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Language Education Potential of Generative AI Chatbots

This study systematically delineates the linguodidactic properties of generative AI chatbots as transformative instruments in foreign language pedagogy, synthesizing theoretical frameworks, literature reviews, and empirical precedents to propose their integration in foreign language teaching. The aim of the article is to identify the language education potential of chatbots as educational tools, provide scientific justification and propose a methodology to integrate them into foreign language teaching. Employing qualitative content analysis of over 20 peer-reviewed sources alongside prompt-engineering experiments with models like ChatGPT, the research identifies seven core properties: (1) role-playing simulation via reinforcement learning; (2) interactivity across six feedback modalities (educational-social, evaluative, etc.); (3) nonlinear processing enabling adaptivity to learner proficiency; (4) instant error remediation; (5) multimodal delivery unbound by spatio-temporal constraints; (6) device-agnostic accessibility; and (7) low-anxiety environments fostering motivation and autonomy. These affordances address persistent challenges in communicative competence, such as limited practice and fossilization, and outperforming traditional tools in dialogic immersion and personalization. A novel three-phase methodology is advanced: input/role assignment, contextual practice (debates/role-plays), and teacher-controlled refinement. Despite limitations like misinformation risks, chatbots position as co-agents in the “learner – AI – teacher” triad, promising scalable ELT efficacy.

Keywords: ICT, AI chatbots, linguodidactic properties, foreign language teaching, communicative competence, feedback, ELT pedagogy

Introduction

Contemporary scholarship and educational practice increasingly emphasize the transformative potential of artificial intelligence (AI) technologies in foreign language pedagogy. This surge in research attention stems from AI’s language education potential, which facilitates innovative approaches to cultivating foreign language communicative competence through integrated practice across all speech modalities (listening, speaking, reading, writing) and linguistic domains (phonetics, lexis, grammar), with AI chatbots emerging as particularly versatile tools.

AI has transitioned from a peripheral aid to a co-equal agent within the pedagogical triad “learner–AI–teacher,” a framework coined by P.V. Sysoyev (2023) [1] to capture the reconfiguration of instructional roles amid generative AI’s proliferation. This evolution enables AI to undertake diverse functions, ranging from personalized instructional trajectory modeling and content generation to emulating human-like discursual cognition, delivering real-time feedback, and evaluating learner performance — capabilities validated by recent studies confirming positive effects on lexical skills [2], grammar proficiency [3, 4], and speech abilities [5]. While overall chatbot effectiveness remains debated due to limited empirical studies, insufficient data does not render them useless; contemporary research addresses not only their linguodidactic potential but also limitations, including technological imperfections, communication failures, and adaptation challenges across diverse proficiency levels [6]

The imperative to integrate AI technologies into foreign language pedagogy stems from persistent challenges in mastering complex linguistic structures, cultivating authentic communicative competence, and elevating instructional efficacy amid limited practice opportunities. Specifically, chatbots facilitate extracurricular speech practice that demonstrably enhances not only lexical minimum acquisition but also the automation of natural communication strategies and target structures.

The aim of this article is to identify the language education potential of chatbots as educational tools, provide scientific justification and propose a methodology to integrate them into foreign language teaching.

Literature Review

The term *information and communication technologies* (ICT) emerged in the mid-1990s amid growing computer use in education, driven by their accessibility and the expansion of the Internet during societal informatization. Early ICT applications in foreign language teaching focused on automated task checking, access to video/audio materials, and primarily the traditional “drill & practice” method [7].

Digital services and platforms shifted emphasis to autonomous student work, offering 24/7 access from any device at convenient times. Social networks spurred a “social-communicative” approach [7]. Concurrently, lifelong learning gained traction, aligning with demands for tech-savvy specialists, including digital tools. Foreign language teaching thus embraced ICT like smartphone apps, MOOCs, automated testing systems, and more.

The current digitization phase, dated from 2015 by Titova S.V. and Staroverova M.V. (2023), involves gradual AI integration. Per Habr IT community data, nearly all software incorporates AI since 2020. Internet-downloadable programs for smartphones/tablets became integral to instruction. Online translators, mobile apps, and AI-driven tests now permeate language pedagogy.

AI integration has spawned foundational studies, forming one of the innovative directions in foreign language teaching. AI develops interactive materials attuned to neuro-psychological information processing (e.g., visualization, VR games/simulations) and enables individualized approaches. Machine learning and natural language processing unlocked language education potential of AI. Machine learning algorithms build large language models trained on vast texts to generate human-like speech, powering chatbots and NLP apps.

Terminological variety marks AI interactive solutions: dialog agents, virtual interlocutors, or chatbots. Differences are minor; preferences vary by researcher/era. Dialog agents stress meaningful conversation; virtual interlocutors emphasize human-like interaction; chatbots denote text-based automated systems. Chatbots simplify user interaction via voice/text assistants with instant feedback, spanning education, e-commerce, healthcare, finance, etc. University bots aid applicants with program selection and study info [9].

In 2006, Fryer L. and Carpenter R. analyzed educational potential of ALICE chatbot, identifying six didactic advantages from student interaction experiments: (1) psychological comfort (85 % preferred bot communication per survey); (2) unlimited repetition (bots are tireless unlike humans); (3) enhanced listening/reading via text-to-speech/speech-to-text; (4) sustained interest via novelty and positive experience; (5) vocabulary expansion through new lexical/grammatical practice; (6) error correction feedback [10].

Despite early promise, adoption lagged. First, early bots lacked full interlocutor capabilities — script-bound, non-diverse responses failed real-practice simulation. Milestones like Apple's Siri (2011), IBM Watson (Jeopardy win), and Google Duplex (2018 real-time calls) were assistants, not chatbots, for other tasks [11]. Besides, students often preferred teachers for better explanations [12] or peers [6] to chat-bots. This was probably due to the fact that early chat-bots were scripted, agreeable replies stifled debate, demotivating practice [6, 13, 14]. Novelty faded; mismatches in proficiency/task complexity, speech recognition failures, and context-irrelevant replies frustrated users [6, p. 23]. Another serious problem was lack of methodologies caused by weak theory/experiments that hindered integration, spurring current development.

Interest surged with deep learning and generative AI. OpenAI ChatGPT showcased understanding diverse languages and generating human-like responses.

Key studies for this research and their contributions are detailed in the Table.

T a b l e

Current State of Research on Chatbots in Foreign Language Teaching Methodology

Scientific study	Aim	Key results
Sysoyev P.V., Filatov E.M., Sorokin D.O. (2023) [15]	Review of studies on chatbots in foreign language teaching	1) Identified key issues in chatbot-based language learning, particularly communicative skills development. 2) Outlined prospects for methodology development in chatbot-supported foreign language interaction.
Kharlamenko I.V. (2023) [16]	Analysis of @LingvoBot, @multitran_bot, @slovaribot, @WordContextBot for translation and lexical semanticization	1) Revealed strengths and weaknesses of examined chatbots. 2) Provided recommendations for resource selection based on lexical work parameters. 3) Presented examples of script-based vs. neural network chatbots.

Continuation of Table

Scientific study	Aim	Key results
Divekar R.R. et al. (2021) [17]	Study of chatbot features for speech practice	1) Demonstrated differences between general chatbots and language learning chatbots. 2) Emphasized need to shift from Q&A format to natural dialogue-capable chatbots.
Dukalskaya I.V., Alikberova E.O. (2023) [18]	Analysis of existing Telegram bots for foreign language study	1) Provided examples and detailed functionality descriptions of Telegram bots. 2) Highlighted advantages: interactivity, instant feedback, motivation boost, learning efficiency.
Lavrinenko I.Yu. (2023) [19]	Analysis of ChatGPT neural network chatbot capabilities	1) Noted key achievements and advantages: dialog capability, self-learning, multilingual translation. 2) Identified prospects for large language model applications.
Chen M.R.A., Lin Y.H. (2023) [20]	Development of AI chatbot grammar learning approach for interactive English practice	1) Experimental verification of grammar learning via chatbot. 2) Positive effects: reduced anxiety, improved material retention.
Kim N. (2019) [4]	Impact of chatbots on English grammar skill improvement	1) Confirmed grammar gains in experimental vs. control groups. 2) Proposed directions for future chatbot research.
Fryer L.K., Nakao K., Thompson A. (2019) [6]	Comparison of chatbots vs. humans as language learning interlocutors	1) Identified strengths/weaknesses of each interlocutor type. 2) Called for further chatbot research and classroom implementation.
Cherkasova E.A. (2023) [3]	Methodology for differentiated grammar teaching in technical university via generative AI chatbot interaction	1) Defined didactic properties and methodological functions for English grammar teaching. 2) Specified generative AI chatbot functions for grammar instruction.

Building on predecessors' work, we propose using chatbots for supplementary speech practice to develop students' lexical and grammatical skills.

Methods and Materials

To examine chatbots as a pedagogical tool, it is essential to formulate their key properties. This study employs a qualitative analytical approach grounded in theoretical synthesis and empirical examples. Materials include peer-reviewed literature on AI in language education, technical documentation on generative AI models (e.g., large language models like GPT variants), and practical demonstrations via chatbot interactions (e.g., ChatGPT, Grok).

Methods involve: (1) content analysis of 20+ sources to extract properties; (2) prompt engineering experiments simulating language teaching scenarios; (3) evaluation of feedback types and adaptability through iterative dialogues. Data was analyzed thematically to derive seven core properties, validated against established frameworks in AI pedagogy.

Results and Discussion

This analysis delineates seven core linguodidactic properties of AI chatbots as pedagogical instruments: (1) role-playing simulation; (2) interactivity; (3) nonlinear information processing and adaptive capabilities; (4) instant feedback provision; (5) flexible instructional delivery; (6) accessibility and versatility; and (7) fostering a low-anxiety learning environment.

1. Role-playing simulation

Role-playing simulation constitutes a foundational attribute, facilitating AI self-learning through iterative user interactions. Unlike rule-based algorithmic systems, contemporary chatbots emulate neural processes, transcending rigid command execution to evolve via accumulated experiential data. This mechanism aligns with reinforcement learning, wherein user prompts serve as fine-tuning agents [21, p. 676]. Feedback efficacy hinges on training corpus quality and volume; practically, role assignment — such as prompting the bot as a “foreign language instructor” — yields authentically pedagogical responses. A critical caveat per-

sists: due to the lack of autonomous critical reasoning, chatbots may propagate inaccuracies from flawed inputs, posing dissemination risks.

2. Interactivity

Interactivity manifests in dynamic, multifaceted responsiveness to user inputs, encompassing six generative AI feedback modalities [5]: educational-social (structuring student-bot discourse for skill-building); information-reference (delivering sociocultural content for intercultural competence); methodological (supporting teacher material design and lesson planning); analytical (data processing for efficacy forecasting); evaluative (rapid assignment verification); and conditionally-creative (boundless instructional content generation). This architecture underpins methodologies spanning speech modalities, linguistic dimensions, and communicative competence facets. Essential for skill ontogenesis, interactivity engenders “lively illusions” of authentic exchange [21, p. 679], privileging productive competencies and real-world lexical confidence.

3. Nonlinear processing and adaptivity

Nonlinearity and adaptivity derive from interactivity, enabling contextually variant responses over templated outputs: “not a single templated response... but varying form and content based on query details and context” [21, p. 679]. Chatbots comprise neural architectures of interconnected neurons that dynamically weight-transform inputs during training, exhibiting task-dependent linearity (basic operations yielding fixed C from A+B) or nonlinearity (complex, context-bound transformations). Large language model instantiations parse queries holistically, generating personalized outputs attuned to proficiency and thematic nuance, positioning bots as equitable interlocutors.

The confluence of role simulation and nonlinearity begets adaptivity via dialogic reinforcement. Content-level adaptation adjusts topics, lexis/grammar, and modalities to learner profiles; didactically, it modulates pacing and task rigor through progress analytics.

4. Instant feedback provision

On-demand instantaneous feedback expedites error remediation, novel assimilation, and query resolution, mitigating fossilization endemic to second language acquisition. While irreplaceable by human instructors, chatbots multitask as dialog partner, advisor, and tutor.

5. Flexible instructional delivery

Multimodal generation (textual, graphical, auditory, visual) liberates practice from spatiotemporal bounds, amplifying foreign language exposure. Systematic target-language engagement—pivotal for communicative competence—gains potency in naturalistic contexts; for phrasal verb ontogenesis, iterative communicative drills transcend rote memorization toward fluent deployment.

6. Accessibility and versatility

Effortless device integration and task-agnostic applicability (pedagogy, inquiry, discourse) democratize access, sans technical prerequisites. This autonomy empowers learner agency over session parameters.

7. Low-anxiety learning environment

Motivational sustenance through nonjudgmental interaction curtails affective barriers; anxiety impairs metacognition, retention, and focus. Benevolent milieus recast learning as ludic pursuit. Empirical accounts affirm chatbot valorization for oracy drills, notably idea generation in stress-attenuated debate preparation [22]. Using chatbots as interlocutors maintains learning interest and enables regular speech practice for lexical and grammatical skills. Interacting with chatbots makes students active participants who experience positive emotions akin to real communication. Thus, chatbots model a near-natural learning environment.

The identified properties of AI chatbots underscore their transformative potential in foreign language pedagogy. Role-playing simulation and interactive formats address key challenges in communicative competence development, such as limited practice opportunities outside class — aligning with your expertise in AI-assisted ESP and translation post-editing. Adaptive capabilities via nonlinear processing enable personalized trajectories, crucial for mastering complex elements like phrasal verbs, where traditional methods often fall short due to fossilization risks.

However, limitations persist: chatbots lack true critical thinking that might result in misinformation propagation, necessitating teacher oversight and curated training data. Compared to tools like Quizlet or Lexilize, chatbots offer superior dialogic immersion but require hybrid integration with instructor-led refinement to mitigate biases.

AI chatbots can be integrated into foreign language teaching at university to maximize speaking practice opportunities. We propose a three-phase ELT module:

Phase 1: Input/Role Assignment — Prompt chatbot as “native-speaker mentor”; expose students to 20 target vocabulary items via contextual dialogues.

Phase 2: Interactive Practice — Nonlinear tasks (e.g., debates, role-plays) with instant evaluative feedback; adapt difficulty based on error patterns.

Phase 3: Assessment/Refinement — Analytical feedback for self-correction; teacher reviews for accuracy.

This leverages properties 1–5, fostering automation and confidence for real-world use.

Conclusion

The properties of AI chatbots position them as indispensable tools for enhancing lexical and grammatical skills, especially in autonomous foreign language learning. By simulating authentic communication, providing adaptive feedback, and creating low-stress environments, they elevate ESP training efficacy. Future research should explore multimodal integrations (e.g., voice-enabled bots) and longitudinal impacts on communicative automation. Implementing the proposed methodology promises scalable, personalized language mastery, bridging AI potential with pedagogical needs.

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