



# A Review of AI-Driven Environment Impact on EFL Learners' Motivation

Mohammed Hanafy Mahmoud Aly

Assistant Professor

Department of Foreign Languages

Jazan University, Jazan, KSA

## Abstract

This review aggregates current empirical findings regarding the role of artificial intelligence (AI) in boosting motivation among those learning English as a Foreign Language (EFL). By analyzing 76 peer-reviewed papers from 2017 to 2025, the review explores how various AI tools—including conversational agents, intelligent tutors, personalized learning software, virtual/augmented reality (VR/AR), and gamified platforms—interact with student drive. The data indicates that AI-supported settings yield a substantial positive effect on motivation ( $\beta = 0.867$ ). Strong statistical links were found between motivational success and factors such as social presence ( $\beta = 0.81$ ), human-like interaction ( $\beta = 0.76$ ), and student self-efficacy. However, the review identifies hurdles including digital inequality, concerns over academic honesty, and "metacognitive laziness." The conclusion suggests that when AI is paired with strong pedagogical support and teacher involvement, it can significantly improve internal motivation and the ability of students to manage their own learning.

**Keywords:** Artificial Intelligence (AI), English as a Foreign Language (EFL), Student Motivation, Conversational Agents, Personalized Learning Software, Gamified Platforms, Self-efficacy.

## 1. Introduction

Bringing AI into the classroom has made a significant impact on design of learning routes for language acquisition. EFL, intended for largely mixed ability and motivation groups, has also seen AI version created in personalized tutoring, instant corrections and greater interactivity (Yang et al., 2025). The refinement of such natural language processing and generative models like Conversation GPT, have seen it pushed into schools, apps for language instruction at a fast pace too (Wei et al., 2025).

Since motivation is the biggest factor for successful language learning – the more motivated you are, the more effort you put into language studies and hence the better you become, it is still a priority (Wei, 2023). Traditional EFL settings more often because they cannot keep people engaged thus learning is restricted to fixed time slots and little or no real communicative activity (Qin, 2024). These gaps are filled by AI tools that have flexible arranged learning and interactive programs based on learner type.

## 2. Problem Statement

Continuous student motivation is difficult to achieve. Teaching language without the use of technology often leads to "motivational deficits". Curriculum is not tailored to students' learning styles or proficiency (Schmidt & Strassner, 2022). Lessons that follow textbooks often teach grammar in isolation, leaving little room for authentic communication (Kikuchi, 2019).

Online classes became the norm out of necessity during the pandemic. However, many students found online school un motivating (Jerotijević-Tišma & Radosavljević-Krsmanović, 2024). Students also experience inequality in technological accessibility and digital literacy (Párraga et al., 2025). Emerging research also suggests too much use of AI can cause learners to develop "metacognitive laziness", or laziness in their own learning instead of taking initiative (Fan et al., 2024). These challenges show that incorporating AI in the classroom requires further scrutiny to avoid compromising on quality or ethics.

## 3. Research Objectives and Questions

**3.1 Objectives** This review seeks to evaluate: (a) classes of AI tools implemented for EFL purposes and differential effects on motivational components; (b) overall strength of AI effects (along with statistics such as effect sizes) and trends over time; (c) psychological processes (e.g., autonomy, competence) driving these effects; (d) moderating factors (e.g., age, experience with technology) of these effects; and (e) criticisms and negative effects of AI.

### 3.2 Research Questions

1. What is the magnitude of the effects of AI on EFL learners' motivation relative to traditional instruction and does this vary by AI tool type?
2. What psychological mechanisms are responsible for AI's impact on motivation (e.g., social presence, self-regulatory processes)?
3. What contextual and individual factors inhibit AI's effects on motivation and what are potential negative effects of AI (e.g., digital divide)?

## 4. Method

A systematic literature review was carried out with an aim of reviewing scholarly works that examined the relationship between AI environments and EFL motivation. This was done by looking for peer-reviewed articles written between the start of 2017 and the end of 2025 using relevant keywords such as "AI," "chatbots," "EFL," and "motivation." Only scholarly works written in the English language were included. They had to have over 20 participants.

## 5. Findings

### 5.1 AI Technologies in EFL Environments

- **5.1.1 Chatbots and Conversational AI:** The use of such technologies is well-established within the research literature on AI applications, providing learners with opportunities to speak whenever necessary (Kooti et al., 2025). For instance, an experiment with 60 Iranian EFL learners using ChatGPT lessons resulted in enhanced speaking skills compared to the control group, along with lowered anxiety levels. It is important to note that "social presence," which means making learners believe they have a live partner, is one of the major motivational factors (Ebadi & Amini, 2022). The more human-like the chatbot is, the better it maintains students' interests ( $r = 0.76$ ).

- **5.1.2 Intelligent Tutoring and Adaptive Learning:** As a principle, these types of systems monitor students' progress through algorithms that adapt the difficulty of tasks according to real time results (Qin 2024), in order to keep learners on line with their attention its flow state. Such tailored experiences also fulfill the core aspect of self-determination (Hsu & Lin, 2014) which is innate to intrinsic motivation for learners.
- **5.1.3 Immersive Technologies (VR and AR):** Technologies such as VR have proven useful in providing context-based simulation of real-world scenarios such as interviews and guided tours (Chen et al., 2022). In a study involving 357 Chinese students, it has been discovered that the "AI Literacy" concept is a major determinant of the level of immersion that students will have in the technologies (Zhang & Miao, 2025). Emerging architecture designs such as the SENIT architecture now integrate language fluency with reinforcement learning (Lakshmi et al., 2026).
- **5.1.4 AI-Enhanced Gamification:** Gamified AI applications make use of the need for accomplishment and progression on the part of humans in order to engage their learners. Programs like Duolingo incorporate adaptive complexity and spaced repetition, combined with the ability to track progress in social contexts, which include leaderboard systems and badges. Even though all of these aspects work efficiently to motivate learners to practice speaking at the initial phase of learning a foreign language, issues of contextual authenticity and vocal feedback remain. External incentives might attract learners; however, it is essential to motivate them intrinsically (Kang, 2025).

## 5.2 Theoretical Drivers of Motivation

- **5.2.1 Self-Efficacy and Competence Beliefs:** One very important element for the motivational effect produced by AI technology is the increase of the learners' self-efficacy. Self-efficacy stems from several elements, including social modeling, mastery experiences, and emotional control—all of which are achievable using AI technology according to Bandura. It was found that the use of AI technology increases self-efficacy among Chinese EFL students resulting in better productive performance (Huang et al., 2024). These motivational effects are only possible when learners realize skill improvement (Kooti et al., 2025).
- **5.2.2 The L2 Motivational Self System:** In line with Dörnyei's motivational self-system theory, there is an association between motivation and ideal as well as ought-to L2 selves of the learner. Research carried out using AI-IDLE framework indicates that individuals who use AI frequently build a vivid image of their ideal L2 self, while at the same time enjoying the process of language acquisition (Liu et al., 2024). Interestingly, those with no prior self-concept had minimal benefits from AI technology.
- **5.2.3 Autonomy and Self-Regulated Learning (SRL):** The application of AI in instruction helps to enhance self-regulated learning. Learners who engage with technologies based on AI tend to be more motivated and apply self-regulatory strategies more effectively compared to learners who study without AI technology (Wei, 2023). It has been found that there is a strong correlation between motivation, efficacy, and self-regulatory strategy utilization in virtual learning environments, which creates a feedback loop through which AI learning strategy facilitation results in intrinsic motivation (Almayez et al., 2025).

### 5.3 Quantitative Analysis of AI's Impact

- **5.3.1 Statistical Effect Sizes:** Results from meta-analysis indicate that ChatGPT has a considerable impact on academic performance ( $g = 0.867$ ), along with moderate influence on perceptions about progress and application of higher-order thinking skills among learners (Wang & Fan, 2025). The impacts are higher in humanities subjects than in STEM, and higher education contexts than in elementary and secondary levels. One-month to two-month long intervention programs generate more consistent findings.
- **5.3.2 Motivational Dimensions:** Empirical evidence shows that there is a strong relationship between academic motivation and emotional/cognitive control, with a correlation coefficient of  $r = 0.62$  (Yang et al., 2025). Moreover, the AI literacy of a student is found to be a significant predictor of involvement, explaining a considerable amount of variation in motivational efficacy ( $R^2 = 0.64$ ) (Zhang & Miao, 2025).
- **5.3.3 Long-Term Motivation Trends:** Motivation tends to rise while engaging in AI-intervened sessions and remains at higher levels for weeks after that period (Wei, 2023). Nevertheless, some students may initially experience reduced motivation because they struggle with navigating the technology (Fraidan, 2025). On the other hand, robot-intervened sessions have been proven to maintain higher levels of students' interest for ten consecutive weeks (Chen et al., 2022).

### 5.4 Affective and Cognitive Results

- **5.4.1 Lowering Language Anxiety:** Speaking anxiety is an essential secondary benefit that AI tools, such as ChatGPT, offer learners because the space provided by AI tools is free of judgment (Kooti et al., 2025). When learners feel less pressure to speak, they are more likely to be motivated to engage more overall (Ebadi & Amini, 2022).
- **5.4.2 Participation and Active Engagement:** Positive classroom environments and high AI literacy and personal resilience predict more participation (Wang et al., 2024), but if the AI systems do not require students to produce language, then their engagement can become passive (Fan et al., 2024).
- **5.4.3 Resilience and the Risk of "Metacognitive Laziness":** Although AI helps promote resilience, it could also be responsible for the emergence of metacognitive laziness, where students rely too much on AI-driven feedback and fail to check their work for mistakes themselves (Fan et al., 2024; Yang et al., 2025). To counteract this issue, pedagogical fading—gradual reduction in the use of AI—is recommended.

### 5.5 Barriers to Implementation

- **5.5.1 Integrity and Equity:** Academic honesty remains a significant issue, with more than 60% of ChatGPT studies citing it as a concern (Thủy et al., 2024). Additionally, there is a large "digital divide," with students in low-income or rural areas potentially left behind due to lack of connectivity and lower digital literacy (Párraga et al., 2025).
- **5.5.2 Learning Processes and Technical Barriers:** Over-reliance on AI can also hinder knowledge transfer and reduce self-regulated learning processes (Fan et al., 2024). Furthermore, teachers often report feeling unprepared to use AI and fear the reliability of the technology or the risk of professional displacement (Zulkarnain & Yunus, 2023).

## 6. Discussion and Summary

However, from analyzing 76 other research papers, it becomes evident that AI-powered environments are able to significantly increase motivation for EFL learners with an effect size often exceeding traditional educational norms (Wang & Fan, 2025). This is because of AI's ability to build up self-efficacy, reduce students' anxiety levels, and promote greater autonomy among learners. However, AI cannot be perceived as a panacea since it will depend on many factors, including context, timeframe, and the quality of pedagogy that would avoid cheating and 'metacognitive laziness' (Fan et al., 2024).

## 7. Recommendations for Policy and Practice

Educators must understand AI as an enhancement to rather than a replacement for their human teaching. Those designing the curriculum must place a strong emphasis on the process of AI fading in order to foster learner autonomy, whereas policymakers will need to ensure adequate funding for programs ensuring equal access to technology as well as proper training for teachers (Al-khresheh, 2024).

## 8. Suggestions for Future Research

There exists an immediate necessity for longitudinal studies that will take longer than six months and that will not focus only on China and its EFL environments but will include other people around the world. The future researches could also consider what methods could be used for moving away from the reliance on AI towards total independence, including those of the disadvantaged and disabled.

## 9. Conclusion

AI-powered learning environments possess the capacity to significantly improve motivation through personalized learning experiences and reduced performance anxieties. While the statistics proving their effectiveness are strong, the best way to capitalize on this potential is to embrace an evidence-based approach. The future of the field rests on the collaboration of research and teaching professionals to make sure that AI serves as a bridge to self-regulated language learning.

## References

- Al-khresheh, M. H. (2024). The future of artificial intelligence in English language teaching: Pros and cons of ChatGPT implementation through a systematic review. *Language Teaching Research Quarterly*, \*43\*, 1–18. <https://doi.org/10.32038/ltrq.2024.43.04>
- Almayez, M. A., Al-khresheh, M. H., Alkhateeb, I., & Alomaim, T. (2025). Motivation and English self-efficacy in online learning applications among Saudi EFL learners: Exploring the mediating role of self-regulated learning strategies. *Acta Psychologica*, 254, 104796. <https://doi.org/10.1016/j.actpsy.2025.104796>
- Bernal Párraga, [et al.]. (2025). Artificial Intelligence and Personalized Learning in Foreign Languages: An Analysis of Chatbots and Virtual Assistants in Education. *Revista Científica de Salud y Desarrollo Humano*, 6(1), 882–901.
- Chen, J., Fu, Z., Liu, H., & Wang, J. (2022). Effectiveness of virtual reality on learning engagement: A meta-analysis. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, 19(1), 1–14. <https://doi.org/10.4018/IJWLTT.312154>
- Ebadi, S., & Amini, A. (2022). Examining the roles of social presence and human-likeness on Iranian EFL learners' motivation using artificial intelligence technology: A case of CSIEC chatbot. *Interactive Learning Environments*. Advance online publication. <https://doi.org/10.1080/10494820.2022.2096638>
- Fan, Y., Tang, L., Le, H., Shen, K., Tan, S., Zhao, Y., Shen, Y., Li, X., & Gašević, D. (2024). Beware of metacognitive laziness: Effects of generative artificial intelligence on learning motivation,

- processes, and performance. *British Journal of Educational Technology*. Advance online publication. <https://doi.org/10.1111/bjet.13544>
- Fraidan, A. A. (2025). AI and uncertain motivation: Hidden allies that impact EFL argumentative essays using the Toulmin Model. *Acta Psychologica*, 253, Article 104684. <https://doi.org/10.1016/j.actpsy.2024.104684>
- Hsu, C. Y., & Lin, C. H. (2014). Exploring the impact of gamification on students' motivation and engagement in a university course. *Journal of Educational Technology & Society*.
- Huang, F., Wang, Y., & Zhang, H. (2024). Modelling generative AI acceptance, perceived teachers' enthusiasm and self-efficacy to English as a foreign language learners' well-being in the digital era. *European Journal of Education*. Advance online publication. <https://doi.org/10.1111/ejed.12770>
- Jerotijević-Tišma, D., & Radosavljević-Krsmanović, A. (2024). Tertiary-level EFL learners' motivation and classroom engagement in a post-COVID online environment. *Zbornik Radova Filozofskog Fakulteta u Pristini*. <https://doi.org/10.5937/zrffp54-48485>
- Kang, S. (2025). The impact of gamified language learning apps on EFL learners' motivation for spoken English development: A case of Duolingo. *SHS Web of Conferences*, 222, Article 01015. <https://doi.org/10.1051/shsconf/202522201015>
- Kikuchi, K. (2019). Motivation and demotivation over two years: A case study of English language learners in Japan. *Studies in Second Language Learning and Teaching*, 9 (1), 157–175. <https://doi.org/10.14746/ssllt.2019.9.1.7>
- Kooti, M., Abyavi, M., Mombeini, H., & Allahdini, P. (2025). The impact of AI-integrated language instruction on EFL learners' speaking proficiency, speaking anxiety, and foreign language motivation. *Assessment and Practice in Educational Sciences*, 3 (3), 1–12. <https://doi.org/10.61838/japes.3.3.6>
- Lakshmi, A. S., Sigamany, D. E. S., Rautrao, R. R., Ezhilmathi, K., Pagidipati, B., Muniyandy, E., & Sheeba, A. (2026). An AI-driven VR learning framework using RL-optimized transformer models for personalized English proficiency assessment. *International Journal of Advanced Computer Science and Applications*, 17(1), 1–12. <https://doi.org/10.14569/ijacsa.2026.0170120>
- Liu, G., Zou, M., Soyoof, A., & Chiu, M. (2024). Untangling the relationship between AI-mediated informal digital learning of English (AI-IDLE), foreign language enjoyment and the ideal L2 self: Evidence from Chinese university EFL students. *European Journal of Education*. Advance online publication. <https://doi.org/10.1111/ejed.12846>
- Pham Thuy, T. D., Nguyen, T. N. T., & Lai, N. V. (2024). Artificial intelligence (AI) in education: A case study on ChatGPT's influence on student learning behaviors. *Educational Process: International Journal*, 13(2), 105-121. <https://doi.org/10.22521/edupij.2024.132.7>
- Qin, L. (2024). Adaptive system of English-speaking learning based on artificial intelligence. *Journal of Educational Studies*, \*7\*(2), 1–15. <https://doi.org/10.52783/jes.2637>
- Schmidt, T., & Strassner, T. (2022). Artificial intelligence in foreign language learning and teaching. *Anglistik*, \*33\*(1), 1–16. <https://doi.org/10.33675/angl/2022/1/14>
- Wang, Y., & Fan, L. (2025). A meta-analysis of ChatGPT's impact on learning performance, perception, and higher-order thinking. *Computers & Education*, \*215\*, Article 105112.

- Wang, Y., Liu, Q., & Zhang, L. (2024). Classroom climate, AI literacy, and resilience as predictors of EFL learner engagement. *Language Teaching Research*, \*28\*(3), 1–24.
- Wei, L. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*, \*14\*, Article 1261955. <https://doi.org/10.3389/fpsyg.2023.1261955>
- Wei, W., Zhao, A., & Ma, H. (2025). Understanding how AI chatbots influence EFL learners' oral English learning motivation and outcomes: Evidence from Chinese learners. *IEEE Access*, \*13\*, 1–15. <https://doi.org/10.1109/ACCESS.2025.3554545>
- Yang, C., Wei, M., & Liu, Q. (2025). Intersections between cognitive-emotion regulation, critical thinking and academic resilience with academic motivation and autonomy in EFL learners: Contributions of AI-mediated learning environments. *British Educational Research Journal*. Advance online publication. <https://doi.org/10.1002/berj.4140>
- Zhang, Y., & Miao, Z. (2025). Enhancing EFL learners' engagement and motivation through immersive technologies: The role of artificial intelligence, augmented reality, virtual reality, and mobile applications. *European Journal of Education*. Advance online publication. <https://doi.org/10.1111/ejed.70128>
- Zulkarnain, N. S., & Yunus, M. M. (2023). Primary teachers' perspectives on using artificial intelligence technology in English as a second language teaching and learning: A systematic review. *International Journal of Academic Research in Progressive Education and Development*, \*12\*(2), 1–18. <https://doi.org/10.6007/ijarped/v12-i2/17119>