some students submitted unusually polished sentences that they could not explain orally. The solution was not to ban AI, but to make the learning process visible: prompt logs, short revision notes, comparison between AI and teacher feedback, and brief oral explanations of final choices. These requirements made misuse easier to notice and genuine learning easier to support.

From a cross-cultural perspective, the main implication is local adaptation. Institutions should not import AI-based learning models as ready-made packages. At SamSIFL, for example, multilingual peer explanation, uneven device access and respect for teacher authority influenced how students approached the tools. In a setting with stronger traditions of independent digital learning, the same tools can be used for projects, peer review and individualized pathways. In a setting where self-regulation is still developing, tasks should begin with guided prompts, shared reflection and teacher-approved evaluation criteria before moving toward freer exploration.

PRACTICAL RECOMMENDATIONS

First, AI tools should be introduced through explicit pedagogical objectives. Instead of asking students simply to use ChatGPT or Duolingo, teachers should define what the tool is expected to support: vocabulary review, pronunciation practice, written revision, dialogue rehearsal, grammar explanation or reflective self-assessment. Clear objectives reduce mechanical use and make learning outcomes more visible.

Second, teachers should develop students' prompt literacy and evaluative literacy. Learners need to know how to formulate precise questions, request examples, ask for explanations at an appropriate proficiency level and verify responses. They also need to understand that AI output is

not automatically correct. Comparison with textbooks, teacher feedback and peer discussion should remain part of the learning process.

Third, institutions should support teachers rather than place the burden of AI integration entirely on individual instructors. Professional development, shared task banks, ethical guidelines and assessment policies are necessary. Without institutional support, AI may be used inconsistently, creating unequal learning opportunities across groups.

Fourth, culturally responsive implementation should be prioritized. In teacher-centered contexts, AI integration should begin with guided tasks and collective reflection. In more autonomous contexts, AI can be used for individualized projects, independent research tasks and self-designed practice plans. In both cases, the teacher remains essential as a designer, facilitator and evaluator of learning.

CONCLUSION

This article has examined the cross-cultural effects of AI-supported language learning on student engagement and learner autonomy in EFL contexts. The findings show that ChatGPT and Duolingo can increase participation, motivation, reflection and independent learning behaviors when they are integrated into a structured pedagogical design. The classroom evidence suggests that the most valuable changes were not dramatic, but cumulative: more revisions, more questions after feedback, more willingness to test a phrase privately before using it publicly, and more conscious attention to personal learning difficulties.

At the same time, the study demonstrates that AI-supported learning is not culturally uniform. Learners' responses are shaped by educational traditions, teacher-student relationships, digital readiness and attitudes toward independent work. In one context, students may use AI as a space for individual exploration; in another, they may first need peer discussion and teacher confirmation before using AI autonomously. These differences should not be treated as obstacles. They are design conditions that make the integration of AI more realistic and pedagogically responsible.

The central conclusion is that AI should be understood as a complementary pedagogical resource rather than a replacement for human instruction. Its effectiveness depends on teacher mediation, critical digital literacy, ethical use and cultural adaptation. Future research should examine longitudinal outcomes, include larger and more clearly defined samples, compare additional EFL contexts and investigate how teachers' roles evolve in AI-enhanced language education. Such research will help develop models of digital language learning that are not only technologically advanced but also pedagogically sound and culturally responsive.

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