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CHATBOTS AS A SUPPLEMENTARY LANGUAGE LEARNING TOOL: ADVANTAGES, CONCERNS, AND IMPLEMENTATION

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ABSTRACT

This paper reviews research on the use of chatbots for language learning and provides suggestions for how teachers can effectively leverage chatbots to support students' language development. Several studies analyzing different categories and capabilities of chatbots for language learning are summarized, highlighting benefits such as providing conversational practice, adaptive responses, writing support, vocabulary development, and personalized recommendations. Limitations are also noted regarding comprehension weaknesses, content gaps, and technology constraints. Additionally, the paper explores teacher perceptions, finding openness towards adopting chatbots but also knowledge gaps and priorities for enhancements to maximize chatbots' usefulness. Key recommendations center on carefully selecting chatbots aligned with learning objectives, mitigating limitations through thoughtful integration, enhancing contextual abilities and speech recognition, and curriculum changes to promote teacher readiness. Finally, suggestions are provided to address risks like overreliance as well as specific methods for effectively incorporating chatbots into lessons to build skills through conversational practice, writing development, receiving feedback, and vocabulary expansion via interactive activities.

KEYWORDS: AI, Chatbots, language learning, EFL

1. INTRODUCTION

Chatbots such as ChatGPT have become increasingly popular among both students and teachers for language learning. Chatbots are software programs powered by artificial intelligence on websites and in applications that answer questions posed by users. Using machine learning and natural language processing, chatbots analyze the input from users to detect the intent and then formulate a response accordingly. Trained on huge datasets, they look for patterns and comprehend natural speech to address users' inquiries. Chatbots are also able to recall previous interactions to increase their knowledge base over time and become more precise with answers.

In the arena of language learning, chatbots are being used in many ways. For example, they can be used by second language learners for conversation practice to improve listening and speaking skills.

The chatbot can be programmed with dialog targeted at the learner's level and provide a safe space for practicing real-world conversation. In addition to being used for conversation practice, chatbots can also be used for writing support. Some chatbots are designed to help with writing skills by letting users ask grammar questions and get feedback on their written work. The ability to receive instant feedback is greatly beneficial for improving learners' writing skills.

Moreover, chatbots can be used for vocabulary and grammar development. Through flashcards, quizzes, and other interactive activities, chatbots help learners expand their knowledge of grammar rules and vocabulary, and the affordance of adaptive responses lets users progress at their own pace. Chatbots are also useful for personalized learning, in that they can provide tailored recommendations and content based on areas in which the learner struggles, with learners' weaknesses identified through its conversations with the chatbot. This level of personalization improves engagement and outcomes. Additionally, chatbots provide quick access to support. They can address student questions in real-time, providing guidance when human teachers are unavailable. This facilitates self-directed learning while still giving access to support.

In these ways, the interactivity, adaptive capabilities, and expansive resources of chatbots are enhancing and extending language learning for students. As the technology advances, chatbots show promise in making language education more accessible, customized, and engaging. However, many educators are wary about the use of chatbots by students, who may become too reliant on chatbots, for example, for completing homework. Thus, after a review of research done on the use of chatbots for language learning, suggestions will be given for how teachers can productively have students use chatbots in ways that support their learning rather than replacing students' effort and critical thinking.

2. Research on Chatbots for Language Learning

Much research has been conducted on the use of chatbots for language learning. For example, Fryer and Carpenter (2006) looked at the capabilities of chatbots for providing feedback to language learners. In their study, 211 students used two chatbots in a language learning class and then were surveyed. Based on the findings of their study, they concluded that while current chatbots can be useful, there are no chatbots designed specifically to fulfill the needs of students learning a foreign language, but they also correctly predicted that chatbot platforms for language learners would likely materialize and take various forms, as has been seen since. Fryer and Carpenter noted that it seems essential for chatbots to appear as human-like as possible with solid backstories, interests, and personalities to enable maximally beneficial student conversations and connections. For more advanced students, casual conversation chatbots for independent practice could prove valuable, but for lower proficiency or less motivated learners, chatbots tailored to specific linguistic tasks could make for more constructive learning tools, according to Fryer and Carpenter.

Much more recently, since the use and capabilities of chatbots has been greatly expanded, Haristiani (2019) undertook a study with the goal of examining different categories of chatbots and considering their potential for language learning. In her study, three types of chatbots were analyzed in terms of advantages and disadvantages. The paper analyzed different types of chatbots and their potential for use as language learning tools. Three main categories of chatbots were identified:

- 1) Structure-based: Flow chatbots follow predefined paths, AI chatbots can update responses based on conversations, and hybrid chatbots combine aspects of both.
- 2) Purpose-based: Functionality chatbots serve specific functions like learning or shopping. Fun chatbots are for entertainment.
- 3) Audience-based: Generalist chatbots have broad knowledge, while specialist chatbots focus on a narrow domain.

Some benefits of using chatbots for language learning that were highlighted, including that students feel more at ease conversing with a bot versus a person; chatbots' can tirelessly repeat material without getting bored; having text and voice interactions helps learners practice reading and listening; the novelty factor of bots intrigues learners; they provide opportunities to use diverse linguistic structures rarely encountered otherwise; and there is the potential for quick feedback on spelling and grammar. Overall, while limitations exist, Haristiani (2019) concluded that chatbots may offer unique benefits as a supplementary language learning aid through their interactive format and capacity to engage students in comfortable, focused practice. Additionally, AI chatbots are most promising for language learning since they can improve responses over time.

Kim et al. (2019) performed an analysis of research on chatbots. Their study examined how chatbots with different types of artificial intelligence can be used in various ways for language learning. The strengths and weaknesses of several AI chatbot types were evaluated, building on previous literature analyzing chatbots in English language contexts as well other areas. Kim et al. suggest two main implications for language instructors. First, teachers should carefully select chatbots that align with their pedagogical goals and students' needs and learning styles. Rather than just integrating technology without purpose, it is crucial for instructors to understand which chatbots work best for developing certain skills. For example, some bots allow voice practice on diverse topics, while others enable grammar error correction. Second, instructors should be mindful of chatbots' limitations including poor comprehension of user input, lack of content breadth, and short interaction duration that can constrain learning. While promising, they note that chatbots may fail to understand student language, remember conversation topics, or have enough knowledge to respond adequately. Thus, teachers need to mindfully mitigate such weaknesses that can undermine chatbots' advantages. Overall, they concluded that studies on chatbots show positive effects for language learning by providing enriched input and practice opportunities, but more work remains to optimize AI chatbots for language learners' development.

More recently, Belda-Medina and Calvo-Ferrer (2022) did a study on 176 undergraduate education majors to determine how future teachers view AI chatbots in terms of relevance and appropriateness for language education. Their research explored future language teachers' knowledge, satisfaction, and perceptions regarding the integration of chatbots for language learning. Three main conclusions were drawn:

1) Teacher candidates have limited knowledge of modern chatbots, mostly just viewing them as basic intelligent personal assistants. There is a gap between the preparedness of future teachers and the advances in AI for language learning.

2) Successful chatbot integration depends on both linguistic and technological factors. Lexical richness, semantic coherence, adaptivity, and personalization are important. Quantitative data showed no gender/setting differences in satisfaction with chatbots' linguistic abilities, but qualitative data revealed some gender-based variances in attitudes towards customization, topics, and inclusive language.

3) Teacher candidates had positive perceptions of the usefulness of chatbots, their ease of use, and integration potential, but moderate actual interest in adopting them soon. The teacher candidates were found to prioritize human interaction, though they showed willingness to learn more about the technology. Multimedia, gamification, nonverbal communication, and social media integration could promote satisfaction. Key areas for improvement are pragmatics and speech recognition technologies.

Belda-Medina and Calvo-Ferrer (2022) concluded that future teachers are open to chatbots for language learning, but knowledge gaps, design considerations, and technological limitations need addressing for successful adoption of chatbots. Recommendations include curriculum improvements, leveraging multimedia, and enhancing contextual language abilities and speech recognition.

Mageira et al. (2022) performed a study in which they used an AI chatbot called the AsasaraBot to teach culture in a foreign language to 61 high school students. Based on the evaluation data of the presented chatbot approach, several key issues emerged regarding ICT-driven learning and CLIL models. Firstly, conversational AI chatbots can enrich traditional teaching in important ways, as students can learn independently at their own pace in a friendly, no-pressure environment outside the classroom. Users found discussions with the AsasaraBot chatbot quite interesting and comprehensible in the assessed program, and they wanted access to similar training again soon. Additionally, for teachers, chatbots can assist in remote courses, which have increased due to COVID-19. A core goal is for chatbot technologies to supplement rather than replace human teachers. The data suggests it is premature to conclude that chatbots can fully substitute traditional instruction, given technology limitations in natural language processing, unnatural dialogue flow, and teacher/student unfamiliarity with the tools. Nonetheless, chatbot-enabled unified learning of foreign languages and cultural content seems largely positive, though the small sample and brief engagement in the study may have skewed

results. Students still answered a high percentage of questions correctly and found the chatbot educationally beneficial across languages, underscoring the cross-cultural adaptability of this approach. Ultimately though, Mageira et al. (2022) concluded that chatbots exhibit meaningful advantages as a complementary instrument for current teaching methods rather than a complete replacement.

Jeon (2021) performed a study with the goal of creating an inventory of the capabilities that chatbots offer in elementary English as a foreign language (EFL) classrooms and investigated how those capabilities influence learners' psychological factors related to their motivation to learn English through chatbots. Thirty-six Korean elementary students took a 16-week EFL course using customized Google Dialogflow chatbots. After the course, in-depth individual interviews were performed regarding the learners' experiences with and attitudes toward the chatbots. Student-chatbot interaction log data from during the course was also gathered and analyzed. Examining student interview responses and student-chatbot interaction records confirmed the existence of various types of pedagogical, technological, and social possibilities generated through chatbot use. However, while all students experienced the same chatbot capabilities, each student perceived the affordances differently. The study also identified how the chatbot affordances impacted various psychological aspects in the language learners, especially regarding motivation to study English using chatbots. By considering the assorted chatbot possibilities and their differential influences on students, instructors can more effectively capitalize on the benefits of technological progress to facilitate language acquisition. Additionally, Jeon's (2021) research provides key implications for future chatbot-enabled language education. First, the customized chatbots built with Dialogflow illustrate how teachers could integrate conversational agents into lessons through accessible chatbot development platforms, and relevant teacher training may need to incorporate both technical and pedagogical facets of chatbot utilization. Next, once created, teachers' chatbots have considerable scalability to benefit large student numbers simultaneously. Finally, enabling student interaction with teacher-created chatbots across devices, like smartphones, can support ubiquitous access to chatbot-assisted language learning, potentially unveiling additional benefits.

Kim et al. (2021) conducted a study to explore the effect of AI chatbots on 49 Korean university students' speaking skills in English. The study investigated the use of AI chatbots for class activities and their effects on improving English speaking skills across proficiency levels. Results were positive; both lower and intermediate level students improved in the read aloud task, significantly improving their pronunciation, intonation, and stress. In the respond to questions task, both groups scored higher after AI practice, regardless of level. For fluency measured in words per second in the read aloud task, no significant gain occurred for the lower level group, while intermediate students did improve significantly. Thus, lower level students did not noticeably increase in fluency from the AI chatbot practice. Student perceptions of AI chatbots were largely positive regarding improving speaking and pronunciation in a comfortable environment, but some issues such as communication problems were noted, and suggestions included expanding chatbot topic options. Prior research has likewise shown

that voice chat bots assist learning and specifically help improve pronunciation for lower levels. This study confirms those findings for both intermediate and lower level students on pronunciation, intonation, stress and communication abilities.

Huang et al. (2022) analyzed 25 empirical studies using chatbots for language learning looking at the educational benefits, technological issues, and possible challenges. They had five main findings. First, it is mainly higher education settings that take advantage of increased online and computer-assisted learning, including chatbots, and open conversation chatbots keep discussion flowing, while task-focused chatbots assist with specific procedures. Secondly, they evaluated chatbots in terms of timeliness, personalization, and ease of use and found that students can use chatbots to practice any time without human partner limitations. Benefits of chatbots include the provision of immediate, tireless responses, the capability of personalizing materials based on student interactions, and possible integration of chatbots into webpages/apps, which facilitates accessible student-chatbot conversations.

In terms of pedagogical uses of chatbots, Huang et al. (2022) identified five areas: interlocution, simulation, transmission, helpline, and recommendation, with interlocution for communication practice being the most common. Additionally, they addressed how chatbots can foster social presence with chatbots via supporting self-disclosure, continuing friendly discussion, expressing agreement, and using names. Self-disclosure encourages student disclosure and longer responses, and positive effects were found on perceived intimacy and enjoyment. Accordingly, empathic chatbots mitigate social exclusion. While technological limitations for chatbots still exist, these are not the only remaining issues. Huang et al. (2022) also noted cognitive load, narrow database support, and robotic voices that chatbots may use. Cognizant of such limitations, teachers should determine the best uses the best uses for chatbots and adhering to multimedia learning principles to help with cognitive processing.

3. Concerns and Suggestions for Integrating AI Chatbots into Language Learning

In addition to the benefits presented above in the research review, language teachers have some valid complaints and concerns regarding students relying too heavily on AI chatbots:

1. Lack of original thought - Teachers worry that students will become too reliant on the chatbot to generate ideas, questions, and conversation topics rather than thinking creatively and originally.
2. Loss of human interaction - There is a concern that increased interaction with chatbots could lead to decreased live human interaction. Accordingly, students may miss important social cues.
3. Plagiarism risks - Teachers need to guard against students using text generated by chatbots as their own original work without proper attribution.
4. Cheating concerns - Some teachers are uneasy about chatbots potentially helping students cheat rather than earnestly completing their school work. Thus, integrity checks become crucial.
5. Poor grammar reinforcement - If chatbots have inherent flaws in grammar, poor language skills may be reinforced through their interactions, and mistakes could go unnoticed.

6. Filter bubble effect - Relying primarily on chatbots could limit vocabulary exposure or diverse perspectives that come from communication with actual humans.

Valid guardrails should be established so students can benefit from AI help while avoiding overreliance or other risks. Clear policies, class discussion and teacher involvement in oversight are warranted to maximize the advantages without drawbacks. Addressing teacher concerns thoughtfully provides a balanced approach. Additionally, effective methods for using AI chatbots for language learning are needed. Below are suggestions for how teachers can have students effectively use AI chatbots to enhance language learning:

1. Practice conversations - Teachers can have students engage in basic conversations with a chatbot, responding to questions and chatting about simple topics. This helps improve listening comprehension and speaking practice.
2. Expand vocabulary - Chatbots provide a great way for students to explore using new vocabulary words and phrases in contextual conversations. Teachers can assign students to try using new vocabulary words with the chatbot.
3. Fix grammar mistakes - When chatbots do not understand a statement due to grammar errors, students are pushed to self-correct. Teachers can show learners how to use this for improvement.
4. Writing practice - Students can write short journal entries and stories that they submit to a chatbot for feedback, prompting revisions, thus building writing skills.
5. Speaking accuracy - Reading passages out loud for a speech recognition chatbot provides instant clarity on pronunciation or fluency issues that should be addressed.

The interactive nature of AI chatbots provides ways for students to get conversational language practice, instant feedback, and ultimately take more ownership over improving their language learning gaps. Leveraging chatbots is an engaging method for improvement.

4. CONCLUSION

The utilization of chatbots is growing in language education and offers unique interactive capabilities for supporting learners' development. When thoughtfully integrated, chatbots provide tailored, engaging practice to build skills in reading, writing, listening and speaking. Students and teachers alike can benefit greatly, as long as we look to optimize chatbots' strengths while mitigating the current weaknesses through human oversight and involvement. Chatbots are a promising tool to enrich traditional classroom instruction and independent learning, though research is still emerging regarding effective implementation. Findings confirm that chatbots stimulate interest and enable self-paced development through tireless, adaptive content personalization. Despite understandable hesitations, teacher candidate surveys signal overall acceptance and openness to this model. Knowledge and technology gaps call for additional studies and system refinements, but linking responsible integration with innovative chatbot use may help us move forward in enhancing accessibility, equity, engagement

and outcomes in the arena of language education. Progress requires being open and proactive - judiciously embracing contemporary solutions while addressing challenges thoughtfully and directly. Chatbots appear well positioned to play a role in advancing our aims if we exercise care and wisdom.

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