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SUN’IY INTELLEKTGA ASOSLANGAN CHATBOTLAR IKKINCHI TILNI O‘RGANISHDA INTERAKTIV HAMKOR SIFATIDA: 2020–2025-YILLARDAGI EMPIRIK TADQIQOTLARNING PRISMA-SCR SCOPING SHARHI

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Annotatsiya

So‘nggi yillarda generativ sun’iy intellekt sohasidagi yutuqlar ikkinchi tilni (L2) o‘rganishda suhbatga asoslangan chatbotlardan foydalanishning kengayishiga olib keldi. Ko‘plab tadqiqotlar ijobiy natijalarni qayd etgan bo‘lsa-da, ushbu vositalarning til ko‘nikmalarini rivojlantirish hamda o‘quvchilarning affektiv va kognitiv tajribalariga ta’sir ko‘rsatuvchi interaktiv hamkor sifatidagi funksiyasini umumlashtiruvchi tadqiqotlar yetarli darajada mavjud emas.

Kalit so‘zlar: chatbotlar; generativ sun’iy intellekt; ikkinchi tilni o‘rganish; gapirish; yozish; lug‘at boyligi; xorijiy til tashvishi; metakognitsiya; CALL (Computer-Assisted Language Learning).

ЧАТ-БОТЫ НА ОСНОВЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА КАК ИНТЕРАКТИВНЫЕ ПАРТНЁРЫ В ИЗУЧЕНИИ ВТОРОГО ЯЗЫКА: SCOPING-ОБЗОР ЭМПИРИЧЕСКИХ ИССЛЕДОВАНИЙ (2020–2025) ПО МЕТОДОЛОГИИ PRISMA-SCR

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Аннотация

Последние достижения в области генеративного искусственного интеллекта привели к активному использованию разговорных чат-ботов в обучении второму языку (L2). Несмотря на то что многие исследования фиксируют положительные результаты, по-прежнему отсутствует достаточное обобщение того, каким образом эти инструменты функционируют как интерактивные партнёры, влияющие на развитие языковых навыков, а также на аффективный и когнитивный опыт обучающихся.

Ключевые слова: чат-боты; генеративный искусственный интеллект; изучение второго языка; говорение; письмо; словарный запас; тревожность при изучении иностранного языка; метакогниция; CALL.

AI-POWERED CHATBOTS AS INTERACTIONAL PARTNERS IN SECOND LANGUAGE LEARNING: A PRISMA-SCR SCOPING REVIEW OF EMPIRICAL EVIDENCE (2020–2025)

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Abstract

Recent advances in generative artificial intelligence have led to the growing use of conversational chatbots in second language (L2) learning. Although many studies report positive outcomes, there remains a limited synthesis of how these tools function specifically as interactional partners that influence language skill development and learners’ affective and

cognitive experiences.

Keywords: chatbots; generative ai; second language learning; speaking; writing; vocabulary; foreign language anxiety; metacognition; call.

Interaction has long been recognized as central to second language (L2) development, yet classroom realities often limit learners' opportunities for meaningful practice, timely feedback, and low-anxiety communication. Recent advances in generative artificial intelligence have introduced conversational chatbots that may address these long-standing constraints by enabling sustained learner–system interaction that resembles authentic dialogue.

Viewing chatbots as interactional partners shifts attention away from the technology itself and toward the nature of learner–chatbot dialogue, feedback, and psychological comfort during learning. Such a perspective aligns with established communicative and sociocultural views in language education, where interaction is fundamental to acquisition.

At the same time, persistent challenges remain in language classrooms. Learners often have limited opportunities to practice speaking, receive immediate feedback on writing, or experiment with vocabulary and grammar in low-pressure environments. Anxiety, particularly in speaking activities, continues to affect participation and confidence. In this context, chatbots appear to offer practical support through their constant availability, patient responses, and adaptability to learner input (Alenezi & Alenezi, 2025; Franjić & Božinovski, 2025).

A growing body of empirical research has begun to explore the pedagogical potential of chatbots across speaking, writing, vocabulary, grammar, and reading tasks in diverse educational settings. However, these studies remain fragmented across contexts, chatbot types, and methodological designs, making it difficult to understand how chatbots function systematically within the L2 learning process.

Although previous reviews have examined artificial intelligence in education and chatbots as instructional tools more broadly, few have synthesized empirical evidence that specifically conceptualizes chatbots as interactional partners linked to measurable language learning outcomes. For this reason, a scoping review is needed to identify how chatbots are currently used to support particular language skills, what patterns emerge across studies, and what this implies for language teaching practice.

This study therefore conducts a PRISMA-ScR scoping review to map how AI-powered chatbots are used as interactional partners in L2 learning, identify the language skills they support, and examine patterns across empirical studies to inform language teaching practice.

Interaction in Second Language Acquisition

Interaction has long been viewed as a key mechanism in second language acquisition. Long's (1996) Interaction Hypothesis proposes that learning is facilitated when learners engage in communication that requires negotiation of meaning. Through such interaction, learners receive input, attempt modified output, and notice gaps in their linguistic knowledge. Gass (2003) further argues that these processes promote deeper cognitive processing of language forms.

In classroom settings, however, sustained interaction is often limited by time constraints, class size, and learners' hesitation to speak. AI-powered chatbots can simulate extended conversational exchanges that resemble authentic interaction. Through ongoing dialogue, clarification, and feedback, chatbots create conditions similar to those described in interactionist approaches to SLA, extending opportunities for practice beyond classroom limitations.

From this perspective, chatbots can be understood not merely as tools but as participants in meaning-making processes that support language development through dialogue.

Affective Filter Hypothesis

Krashen's (1982) Affective Filter Hypothesis emphasizes the role of emotional variables such as anxiety, confidence, and motivation in language acquisition. When anxiety is high,

learners are less able to process input effectively, whereas supportive and low-pressure environments allow learners to engage more freely with the language.

Speaking activities are particularly associated with anxiety due to fear of negative evaluation. Chatbots provide a space where learners can practice without this social pressure. Their non-evaluative and patient responses may reduce performance anxiety and encourage greater participation.

This perspective helps explain why many studies report increased willingness to communicate and reduced anxiety even before measurable gains in test performance are observed.

Sociocultural Theory and the Zone of Proximal Development

Vygotsky's (1978) Sociocultural Theory proposes that learning occurs through guided interaction within the Zone of Proximal Development (ZPD). Traditionally, this support is provided by teachers or more capable peers who offer scaffolding and feedback.

Chatbots increasingly perform similar functions by providing explanations, prompts, and corrective feedback tailored to learner responses. This is particularly visible in writing, vocabulary, and grammar tasks where learners receive step-by-step support.

From this perspective, chatbots can be understood as digital mediators that assist learners within their ZPD and support gradual development of linguistic competence. This theoretical framing provides a lens through which the findings of this review can be interpreted.

Method

This study employed a scoping review design to map empirical research on the use of AI-powered chatbots as interactional partners in second language (L2) learning. A scoping review was appropriate due to the emerging and methodologically diverse nature of research in this area. The review followed PRISMA-ScR guidelines to ensure transparency and rigor in study identification, screening, and reporting.

Search Strategy

A systematic search was conducted in the Scopus database, selected for its broad coverage of peer-reviewed research in education, applied linguistics, and educational technology. The search was limited to studies published between 2020 and 2025 to capture research conducted after the emergence of large language model (LLM)–based chatbots such as ChatGPT.

Search terms combined keywords related to chatbots and generative AI with terms associated with second and foreign language learning, including speaking, writing, vocabulary, grammar, reading, and communication. Only peer-reviewed journal articles and conference papers published in English were included. The initial search yielded 257 records.

Screening Process

Screening was conducted in two stages: title and abstract screening followed by full-text review. During the first stage, studies were retained if they clearly involved language learners interacting with a chatbot or conversational AI in a language learning context, reducing the number of records from 257 to 82.

In the second stage, full texts were examined using stricter eligibility criteria. Studies were included if they involved real L2 learners, required direct learner–chatbot interaction, focused on the development of a specific language skill, and reported observable learning outcomes. Studies that focused solely on perceptions, system design, or theoretical discussion without evidence of learner performance were excluded. After full-text screening, 16 studies met all criteria and were included in the review.

Figure 1. PRISMA 2020 flow diagram of study selection

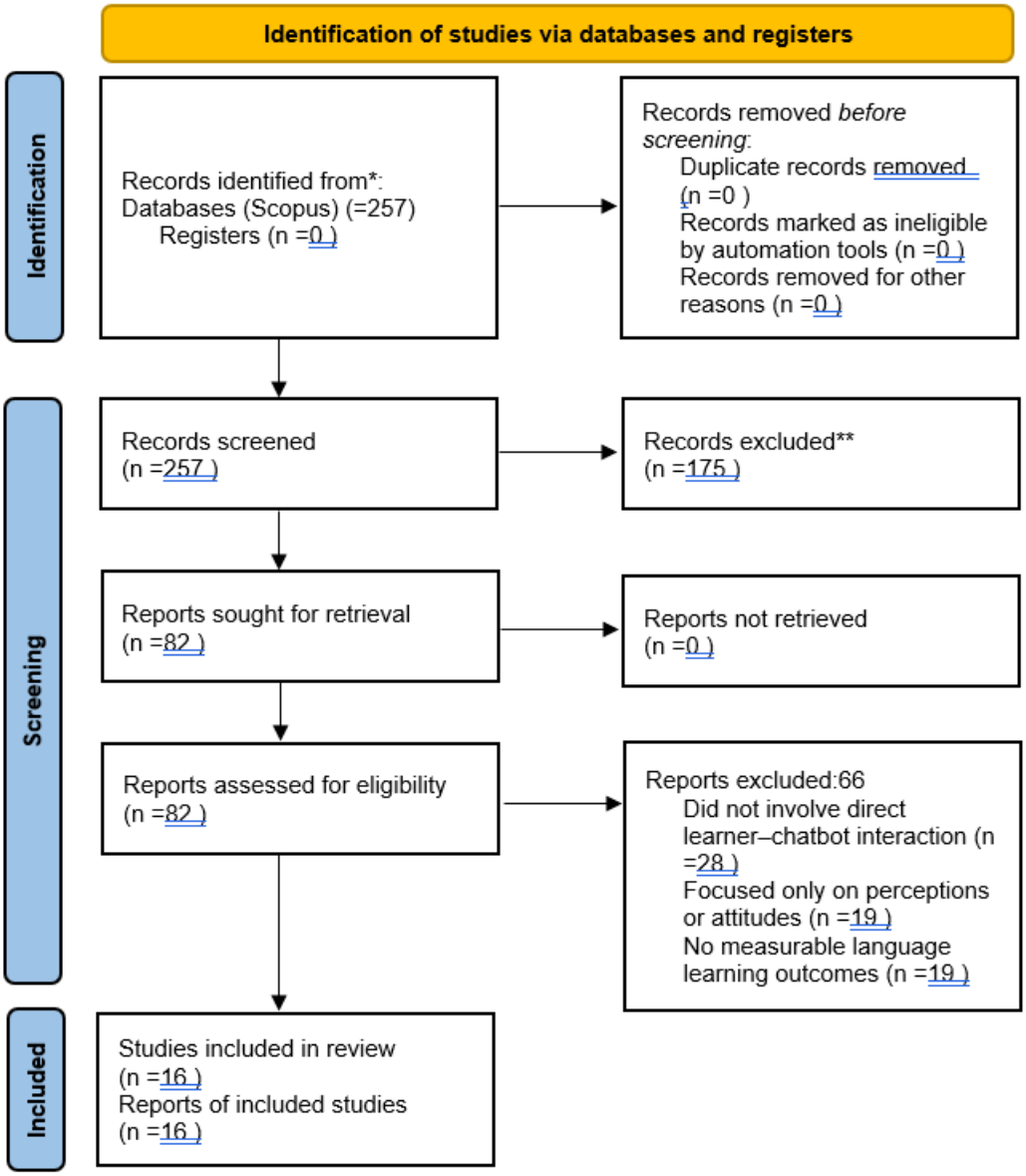

Figure 1. PRISMA 2020 flow diagram illustrating the study selection process for the scoping review.

Inclusion and Exclusion Criteria

Studies were included when they involved L2/EFL/ESL learners, required direct interaction with a chatbot, targeted the development of a specific language skill, and reported empirical learning outcomes. Studies were excluded if they focused only on teacher or student perceptions, were theoretical or design-oriented, used AI tools unrelated to language learning, or examined motivation and attitudes without linking them to language performance.

Data Charting

A structured charting form was developed to extract comparable information from each study. For each article, data were recorded on educational context, participant profile, targeted language skill, chatbot type, research design, outcomes measured, key findings, and reported limitations. This process enabled cross-study comparison and informed the thematic synthesis presented in the Results section.

PRISMA Flow

The search produced 257 records, of which 82 remained after title and abstract screening. Following full-text review, 16 studies were included in the final analysis. The selection process is

illustrated in the PRISMA-ScR flow diagram (Figure 1).

Table 1 presents the characteristics of the 16 empirical studies included in the review, illustrating the diversity of contexts, participants, chatbot types, targeted skills, and research designs across the literature.

Table 1. Characteristics of the 16 empirical studies included in the scoping review

Table 1 summarizes the main characteristics of the studies included in the review and shows the variety of contexts, participants, chatbot types, and research designs represented in the literature.

Results

Analysis of the 16 included studies (Table 1) revealed clear thematic patterns in how AI-powered chatbots function as interactional partners in second language learning. The studies clustered around six major themes: (1) speaking development, (2) writing development, (3) vocabulary and grammar acquisition, (4) reading performance, (5) affective factors in language learning, and (6) metacognitive support and feedback.

Table 1. Characteristics of the included studies in the scoping review

Context (Country / Level)	**Target Skill(s)**	**Chatbot / Tool**	**Study Design**	**Key Outcome**
Taiwan, Grade 7 EFL	Speaking, Writing	GPT chatbot (ClipTalk)	Experimental (8 weeks)	Significant gains in speaking and writing
Saudi Arabia, Secondary	Speaking	GPT chatbot	Quasi-experimental	Strong improvement in speaking performance
Korea, Primary	Engagement	Dialogflow bot	Qualitative (16 weeks)	Increased psychological engagement
Slovenia, ESL	Writing	ChatGPT	Experimental	Improved grammar, vocabulary, coherence
Indonesia, Secondary	Reading	Reading chatbot	Experimental	Reduced reading anxiety, improved performance
Czech Republic, University	General skills	Conversational bot	Pilot experiment	Overall language skill improvement
Russia, University	Speaking, Listening, Writing	AI assistant	Quasi-experimental	Improved communicative proficiency
Turkey, University	Writing, Grammar, Vocabulary	ChatGPT	Qualitative case study	Improved writing and vocabulary use
University EAP	Academic writing	ChatGPT	Mixed methods	Improved grammar and syntax

Indonesia, University	Writing	ChatGPT	Mixed (control/experimental)	Improved writing quality and feedback literacy
Taiwan, University	Linguistic competence	GenAI chatbot	Quasi-experimental	Improved metacognition and achievement
Vietnam, University	Speaking	AI voice chatbot	Quasi-experimental (8 weeks)	Significant gains in speaking fluency
China, University	Vocabulary	LLM chatbot	Experimental	Improved vocabulary acquisition and retention
China, University	Speaking anxiety	Typebot, D-ID avatar	Experimental	Reduced anxiety, increased willingness to communicate
University (Korean L2)	Grammar	“Iruda” chatbot	Semester experiment	Improved grammar performance
Ukraine, Secondary	Speaking	AI chatbot	Pedagogical experiment	Large gains in speaking ability

Chatbots for Speaking Development

The most dominant theme across the studies was the use of chatbots to enhance speaking performance and communicative competence. Six studies reported that conversational AI tools significantly improved learners’ speaking fluency, confidence, and interactional ability.

Research conducted in Saudi Arabia, Vietnam, Ukraine, China, and various school contexts using GPT-powered chatbots, voice-based chatbots, and avatar-supported conversational agents demonstrated measurable improvements in speaking performance. Learners who interacted with chatbots over periods ranging from three to eight weeks achieved higher speaking scores, produced more spontaneous speech, and showed reduced hesitation during communication tasks.

Avatar-based and voice-enabled chatbots were particularly effective in reducing foreign language speaking anxiety and increasing willingness to communicate (WTC). Although some studies reported improvements in affective speaking factors without statistically significant gains in formal speaking test scores, learners consistently reported greater confidence and engagement when practicing with chatbots compared to traditional classroom interaction.

These findings indicate that chatbots create low-pressure, judgment-free speaking environments that promote oral practice and communicative risk-taking.

Chatbots for Writing Development

Five studies examined the use of ChatGPT and similar LLM-based chatbots to support writing proficiency in university EFL and ESL contexts. These studies reported improvements in grammar accuracy, vocabulary use, organization, coherence, and overall academic writing quality.

Experimental and mixed-methods designs showed that learners who used chatbots for writing tasks produced higher-quality texts compared to control groups. Additionally, chatbot interaction enhanced feedback literacy, enabling learners to understand, apply, and reflect on feedback more effectively.

Lower-proficiency learners appeared to benefit the most from chatbot-assisted writing due to the immediate scaffolding and language support provided. One noted limitation was that writing tasks sometimes required more time when learners relied heavily on chatbot interaction.

Overall, chatbots functioned as real-time writing tutors by offering personalized feedback and scaffolding throughout the writing process.

Vocabulary and Grammar Acquisition

Two studies specifically investigated vocabulary and grammar development through chatbot interaction.

An experimental study using LLM-based chatbots demonstrated significant gains in both receptive and productive vocabulary knowledge, including evidence of long-term retention and incidental vocabulary learning. Similarly, a semester-long study employing the “Iruda” chatbot for L2 Korean instruction reported substantial improvements in grammar performance, particularly among lower-proficiency learners.

These findings suggest that chatbots can effectively support form-focused instruction when integrated into structured learning tasks.

Reading Performance and Anxiety Reduction

One study examined the effects of chatbot-assisted assessment on reading performance and reading anxiety among secondary school learners. Students who interacted with reading chatbots demonstrated significantly reduced anxiety and higher reading comprehension scores compared to those in traditional settings.

This indicates that chatbots can also support receptive skills by providing supportive assessment and practice environments.

Affective Factors: Motivation, Engagement, and Anxiety

Several studies highlighted the impact of chatbots on learners’ motivation, engagement, and psychological comfort in language learning.

Qualitative and mixed-methods research from Korea, Indonesia, and China showed that chatbot interaction increased learner engagement, reduced anxiety, and fostered positive emotional experiences. Learners described chatbot interaction as supportive, enjoyable, and less intimidating than human interaction.

This theme closely overlaps with speaking development, where reduced anxiety and increased willingness to communicate were consistently observed.

Metacognitive Support and Feedback

One study introduced a metalinguistic-guidance-based generative AI chatbot that enhanced learners’ metacognitive awareness and reflective performance. Learners receiving metalinguistic feedback through chatbots achieved higher learning outcomes compared to those receiving conventional corrective feedback.

This finding highlights the potential of chatbots not only as practice partners but also as tools that shape learners’ cognitive and reflective processes.

Summary of Thematic Findings

Across educational levels (primary, secondary, and university), chatbot types (text-based, voice-based, avatar-supported, and LLM-based), and language skills, the evidence consistently shows that chatbots serve as effective interactional partners that:

- enhance speaking fluency and communicative confidence
- improve writing quality and feedback literacy
- support vocabulary and grammar acquisition
- reduce reading anxiety and improve comprehension
- increase learner motivation and engagement
- foster metacognitive awareness

These patterns provide a comprehensive overview of how chatbots are currently integrated into L2 learning environments.

Discussion

This review set out to understand how AI-powered chatbots are functioning as

interactional partners in second language learning. When the patterns identified in the Results are interpreted through established theories of second language acquisition, a clearer picture emerges of how chatbots are extending opportunities for interaction, reducing affective barriers, and providing forms of scaffolding that were previously limited to human instruction.

Interaction Beyond Classroom Constraints

The consistent use of chatbots for speaking practice across contexts reflects principles described in Long's (1996) Interaction Hypothesis. Chatbots create conditions in which learners engage in extended dialogue, receive immediate feedback, and negotiate meaning through ongoing exchanges. Unlike classroom interaction, which is often constrained by time and social pressure, chatbot interaction allows learners to experiment with language more freely and repeatedly. This suggests that chatbots are operationalizing interactionist principles in ways that overcome practical classroom limitations.

Reducing the Affective Filter

Findings related to reduced speaking anxiety and increased willingness to communicate can be interpreted through Krashen's (1982) Affective Filter Hypothesis. Learners frequently reported feeling more comfortable interacting with chatbots than with peers or teachers. This low-pressure environment appears to encourage participation and risk-taking in language use, which are essential for communicative development. In several studies, affective improvements were observed even when measurable speaking scores changed only modestly, indicating that chatbots may first influence learners' psychological readiness to communicate.

Scaffolding Within the Zone of Proximal Development

In writing, vocabulary, and grammar tasks, chatbots functioned in ways consistent with Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD). By providing immediate prompts, explanations, and corrective feedback, chatbots offered scaffolding that supported learners beyond their independent performance level. The fact that lower-proficiency learners often benefited the most suggests that chatbots can help address differences in ability within diverse classrooms.

Supporting Both Fluency and Accuracy

The reviewed studies indicate that chatbots are being used not only for communicative practice but also for form-focused learning. Improvements in vocabulary retention and grammatical accuracy show that chatbots can bridge the traditional divide between fluency-oriented and accuracy-oriented approaches to language teaching. This dual role expands the pedagogical possibilities for integrating chatbots into language instruction.

Affective and Motivational Dimensions

Beyond skill development, many studies highlighted changes in learners' motivation and engagement. Chatbots were often described as supportive and non-judgmental partners. This emotional dimension appears to be a significant factor in encouraging learners to practice more frequently and with greater confidence.

Emerging Role of Metacognitive Feedback

The study emphasizing metalinguistic guidance illustrates how chatbot design can influence learners' reflective processes. Chatbots that encourage learners to think about language use, rather than simply produce it, may contribute to deeper and more sustainable learning outcomes.

From Technological Tools to Interactional Partners

Taken together, these interpretations suggest that chatbots are moving beyond their role as supplementary digital tools. They are increasingly functioning as interactional partners that simulate aspects of human dialogue, feedback, and instructional support. This shift has important implications for how chatbots are conceptualized in language education research and practice.

Research Gaps

Several important gaps in the literature become apparent. Most studies examined short-term interventions, making it difficult to determine whether reported improvements are sustained over time. Listening skills and multimodal interaction remain underexplored despite the increasing availability of voice- and avatar-based chatbot technologies. In addition, many studies relied on small samples, pilot designs, or quasi-experimental approaches, which limits the generalizability of findings. Research has also been concentrated primarily in university contexts, leaving unanswered questions about how chatbots can be effectively integrated into primary and secondary education.

Furthermore, although improvements in motivation and reductions in anxiety were frequently reported, few studies examined how these affective changes translate into long-term language achievement. There is also limited consensus regarding optimal pedagogical designs for chatbot-supported learning activities.

Implications for Teaching Practice

The findings suggest that chatbots can be strategically integrated into language instruction in several ways. They appear particularly useful in speaking activities where anxiety limits participation, in writing tasks that benefit from real-time feedback and scaffolding, and in vocabulary and grammar practice supported by structured interaction. Importantly, the emotional comfort learners experience when interacting with chatbots should be considered alongside cognitive outcomes. These findings also indicate a need for professional guidance to help teachers design pedagogically meaningful chatbot-supported activities that promote both interaction and reflection.

Limitations of the Review

This review has several limitations. The search was limited to the Scopus database and to studies published in English, which may have excluded relevant research indexed elsewhere or published in other languages. The focus on studies published from 2020 onward ensured relevance to recent developments in large language model–based chatbots but excluded earlier work on conversational agents in language learning. In addition, the rapid evolution of generative AI technologies means that new tools and pedagogical applications continue to emerge, and the findings presented here represent a snapshot of a rapidly developing field.

These limitations indicate the need for ongoing reviews as research in this area continues to expand.

Conclusion

This scoping review synthesized evidence from 16 empirical studies to examine how AI-powered chatbots are functioning as interactional partners in second language learning. The findings show that chatbots are being used to support speaking, writing, vocabulary and grammar development, reading performance, and learners' affective engagement with language practice.

A key insight from this review is that chatbots create low-pressure, interactive environments in which learners feel more comfortable experimenting with language. Their value lies not only in providing practice opportunities but also in reducing anxiety, encouraging participation, and offering immediate, personalized feedback.

At the same time, the effectiveness of chatbots depends largely on how they are pedagogically integrated. Purposeful task design, appropriate feedback, and teacher guidance remain essential for maximizing their educational potential.

As generative AI technologies continue to evolve, chatbots are likely to play an increasingly significant role in language education. Future research should examine long-term learning outcomes, multimodal chatbot interaction, and effective models for classroom integration.

Ethical Statement

This study is a scoping review of previously published literature and does not involve

human participants or primary data collection. All data were obtained from publicly accessible sources and analyzed in accordance with PRISMA-ScR guidelines.

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