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Generative AI in CALL: Enhancing Self-Regulated L2 Learning Through Adaptive Chatbots

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Abstract: Generative artificial intelligence (GenAI) has introduced new possibilities for computer-assisted language learning (CALL), particularly through adaptive chatbots capable of natural conversation and personalized feedback. This review synthesizes recent research on how GenAI chatbots support self-regulated learning (SRL) among second language (L2) learners. Findings indicate that chatbots can enhance all phases of SRL by prompting goal-setting, enabling strategy use through interactive practice, and facilitating reflection via feedback and progress summaries. Their adaptive, always-available nature provides individualized scaffolding that promotes autonomy, engagement, and sustained practice. Evidence also shows positive effects on motivation, confidence, vocabulary retention, and reduced anxiety, though long-term sustainability and over-reliance remain concerns. The review emphasizes that pedagogically guided use is essential: when integrated meaningfully into instruction, chatbots can function as powerful mediators of cognitive, metacognitive, and affective processes in L2 learning. Implications for design, teacher training, and future research directions are discussed.
Keywords*; Generative AI, CALL, chatbots, self-regulated learning*

Introduction

The field of computer-assisted language learning (CALL) has continually evolved alongside technological advances, from early language software to modern intelligent tutors. The emergence of generative artificial intelligence (GenAI) – exemplified by large language model chatbots like ChatGPT – represents a new frontier in CALL. These AI-driven chatbots are capable of engaging learners in human-like dialogue and providing adaptive feedback in real time. Educators and researchers are increasingly interested in how such generative AI chatbots can be harnessed as *personalized language tutors* to support second language (L2) acquisition beyond what traditional CALL tools offered. In particular, attention has turned to their potential for fostering self-regulated learning (SRL) – the capacity of learners to plan, manage, and assess their own learning process.

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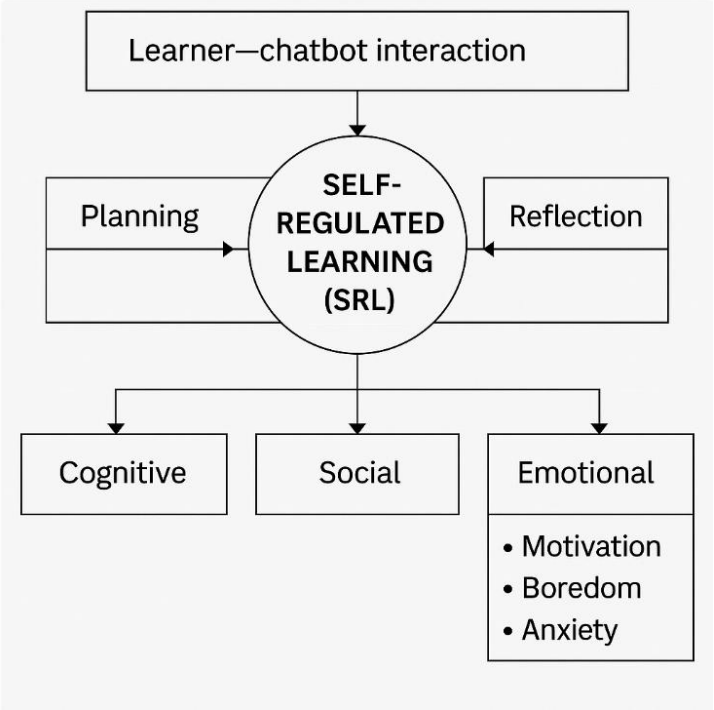
Understanding this potential is vital for both theoretical development in CALL and practical implementation in language classrooms.



One concern driving this research is that while AI can personalize learning, it might also undermine learner agency if not used carefully. Self-regulated learning has long been recognized as a critical component of successful L2 acquisition, closely related to concepts of learner autonomy in language education. SRL refers to learners' ability to proactively set goals, employ strategies, monitor progress, and reflect on outcomes in their learning journey. In educational psychology, Zimmerman's cyclical model of SRL describes forethought (planning and goal-setting), performance (strategy implementation and self-monitoring), and self-reflection (self-evaluation and adaptation) as key phases of this process. Effective L2 learners often exhibit strong self-regulation – for example, they plan practice schedules, seek out resources, self-monitor their comprehension, and adjust tactics when facing difficulties. Generative AI chatbots present an opportunity to scaffold these behaviors by acting as always-available conversational partners and intelligent assistants. Unlike earlier rule-based chatbots that followed scripted responses, modern GenAI models dynamically generate responses tailored to the learner's input, enabling more natural and flexible interactions. This adaptivity allows the chatbot to function almost like a *virtual tutor*, providing instant explanations, personalized examples, and feedback at the learner's request. As a result, learners can engage in deliberate practice with guidance, potentially strengthening their capacity to regulate their own learning outside of formal classes.

Figure 1. *An integrative framework from Jalambo, Çakmak, and Akhter (2025) illustrating how self-regulated learning (SRL) is the core mechanism linking learner–chatbot interaction with cognitive, social, and emotional dimensions of L2 vocabulary learning. Generative AI chatbots operate within this framework as interactive tools that can facilitate SRL processes (planning, strategy use, reflection) while also influencing affective factors like motivation, boredom, and anxiety in language study.*

The use of GenAI chatbots in L2 learning aligns with several established theories. From a constructivist and sociocultural perspective, chatbots enable interactive, context-rich practice that can scaffold learners within their zone of proximal development, much as human interlocutors do. Behaviorist principles are also invoked when chatbots provide immediate feedback and repetitive

drills for reinforcement. Notably, self-determination theory (SDT) suggests that learning tools which support a learner's sense of autonomy, competence, and relatedness can boost intrinsic motivation (Ryan & Deci, 2000). AI chatbots may satisfy some of these needs by allowing learners to control the pace and content of practice (autonomy), by adjusting difficulty to match competence, and by simulating conversational partners that make practice feel less isolating. Recent studies have indeed begun to examine how chatbot use fulfills these psychological needs. For example, Huang and Chueh (2022) found that college students using a chatbot for oral practice felt more competent in pronunciation, and Wu et al. (2022) reported that institutional support for chatbot use improved learners' engagement (through social relatedness). Meanwhile, self-regulated learning theory provides a direct lens: an AI chatbot can prompt goal-setting in the *forethought* phase, serve as a strategy enabler and feedback source during *performance*, and offer tools for self-assessment in the *reflection* phase. Because chatbots are interactive and on-demand, they inherently encourage learners to take initiative – for instance, a student might ask the chatbot to explain a grammar rule or create a quiz, thereby actively steering their learning process. This immediacy and responsiveness of GenAI tools have been highlighted as key affordances that can significantly enhance SRL. In sum, theoretical groundwork suggests that generative AI chatbots could be powerful mediators of both the cognitive and metacognitive aspects of language learning.

Initial research and practice are yielding promising evidence of this potential. A growing number of studies since 2023 – spurred in large part by the public release of ChatGPT – have explored AI chatbots in language education. Many focus on English as a Foreign Language (EFL) contexts, though interest spans various L2 settings. These works range from case studies of chatbot-facilitated speaking practice to experimental interventions for vocabulary learning. A systematic review by Xia et al. (2026) found that across 73 recent studies, GenAI-based interventions frequently center on chatbots as the tool to support SRL activities, reflecting the dominance of conversational AI in this space. Concurrently, meta-analyses have started quantifying impact: one meta-analysis of 31 studies reported that chatbots yield a moderate overall effect (e.g., $g \approx 0.6$) on L2 learning outcomes. Empirical findings attribute these gains to features that chatbots uniquely provide, such as *adaptive personalization*, *24/7 availability* for practice, and *reduced inhibition* for learner output. For instance, Fryer et al. (2020) envisaged chatbots as "the perfect language-learning partner," enabling practice "anywhere, anytime and at our own pace". While that vision was speculative in 2020, today's generative chatbots are much closer to realizing it, thanks to dramatic improvements in natural language understanding and generation. Learners can now converse with AI in the target language on virtually any topic, receiving instant answers and context-specific feedback, which was not feasible with older CALL software or pre-trained rule-based bots.

Despite this optimism, critical voices caution about the *challenges and uncertainties* surrounding AI in education. Some worry that over-reliance on AI tools might diminish learners' critical thinking or lead to problems like academic dishonesty and reduced human interaction. There is also a lack of consensus on the long-term impacts of GenAI on learning outcomes, given how new

these tools are and the mixed results of initial studies. As Van der Graaf et al. (2022) note, research is still nascent and findings vary widely, indicating the need for more nuanced investigation. Within the domain of L2 learning specifically, questions remain about how to best integrate chatbots into curriculum and how learners' self-regulatory skills evolve with prolonged chatbot use. The present article addresses these gaps by examining current research on generative AI chatbots in CALL with a focus on self-regulated L2 learning. Our aim is to synthesize theoretical perspectives and empirical evidence to clarify *how adaptive chatbots can enhance (or in some cases hinder) self-regulated language learning*. We follow an IMRAD structure: describing our methods of literature selection, presenting key results from recent studies and models, and discussing implications for theory, practice, and future research in CALL. In doing so, we maintain an academic tone and draw broadly on L2 learning contexts, highlighting practical insights for educators and researchers interested in leveraging AI chatbots as tools for fostering autonomous, effective language learning.

Methods

Literature Search and Selection

This article is based on a comprehensive review of academic literature rather than new empirical data collection. We systematically gathered relevant scholarly sources published in the last several years (primarily 2018–2025) that intersect the topics of *generative AI/chatbots*, *second language learning*, and *self-regulated learning*. To ensure broad coverage, we searched multiple databases including Web of Science, Scopus, ERIC, and Google Scholar. Key search terms were used in combination, such as "AI chatbot AND language learning", "chatbot AND self-regulated learning", "generative AI AND L2", and "CALL AND autonomy". We also reviewed the reference lists of prominent papers and recent review articles to identify additional studies (snowball sampling). Particular emphasis was placed on peer-reviewed journal articles and conference papers that provided empirical findings or theoretical models on the use of AI-driven chatbots for language learning. Given the rapid emergence of GenAI tools (notably post-2022), we included studies up to and including early 2025 to capture the latest developments.

Our inclusion criteria were: (1) the study or article explicitly involved L2 learners (any target language, though English was most common) using an AI-based conversational agent or chatbot; (2) it examined outcomes or behaviors related to self-regulated learning (e.g. learner autonomy, strategy use, motivation, affect) or provided relevant theoretical insight; and (3) it was published in English in an academic outlet. We intentionally took a broad view of "self-regulated learning" to encompass overlapping concepts in L2 pedagogy such as *learner autonomy*, *self-directed learning*, and *metacognitive strategy training*. We excluded studies focusing solely on chatbots for first-language learning or those not addressing learning processes (e.g. articles about chatbot technical design without pedagogical evaluation).

The initial search yielded over 100 candidate sources, which were then screened based on abstracts and relevance. After removing off-topic or redundant works, we selected approximately 30 core sources that offer a representative and substantive view of the research problem. These include

recent systematic reviews, meta-analyses, experimental studies, case reports, and conceptual papers. Where available, we prioritized open-access publications to accurately extract details and data. Throughout the review process, care was taken to ensure that our analysis remains evidence-based – drawing on reported data or theoretical arguments from these sources – and to preserve the context of findings (e.g. noting if a positive result occurred in a vocabulary learning scenario with university EFL students, etc.). No human subjects were directly involved in this review; thus, ethical approval was not applicable. However, we relied on the fact that all empirical studies referenced had undergone their own ethical procedures (e.g. informed consent, privacy safeguards) as reported by their authors.

Analytical Approach

We employed a narrative synthesis approach to analyze and integrate the literature. Rather than a quantitative meta-analysis, this approach allowed us to qualitatively identify major themes and linkages across studies from different contexts. We first categorized the literature into thematic groups corresponding to our research focus: for example, *"Chatbots for vocabulary and grammar practice"*, *"Chatbots for speaking and conversation"*, *"Effects on learner motivation and affect"*, and *"Theoretical models of SRL with AI"*. Within each category, we compared findings on how chatbot interactions influenced L2 learning outcomes and SRL-related variables (such as use of strategies, self-efficacy, boredom levels). We paid special attention to studies that explicitly measured aspects of self-regulation – e.g. tracking students' strategy use, autonomy, or reflective behaviors when using chatbots.

To strengthen the theoretical foundation, we also incorporated seminal works on SRL (Zimmerman, Pintrich, Winne & Hadwin models) and on CALL pedagogy, connecting these with the insights from the AI-focused studies. During analysis, an iterative process was used: as themes emerged (e.g. *the role of feedback*, *emotional engagement*), we revisited the literature to seek confirmatory or divergent evidence. Where possible, we synthesized results across multiple studies to draw broader conclusions – for instance, noting consistent improvements in vocabulary retention associated with chatbot use in several independent trials. In presenting the results, we use an IMRAD-compatible format: we describe what the literature collectively indicates ("Results") and then interpret and discuss what these findings mean for the field ("Discussion"). All sources are cited in APA style and listed in the References. Any tables or examples included are derived from the reviewed literature or are hypothetical illustrations based on reported practices, and are clearly indicated as such.

Results

Chatbots as Adaptive L2 Learning Tools in CALL

Generative AI chatbots have rapidly become versatile tools in L2 learning, demonstrating the ability to function as interactive conversation partners, intelligent tutors, and even as simulators of immersion. The literature shows that these chatbots can support a range of language skills and sub-

skills, often with positive outcomes for learners. One clear advantage is the provision of *personalized, immediate feedback* across modalities. For example, in Mandarin Chinese learning, AI chatbots have been used for real-time conversation practice with automatic pronunciation correction, grammar suggestions, and vocabulary expansion. Learners receive on-the-spot corrections in their target language output (e.g. if a learner misuses a word or structure, the chatbot can gently provide the correct form or a clarification), which helps them notice gaps in knowledge and rectify errors. This instant feedback loop is difficult to achieve in traditional classroom settings where teacher attention is limited. Moreover, chatbots can be available 24/7, enabling distributed practice; a student can practice speaking or writing at any time and get a response, which is especially valuable for self-study.

Empirical evidence underscores these benefits. In a recent meta-analysis of studies on AI chatbots for language learning, medium effect sizes were found in favor of chatbot-assisted instruction on overall L2 proficiency. These effects span multiple domains: vocabulary acquisition, speaking fluency, reading comprehension, and more. For instance, *vocabulary learning* has seen particularly robust gains. Jalambo et al. (2025) conducted a quasi-experimental study with 187 EFL learners focusing on self-regulated vocabulary practice via generative chatbots. Over an 18-session intervention, the experimental group used chatbots to practice new words and collocations through quizzes and contextual dialogues, while a control group studied the same material without AI support. The chatbot group significantly outperformed the control in post-test scores for both single-word vocabulary and collocational phrases, indicating greater retention and depth of knowledge. Notably, these students also reported lower levels of boredom and higher engagement, suggesting that the interactive nature of the chatbot kept them more motivated than the traditional exercises. Qualitative follow-up interviews from the study revealed themes of increased *learner autonomy* – students felt empowered to continue learning beyond the classroom, using the chatbot to explore additional vocabulary on their own. They also appreciated the chatbot's personalized and patient responses, which made practicing less intimidating.

Similarly, other studies have documented gains in language skills through chatbot use. For speaking skills, Qiao and Zhao (2023) found that Chinese EFL students who engaged in regular AI chatbot conversations showed improved oral fluency and a reduction in foreign language speaking anxiety compared to those who practiced via conventional methods. The chatbot offered a safe space for spoken practice, allowing students to rehearse dialogues, receive corrections, and build confidence without fear of judgment. In a related vein, writing skills have been addressed by using GenAI chatbots like ChatGPT for feedback on compositions. Nikolopoulou (2024) notes that systems such as ChatGPT are being used to provide formative feedback on student writing – for example, by suggesting more natural phrasing or pointing out grammatical errors in an essay draft. This immediate, detailed feedback helps learners self-edit and learn from mistakes, which is a key self-regulatory practice in writing. Preliminary reports indicate that students value the chatbot's input as a complement to teacher feedback, especially for iterative improvements during drafting.

A salient feature across these successful implementations is adaptivity. GenAI chatbots can tailor their responses to the learner's proficiency level and learning needs, essentially delivering *differentiated instruction*. If a learner is a beginner, the chatbot can simplify its language and provide more scaffolding (e.g. giving translations or extra examples), whereas with advanced learners it can engage in more complex, open-ended dialogue. This adaptivity was previously lacking in rule-based CALL programs which often had one-size-fits-all content. Research by Okonkwo and Ade-Ibijola (2022) highlighted that educational chatbots encourage personalized learning and instant support, serving as readily accessible knowledge repositories that students can query at will. In doing so, chatbots align with the CALL principle of *learner-centeredness*, where instruction is adjusted to individual pace and style. Table 1 provides concrete examples of how an AI chatbot might adapt to different learners or tasks in an L2 context:

Scenario	**Chatbot Adaptation and Support**	**Example Interaction**
Beginner practicing vocabulary	Provides simple definitions, usage in a basic sentence, and translation for new words. Offers gentle corrective feedback on errors.	Learner: What does "libro" mean? Chatbot: "Libro" means "book" in Spanish. *El libro está sobre la mesa* (The book is on the table). Can you try making a sentence with "libro"?
Intermediate practicing conversation	Engages in dialogue on familiar topics, adjusts complexity of questions to learner's responses, rephrases when learner is confused.	Learner: I went to the market yesterday. Chatbot: That's great. What did you buy at the market? Learner: I buyed some fruit. Chatbot: *I bought some fruit.* Good! Which fruits did you buy?
Advanced practicing writing	Acts as a writing coach: analyzes input text, points out nuanced errors or suggests more native-like phrasing. May switch to target language explanations for immersion.	Learner: *One of my friend told me an interesting anecdote.* Chatbot: In your sentence, "One of my friends told me an interesting anecdote." Remember to use plural "friends" after "one of". Also, you might say "shared an interesting anecdote" for more natural phrasing.

Table 1. *Examples of adaptive chatbot support in various L2 learning scenarios. The chatbot can simplify or elaborate language as needed and provide immediate feedback, thereby scaffolding the learner's practice while encouraging self-correction and extension of output.*

Overall, these examples and findings illustrate that generative AI chatbots are proving to be effective, flexible learning partners in CALL. They not only help improve specific language skills but also promote good learning habits like frequent practice and experimentation with language use. Importantly, the non-judgmental, patient nature of an AI tutor encourages learners to take risks with using the language – a critical factor in language acquisition. By engaging learners in interactive tasks (conversations, quizzes, story-telling, etc.), chatbots keep the learning process active rather than passive, which can deepen retention (as evidenced by gains in *incidental vocabulary learning* when learners encounter new words in context-rich chatbot dialogues). The

next sections delve into how these tools specifically influence learners' self-regulatory behaviors and motivational or emotional states, which are crucial for sustaining long-term language study.

Fostering Self-Regulated Learning Behaviors

A central question is how generative AI chatbots affect the self-regulation of L2 learners. Do these tools simply provide external support, or do they actively cultivate learners' ability to plan, manage, and reflect on their learning? The emerging consensus is that well-designed chatbot interactions can *reinforce and even train SRL skills* in learners. Several studies have explicitly measured SRL-related outcomes and report encouraging results.

One way to analyze this is by examining the alignment of chatbot functionalities with the three phases of SRL (forethought, performance, self-reflection). Recent work by Xia et al. (2026) synthesized the literature and identified six pedagogical affordances of GenAI tools mapped to SRL phases. In the context of L2 learning with chatbots, these affordances manifest as follows:

- Forethought (Planning & Goal-Setting): Chatbots can help learners set personalized learning objectives and plan activities. For example, a learner might ask the chatbot to help create a weekly study plan or to recommend strategies for improving listening skills. The chatbot might respond by outlining a schedule (e.g. "Practice speaking with me for 10 minutes each day, and try a reading exercise every other day") or suggesting resources (videos, articles) matched to the learner's level. By articulating goals to the chatbot, learners are effectively engaging in the forethought phase. The chatbot also helps break down large goals into actionable steps – for instance, prompting the learner to set sub-goals ("learn 10 new words this week") and reminding them of these goals later. This guidance fosters *metacognitive planning*, an essential SRL component.

- Performance (Implementing Strategies & Monitoring): During learning, chatbots act as strategy enablers and monitors. They can recommend specific learning strategies (such as mnemonic techniques for vocabulary or prompting the learner to summarize a text they read). As learners practice, the chatbot provides feedback that helps learners monitor their performance. For example, in a grammar practice session, if a learner consistently makes a certain error, the chatbot might highlight that pattern ("I've noticed you struggle with past tense forms, let's review that") – effectively cueing the learner to pay attention and adjust strategy (perhaps by practicing more or using a rule reminder). Because the chatbot is interactive, learners can also *seek help* on demand (an important self-regulatory strategy). Instead of passively getting answers, learners must pose questions or ask for clarification, which engages self-monitoring: the learner identifies what they don't understand and takes action to resolve it. Hao et al. (2025) observed that students using an AI chatbot for vocabulary study showed increased use of metacognitive strategies (like self-quizzing, note-taking) compared to a control group. The chatbot frequently encouraged them to recall meanings without immediate help and to reflect on why an answer was wrong, reinforcing

those strategies. In essence, the chatbot's presence guided students to be more systematic and reflective during practice – hallmark behaviors of SRL.

- Self-Reflection (Evaluation & Adaptation): After practice, chatbots can facilitate self-reflection by helping learners evaluate their progress and providing feedback for adjustment. Many AI chatbots can generate short quizzes or summary questions at the end of a session, allowing learners to test themselves. They can also prompt learners with reflective questions like, "How comfortable do you feel now with ordering food in French? Are there phrases you still find difficult?" Such prompts get learners to assess their own learning state. Moreover, chatbots often keep a record of the session (or learners can request a summary of what was covered), functioning as a kind of *learning log*. In some applications, the chatbot might display progress (e.g. "You've learned 50 new words this month") which feeds into the learner's self-evaluation phase. Several studies highlight the value of chatbot-generated performance data. Jeon (2024) demonstrated that a chatbot could produce a diagnostic report on a learner's vocabulary progress, which helped learners identify which word sets needed more review. This practice of reviewing one's own data cultivates an evidence-based self-reflection habit. In an experimental study, Kim (2023) found that after an 8-week chatbot-based intervention, learners not only improved in vocabulary knowledge but also showed greater self-confidence and more frequent use of reflection strategies (like keeping track of mistakes, less anxiety about those mistakes). The chatbot had implicitly taught them to view errors as learning opportunities and to regulate their emotions and tactics accordingly.

Another lens on how chatbots foster SRL is through the concept of learner autonomy. Autonomy in language learning is closely tied to self-regulation – autonomous learners take charge of their learning, from setting goals to selecting resources and evaluating outcomes. AI chatbots can strengthen autonomy by providing a tool that learners control. Because the learner initiates and directs the interaction (e.g. choosing what topics to talk about, what questions to ask, when to practice), they experience a sense of ownership of the learning process. In the study by Jalambo et al. (2025), participants in the chatbot group described feeling more in control of their learning, using phrases like "I can learn anytime, not just when teacher assigns" or "I liked that I could decide what to practice with the chatbot" (as reported in the interview findings). Such sentiments reflect a boost in *perceived autonomy*, an important motivational factor. In turn, autonomy support is linked to higher motivation and persistence. Indeed, several works have noted that chatbot use correlates with increased time spent on voluntary language practice – students were more willing to engage in extra practice sessions with a chatbot than they would typically do as homework. This willingness indicates that when students feel in charge (empowered by an ever-available AI tutor), they self-regulate their time and effort more effectively.

One systematic review (Sardi et al., 2025, as cited in Xia et al., 2026) pointed out that GenAI tools contribute to all three phases of SRL, but especially to the forethought and self-reflection phases which are often hard to foster in learners. Traditional classroom instruction may emphasize the

performance phase (doing exercises, tasks) but not always teach students how to plan or reflect. Chatbots, conversely, often start by asking learners what they want to do (prompting planning) and end by recapping or evaluating (prompting reflection). This built-in structure nurtures SRL skills organically. Lai (2024) went further to propose an adapted SRL framework specific to chatbot usage, defining new "process-action" categories seen in chatbot prompts. For example, Lai identified actions like *defining* (when learners set a learning goal in a prompt), *seeking* (when they ask the chatbot for information or clarification), *engaging* (actively practicing or problem-solving with the chatbot), and *reflecting* (requests that help review or summarize). By analyzing chat logs through this lens, one can see how frequently a learner engages in each SRL process. The initial findings suggest that higher-performing learners tend to have a balanced usage of all these processes – meaning they not only seek answers but also do a lot of defining goals and reflecting in their chatbot interactions (e.g., asking the chatbot to quiz them, or posing follow-up "why" questions to deepen understanding). This kind of analysis underscores that *chatbot interactions can be a window into self-regulation*: the prompts a learner types reveal their level of planning, monitoring, and reflecting. Instructionally, this means educators could train students to use chatbots in a way that hits all these processes (for instance, encouraging students to start a session by stating their goal to the chatbot, and ending by summarizing what they learned).

In summary, generative AI chatbots appear to function not just as passive tools that deliver content, but as active catalysts for self-regulated learning. They invite learners to take initiative, support them through learning strategies, and encourage reflection – effectively weaving SRL into the fabric of day-to-day language practice. However, it is important to note that these positive outcomes often depend on *how* the chatbot is used. If learners only use chatbots to get answers (e.g. to quickly translate or do their homework), the effect on SRL might be negative, fostering dependence rather than autonomy. The studies reporting benefits typically involve scenarios where learners engage *constructively* with the chatbot (solving problems, practicing retrieval, etc.) under some guidance or training. This nuance is crucial and will be revisited in the Discussion when considering best practices.

Learner Engagement, Motivation, and Affective Factors

Beyond cognitive and behavioral aspects, affective factors play a major role in self-regulated L2 learning. Emotions like motivation, confidence, anxiety, and boredom can significantly influence whether learners persist in their studies and how effectively they self-regulate. The introduction of AI chatbots into language learning brings up questions about their impact on these affective dimensions. The research so far indicates a largely positive effect: generative chatbots can increase engagement and enjoyment, and mitigate negative emotions, although certain challenges remain in fully addressing learners' emotional needs.

A consistent finding is that chatbot-based learning tends to be more engaging and enjoyable for students compared to more traditional exercises. The interactive, game-like nature of conversing with a chatbot can turn practice into a fun activity rather than a chore. For example, students often

describe chatbot sessions as feeling like a casual chat or a role-play, which can induce a state of *flow* – a state of focused immersion that is conducive to learning. Flow theory suggests that optimal learning happens when challenges are balanced with skills, and the activity provides clear immediate feedback (all characteristics of a well-tuned chatbot interaction). In line with this, Jalambo et al. (2025) reported that their participants not only experienced less boredom, but many actively looked forward to chatbot sessions and even continued using the chatbot voluntarily after the study ended. The reduction in boredom is particularly noteworthy. Boredom has been identified as a prevalent emotion in language classes that can dampen motivation and impede vocabulary retention. By providing *variety* (chatbots can switch topics or exercise types on the fly) and *relevance* (tailoring content to learner interests), chatbots help sustain attention. One student quoted in an interview (from the same study) mentioned that learning vocabulary through a chatbot felt "like playing a quiz game with a friend" – illustrating how engagement was enhanced.

Anxiety in language learning, especially communicative anxiety, is another critical factor. Speaking or writing in an L2 can be stressful due to fear of mistakes or embarrassment. AI chatbots offer a *low-stakes environment* where learners can practice without judgment. Several studies confirm that this can significantly reduce anxiety. As mentioned earlier, Qiao & Zhao (2023) found decreased speaking anxiety among students using chatbots for oral practice. Likewise, an experiment by Wang and Akhter (2022) (cited in Jalambo et al., 2025) found that chatbot use contributed to emotional regulation by lowering anxiety and frustration during vocabulary tasks. The likely mechanism is that the chatbot's patience and non-human nature remove the social pressure – the learner knows they can take their time, make errors, and the "listener" (the chatbot) will not mock or penalize them. Over time, this repeated comfortable practice can build the learner's confidence to use the language in real conversations. It's important to note, however, that not all types of anxiety are solved by chatbots. Some learners might initially feel *technological anxiety* or distrust interacting with an AI, though this tends to fade as they become familiar with the system (much as one gets used to any software).

Motivation and satisfaction are generally boosted in chatbot-enhanced learning, but research also points out the need to maintain these gains in the long run. Jiang et al. (2025) investigated a large sample of learners across Confucius Institutes in Asia who had used AI chatbots for Mandarin learning. They found that initial motivation to use chatbots was high – many learners were curious and excited by the new technology, seeing it as a useful supplement. The chatbots' strengths like flexible access, personalized help, and novel experience drove positive attitudes (performance expectancy and effort expectancy were high, meaning students believed the chatbot helped them learn efficiently and was easy to use). However, they also discovered a drop-off in continued use over time: only about 27% of students continued using the chatbot after a few months, despite ~68% having tried it initially. The reasons for this attrition are telling – students cited factors such as the chatbot interactions becoming repetitive or less stimulating after the novelty wore off, a lack of emotional warmth (the chatbot, no matter how adept, is still not a human and may respond in mechanically polite ways), technical issues like occasional errors or connectivity problems, and

the fact that the chatbot couldn't fully adapt to all individual differences (some learners felt the chatbot didn't match their learning style or humor). This highlights that *sustaining engagement* is a challenge. The study applied an extended UTAUT and self-determination theory model and concluded that to keep learners motivated, it's crucial for chatbots to meet learners' needs for autonomy and competence continuously, and for educational contexts to provide support and endorsement of chatbot use (so that it's seen as a legitimate part of learning, not a gimmick). The implication is that while chatbots can spark motivation, designers and educators must work to prevent novelty effects from fading. Techniques like periodically updating chatbot content, integrating it with meaningful classroom tasks, and adding elements of adaptive challenge can help maintain interest.

It is also worth noting the role of feedback and praise in motivation. Chatbots can be programmed to give positive reinforcement – e.g. "Great job!" or "You got it right, well done" – which can bolster learners' self-efficacy. Some learners respond well to such encouragement even from a machine, as it provides a sense of accomplishment. On the other hand, if a chatbot's feedback is too blunt or too frequent, it could backfire (for instance, constantly pointing out errors without context can be demotivating). Therefore, the tone and frequency of feedback must be calibrated. Researchers like Woo & Choi (2021) have suggested incorporating more affective computing elements into language chatbots, enabling them to detect user emotions (perhaps via text sentiment or, in advanced cases, voice tone) and respond with empathy. This is still an emerging area – most current chatbots do not deeply sense user affect, but it's a frontier that could make AI interactions more emotionally supportive.

In summary, the affective outcomes reported in the literature are largely positive: more enjoyment, less boredom, reduced anxiety, and initial boosts in motivation when learning with AI chatbots. These contribute to an environment where learners are more likely to self-regulate effectively because they feel comfortable and invested in learning. A relaxed, motivated learner is more prone to set ambitious goals, persevere through challenges, and reflect on improvements – all aspects of SRL. However, sustaining these affective benefits requires careful attention to chatbot design and integration. If not addressed, certain limitations (lack of human touch, repetitive behavior, etc.) can diminish the long-term efficacy of chatbot use. The Discussion section will further explore strategies to handle these challenges and ensure that generative AI chatbots remain a positive force in L2 learning without unintended downsides.

Discussion

Integration of Theoretical Perspectives

The findings from recent literature illustrate a multifaceted impact of generative AI chatbots on L2 learning, particularly through the lens of self-regulated learning. To interpret these results, it is useful to revisit the theoretical frameworks and see how they converge in this context. Zimmerman's SRL model (with phases of forethought, performance, self-reflection) provides a strong explanatory backbone: chatbots can serve as an agent embedded in each phase, prompting

forethought (goal-setting dialogues), aiding performance (strategy use and feedback), and facilitating reflection (post-activity summaries and assessments). This essentially positions the chatbot as a *mediating tool* within a social-cognitive theory of self-regulation – the learner remains at the center, but the chatbot augments the learner's capacity to carry out self-regulatory activities. Bandura's notion of reciprocal determinism (interaction between person, behavior, environment) can be invoked here: the chatbot is part of the learning environment that influences behavior (learning actions) and personal factors (motivations, self-efficacy), while the learner's inputs (behavior) also shape the chatbot's responses (environment changes), creating a feedback loop. Thus, from a social cognitive perspective, AI chatbots might be seen as extensions of the social environment – not human, but interactive enough to count as social models or partners that can reinforce self-regulatory behavior.

From the standpoint of language pedagogy theory, these results align with the concept of *learner autonomy*. Holec's classic definition of autonomy (the ability to take charge of one's learning) and later work by Little and others emphasize that autonomy is fostered when learners have the tools and opportunities to self-direct. AI chatbots can be conceptualized as powerful *tools for autonomy*: they provide resources (knowledge, practice opportunities) that learners can wield independently. Importantly, the autonomy fostered here is not absolute self-isolation, but rather supported autonomy, sometimes called guided self-regulation. The teacher's role shifts to training learners in how to use the chatbot effectively (for example, instructing students on writing good prompts to elicit helpful answers, or on critically evaluating the chatbot's output). In practice, this could mean integrating chatbot-based tasks in homework with guidelines (e.g. "Ask the chatbot to role-play a travel scenario with you, then reflect on new phrases you learned"). Over time, the scaffolding can be removed as learners become adept at using the chatbot on their own. This aligns with Vygotsky's sociocultural theory – initially, the AI can function as a form of scaffolding within the learner's ZPD, and gradually learners internalize some of those functions (e.g. learning to ask themselves reflective questions that the chatbot used to ask them). The Integrated Theoretical Framework shown earlier (Figure 1) from Jalambo et al. embodies this convergence: SRL is at the center, with emotional, cognitive, and social angles all linked by the chatbot's role.

Another relevant model is Self-Determination Theory (SDT) which highlights autonomy, competence, and relatedness. The reviewed studies suggest that chatbots, when used properly, satisfy the needs for autonomy (the learner decides how to engage with the chatbot) and competence (the chatbot's adaptive feedback helps the learner feel a sense of progress/mastery). Relatedness is trickier since interacting with an AI is not the same as with a human peer or teacher. However, some students do ascribe a kind of persona to chatbots, referring to them as if they were learning partners. Designers have experimented with giving chatbots a friendly personality or even a cartoon avatar to increase a sense of social presence. This can partially address relatedness by making the interaction feel more personal. The Unified Theory of Acceptance and Use of Technology (UTAUT), applied by Jiang et al. (2025), further complements SDT by showing that students' continued engagement depends on both cognitive appraisals of the technology

(usefulness, ease of use) and affective factors (satisfaction, motivation). In essence, if the chatbot is seen as useful for achieving their language goals and not too troublesome to use, and if it makes them feel more motivated and satisfied with learning, they will likely continue using it. This integrated cognitive-affective model reinforces the need to consider *user experience design* in educational chatbots – it's not just about language content, but also about how using the tool makes the learner feel and perceive their learning.

In terms of CALL theory, Levy and Stockwell (2006) emphasized that technology should be *pedagogically sound* and not used for its own sake. The evidence here supports that chatbots yield benefits *when integrated with sound pedagogy*. For example, the studies where instructors had clear goals for chatbot use (like practicing specific strategies, or focusing on incidental learning) saw positive outcomes. On the contrary, if a chatbot is used haphazardly, learners might not naturally engage in deep self-regulation – they might just treat it as a fun gadget or, worse, use it to cheat (e.g., getting answers without attempting problems). This underscores a key point: the technology itself doesn't automatically guarantee better self-regulation or learning – it must be aligned with an instructional design that promotes those outcomes. Teachers and course designers have a vital role in setting the stage for productive chatbot use, perhaps by modeling self-regulatory interactions with the chatbot (demonstrating in class how to ask the chatbot to explain something or to reflect on an error) and by creating assignments that require students to use the chatbot in a thoughtful manner.

Practical Implications for Educators and Developers

The confluence of results suggests several practical implications for those looking to deploy generative AI chatbots in language education:

- Train Students in Effective Chatbot Use: Students may not initially know how to use a chatbot as a learning tool (beyond simple Q&A). Educators should provide guidance or training sessions on crafting productive prompts (for instance, showing that asking "Can you explain the difference between *ser* and *estar* in Spanish with examples?" yields a more useful response than just "What's ser vs estar?"). Encouraging students to *set goals* in their prompts ("I want to practice ordering food") and to *reflect* ("Can you quiz me now on what I learned?") can directly cultivate SRL habits. If students learn to approach the chatbot with a plan (forethought) and close sessions with reflection, they will likely benefit more. Teachers can even share prompt templates (e.g., "Tell the chatbot: 'I struggle with listening comprehension. Give me a short dialogue to practice and some questions after.'") to scaffold initial usage.

- Blend Chatbots with Classroom Activities: Rather than isolating chatbot use as an extracurricular novelty, it can be blended into the curriculum. For example, for a writing assignment, a teacher might have students draft an essay, use ChatGPT or a similar chatbot to get feedback and suggestions, revise their essay, and then submit both drafts and a reflection on how the chatbot's feedback was used. This not only enriches the learning

activity but also lets the teacher monitor and discuss the process, ensuring academic integrity and learning value. Similarly, in speaking classes, students could be assigned to practice with a chatbot and then perform a similar task in class, reflecting on differences. This approach uses the chatbot to *extend practice time* and *individualize learning*, while the classroom provides human interaction and verification of skills. When students see the chatbot as an integrated tool in their learning (endorsed by the teacher), their motivation to use it purposefully will be higher.

- Address Emotional and Motivational Aspects: Educators and developers should be mindful of the affective experience. To tackle the *novelty fade* and retention issue noted in longer-term use, developers could introduce features that maintain engagement – such as gradually increasing task difficulty to match growing competence (keeping the challenge level optimal) or adding variety (new scenarios, gamified elements like points or badges for milestones achieved via chatbot practice). For the emotional side, one idea is to allow a bit of personalization of the chatbot's persona. If a learner can choose a profile for their chatbot (formal tutor vs. friendly peer, etc.), they might feel more connected. Even simple touches like the chatbot remembering the learner's name, or referencing past conversations ("Last week you told me you were studying past tense, how is that going?") can increase a sense of relatedness and care. These features would help the chatbot provide not only cognitive support but also some motivational scaffolding. On the educator's end, acknowledging students' achievements via chatbots (e.g., "I see from your chatbot logs you practiced 5 times this week, great job taking initiative!") can validate their self-directed efforts and reinforce them.

- Ensure Quality and Accuracy of Chatbot Content: A practical concern is that AI-generated content can sometimes be incorrect or misleading (the phenomenon of AI "hallucinations"). This can harm learning if not checked. Therefore, it's advisable that any official deployment of chatbots in a course includes a mechanism for verification. For instance, teachers might restrict the chatbot's knowledge domain or use a specialized language-learning chatbot that has been vetted for accuracy in explanations. Alternatively, when students use a general chatbot like ChatGPT, they should be taught critical thinking: double-check definitions or examples the chatbot gives (perhaps cross-reference with a textbook or ask the chatbot for sources). Some educators have students bring interesting or dubious chatbot outputs to class for discussion, which turns potential misinformation into a learning opportunity (teaching digital literacy). Additionally, privacy should be considered – if students are using third-party AI services, ensure they do not input sensitive personal data, and choose platforms that comply with student data protection standards.

- Monitor and Support SRL Development: Teachers can use the data from chatbot interactions as a form of learning analytics to support students. As Lai (2024) demonstrated, analyzing the types of prompts can reveal a student's level of engagement in SRL processes. If a student never asks the chatbot reflective questions or only uses it to translate,

the teacher might intervene and coach them towards deeper use. Some language learning platforms with built-in AI tutors might provide dashboards showing how students interact (e.g., how many practice exercises they attempted, topics covered, etc.). Educators should periodically review these and give meta-feedback – for example, praising a student for consistent practice, or advising a student who used the chatbot minimally on how to better incorporate it into their study routine. In this way, the technology also becomes a tool for teachers to *personalize their guidance*, focusing on those who might need a nudge towards more self-regulation.

Limitations and Future Directions

While the integration of generative AI chatbots in L2 learning shows much promise, it is not without limitations and open questions. First, many of the current studies have been short-term or pilot implementations. Longitudinal effects on language proficiency and SRL skills are still not well-documented. It remains to be seen whether the gains observed (e.g., improved vocabulary, confidence) sustain and continue to grow over time, or whether there's a plateau. Future research should examine semester- or year-long use of chatbots, tracking not just language outcomes but also changes in learners' self-regulatory behaviors over time. For example, do students gradually internalize strategies they initially learned via chatbot prompts? Do they become more independent from the chatbot as they grow more skilled, or conversely, do they become overly reliant? These are important for understanding the long-term role of AI in learning.

Another limitation is sample bias in existing research. A large proportion of studies have been conducted in specific contexts (Chinese or Asian EFL learners, often university level). Learners in different contexts – young learners, less tech-savvy adult learners, or learners of languages less commonly supported by AI – might experience different outcomes. It would be valuable to study diverse language pairs (say, Americans learning Arabic, or primary school students learning English with a simplified chatbot) to see if the effects generalize. Also, differences in learner characteristics (like their inherent self-regulation ability, learning styles, or attitudes toward technology) can mediate the effectiveness of chatbots. Some evidence already suggests high-metacognitive-awareness learners leverage chatbots more effectively. Thus, personalization not just in content, but in approach (maybe the chatbot could adapt its style to learners who need more motivational support vs. those who prefer straightforward instruction) could be explored.

There are also open questions about the instructional role of teachers in an AI-rich learning environment. How can teachers best orchestrate human and AI resources? Professional development will be needed so that language teachers understand the capabilities and limitations of AI chatbots. When teachers are well-informed, they can better integrate these tools and also address issues like academic honesty (e.g., ensuring students aren't using AI to bypass learning, such as by writing entire essays for them without effort – this requires setting clear policies and perhaps using AI detection tools or assignments that require process evidence). Ethically, the use of AI in learning raises considerations: equity (do all students have equal access to these tools?),

privacy (as noted, what happens to the data?), and the importance of maintaining the human element in education. The goal is to use chatbots to *augment* human teaching, not replace it. Several authors emphasize that AI should free up teachers from routine tasks so they can focus on higher-order mentoring – for instance, if a chatbot can handle repetitive practice with a student, the teacher can use class time for communicative activities, cultural discussions, or personalized feedback that AI cannot provide as meaningfully.

From a development perspective, improving chatbot design for language learning is an ongoing pursuit. Collaboration between computational linguists, AI engineers, and language educators is key. Future chatbots might incorporate multi-modal capabilities (e.g., speaking with voice, understanding speech, maybe even having a virtual face) to simulate conversational practice more authentically. There is also potential for integrating explicit pedagogical frameworks: for example, a chatbot that follows the CEFR (Common European Framework of Reference) levels to ensure its vocabulary and grammar align with the learner's level, or one that uses spaced repetition algorithms to reinforce words at optimal intervals. One can imagine "intelligent tutoring system" hybrids – chatbots that don't just respond, but proactively guide a learner through a curriculum, while still allowing natural interaction. Early steps of this are visible in some research prototypes, but more work is needed to evaluate their effectiveness.

Finally, as generative AI evolves (e.g., more advanced models, perhaps domain-specific language learning models), continuous research is needed to monitor its pedagogical impact. The field must remain critical and evidence-driven. It will be important to not be swept up by hype – rigorous studies comparing AI-assisted learning with traditional methods, as well as qualitative research into student experiences, will provide grounding. In addition, involving learners' voices will be valuable: what do *students* perceive as the benefits or drawbacks of using a chatbot? Their feedback can drive user-centered improvements.

Conclusion

Generative AI chatbots represent a significant innovation in the CALL landscape, offering opportunities to enhance self-regulated L2 learning through adaptive, interactive engagements. The literature reviewed in this article indicates that when leveraged thoughtfully, these chatbots can serve as *always-available conversational partners, tutors, and catalysts for autonomous learning*. They have demonstrated the ability to improve language outcomes (from vocabulary retention to oral fluency) while also supporting the development of self-regulatory skills such as goal-setting, strategic practice, and self-reflection. Learners often respond positively to the personalized feedback and freedom these AI tools provide, showing increased motivation, confidence, and willingness to practice beyond classroom confines. At the same time, the introduction of AI does not diminish the importance of sound pedagogy and the human element. On the contrary, it challenges educators to integrate technology in ways that truly empower learners – guiding them to use chatbots as a means to take more control over their learning rather than less.

In closing, the synergistic relationship between generative AI and self-regulated learning holds much promise. By aligning AI chatbot capabilities with established educational principles, we can create rich, student-centered learning ecosystems. In such an ecosystem, a student might seamlessly shift between interacting with their AI chatbot (practicing conversation, getting instant help) and interacting with peers or teachers (engaging in meaningful communication and receiving mentorship), with each component reinforcing the other. The chatbot becomes a tool to practice and prepare, the classroom becomes a place to apply and extend, and the student is at the helm, charting their language learning journey with confidence. As research continues to illuminate best practices and as technology advances, the vision of AI chatbots as adaptive partners enhancing self-regulated L2 learning is increasingly within reach. The task now is to proceed with both enthusiasm and careful consideration, ensuring that these tools are accessible, effective, and used in service of empowering learners around the world to achieve their language goals.

References:

Adam, M., Wessel, M., & Benlian, A. (2021). AI-based chatbots in customer service and their effects on user compliance. *Electronic markets*, *31*(2), 427-445.

Akhtar, M., Neidhardt, J., & Werthner, H. (2019, July). The potential of chatbots: analysis of chatbot conversations. In *2019 IEEE 21st conference on business informatics (CBI)* (Vol. 1, pp. 397-404). IEEE.

Alisoy, H. (2024). Exploring language acquisition: The role of native language interference in ESL learners. *Journal of Azerbaijan Language and Education Studies*, *1*(1), 50-66.

Alisoy, H. (2024). The magic of languages: Introducing a second language in early childhood education. *Retrieved from ResearchGate: https://doi. org/10.13140/RG*, *2*(11042.81603).

Alisoy, H. (2025). The Role of Using Authentic Videos on Learners' Pronunciation. *Acta Globalis Humanitatis Et Linguarum*, *2*(2), 79-87.

Alisoy, H. A. H. (2023). Object Clauses and Difficulties in Their Translation. Nakhchivan State University. *English and Translation Chair*.

Aydın, Ö., & Karaarslan, E. (2023). Is ChatGPT leading generative AI? What is beyond expectations?. *Academic Platform Journal of Engineering and Smart Systems*, *11*(3), 118-134.

Bail, C. A. (2024). Can Generative AI improve social science?. *Proceedings of the National Academy of Sciences*, *121*(21), e2314021121.

Bandi, A., Adapa, P. V. S. R., & Kuchi, Y. E. V. P. K. (2023). The power of generative ai: A review of requirements, models, input–output formats, evaluation metrics, and challenges. *Future Internet*, *15*(8), 260.

Banh, L., & Strobel, G. (2023). Generative artificial intelligence. *Electronic Markets*, *33*(1), 63.

Chaves, A. P., & Gerosa, M. A. (2021). How should my chatbot interact? A survey on social characteristics in human–chatbot interaction design. *International Journal of Human–Computer Interaction*, *37*(8), 729-758.

Chui, M., Hazan, E., Roberts, R., Singla, A., & Smaje, K. (2023). The economic potential of generative AI.

Dam, S. K., Hong, C. S., Qiao, Y., & Zhang, C. (2024). A complete survey on llm-based ai chatbots. *arXiv preprint arXiv:2406.16937*.

Eisfeldt, A. L., Schubert, G., & Zhang, M. B. (2023). *Generative AI and firm values* (No. w31222). National Bureau of Economic Research.

Eysenbach, G. (2023). The role of ChatGPT, generative language models, and artificial intelligence in medical education: a conversation with ChatGPT and a call for papers. *JMIR medical education*, *9*(1), e46885.

Feuerriegel, S., Hartmann, J., Janiesch, C., & Zschech, P. (2024). Generative ai. *Business & Information Systems Engineering*, *66*(1), 111-126.

Floridi, L. (2023). AI as agency without intelligence: On ChatGPT, large language models, and other generative models. *Philosophy & technology*, *36*(1), 15.

Fui-Hoon Nah, F., Zheng, R., Cai, J., Siau, K., & Chen, L. (2023). Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration. *Journal of information technology case and application research*, *25*(3), 277-304.

Gozalo-Brizuela, R., & Garrido-Merchán, E. C. (2023). A survey of Generative AI Applications. *arXiv preprint arXiv:2306.02781*.

Huang, W., Hew, K. F., & Fryer, L. K. (2022). Chatbots for language learning—Are they really useful? A systematic review of chatbot-supported language learning. *Journal of computer assisted learning*, *38*(1), 237-257.

Jeon, J., Lee, S., & Choi, S. (2024). A systematic review of research on speech-recognition chatbots for language learning: Implications for future directions in the era of large language models. *Interactive Learning Environments*, *32*(8), 4613-4631.

Jo, A. (2023). The promise and peril of generative AI. *Nature*, *614*(1), 214-216.

Kerlyl, A., Hall, P., & Bull, S. (2006, December). Bringing chatbots into education: Towards natural language negotiation of open learner models. In *International conference on innovative techniques and applications of artificial intelligence* (pp. 179-192). London: Springer London.

Kuddus, K. (2022). Artificial intelligence in language learning: Practices and prospects. *Advanced analytics and deep learning models*, 1-17.

Mammadova, I. (2024). Motivational and Practical Frameworks for Teaching English to Weak Learners: An Empirical Study. *Acta Globalis Humanitatis Et Linguarum*, *1*(1), 30-38. https://doi.org/10.69760/aghel.024050

Mohebbi, A. (2025). Enabling learner independence and self-regulation in language education using AI tools: a systematic review. *Cogent Education*, *12*(1), 2433814.

Neumann, A. T., Yin, Y., Sowe, S., Decker, S., & Jarke, M. (2024). An llm-driven chatbot in higher education for databases and information systems. *IEEE Transactions on Education*.

Sadigzade, Z. (2025). Mind the Gap: A Comparative Study of Faculty and Student Readiness for AI-Integrated ELT in Azerbaijani Higher Education. *Global Spectrum of Research and Humanities* , *2*(4), 144-169. https://doi.org/10.69760/gsrh.0250203012

Sadiqzade, Z., & Alisoy, H. (2024). Level-Up Learning: Using Games to Teach English Across Student Levels. *EuroGlobal Journal of Linguistics and Language Education*, *1*(3), 181-194. https://doi.org/10.69760/egjlle.20240104

Sadiqzade, Z., & Alisoy, H. (2025). *Cybersecurity and Online Education–Risks and Solutions. Luminis Applied Science and Engineering, 2 (1), 4-12*.

Seering, J., Luria, M., Kaufman, G., & Hammer, J. (2019, May). Beyond dyadic interactions: Considering chatbots as community members. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-13).

Shafiee Rad, H. (2024). Revolutionizing L2 speaking proficiency, willingness to communicate, and perceptions through artificial intelligence: A case of Speeko application. *Innovation in Language Learning and Teaching*, *18*(4), 364-379.

Wei, L. (2023). Artificial intelligence in language instruction: impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in psychology*, *14*, 1261955.

Yin, Q., & Satar, M. (2020). English as a Foreign Language Learner Interactions with Chatbots: Negotiation for Meaning. *International Online Journal of Education and Teaching*, *7*(2), 390-410.

Zhang, Z., & Huang, X. (2024). The impact of chatbots based on large language models on second language vocabulary acquisition. *Heliyon*, *10*(3).

Zhao, D. (2025). The impact of AI-enhanced natural language processing tools on writing proficiency: An analysis of language precision, content summarization, and creative writing facilitation. *Education and Information Technologies*, *30*(6), 8055-8086.

Zumstein, D., & Hundertmark, S. (2017). CHATBOTS--AN INTERACTIVE TECHNOLOGY FOR PERSONALIZED COMMUNICATION, TRANSACTIONS AND SERVICES. *IADIS International Journal on WWW/Internet*, *15*(1).

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