

Enhancing Academic Speaking Skills Through AI Chatbots: A Study on English Language Learning in Higher Education

Sunoko Setyawan^{1*}, Rizqi Febrian Pramudita²

¹English Education Department, Faculty of Education, Universitas Jember, Indonesia

²Department of Language, Communication, and Tourism Politeknik Negeri Jember, Indonesia

Corresponding Author: Sunoko Setyawan sunokosetyawan@unej.ac.id

ARTICLE INFO

Keywords: Artificial Intelligence, Chatbots, English Language Instruction, Higher Education, Educational Technology, Language Learning, EFL

Received : 21 February

Revised : 24 March

Accepted: 24 April

©2025 Setyawan, Pramudita: This is an open-access article distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

The development of artificial intelligence (AI) technology has opened up new opportunities in education, including in teaching English in higher education. This study aims to explore the use of AI-based chatbots as teaching partners in English learning for college students. This study uses a mixed-methods approach involving a small experiment that utilizes chatbots in the learning process, as well as interviews and questionnaires to measure student and lecturer perceptions. Initial results indicate that chatbots are able to increase learning engagement, provide instant feedback, and support ongoing language practice outside of class hours. However, this study also found challenges in terms of the limited understanding of context by chatbots and the need for training for teachers to integrate this technology effectively. These findings are expected to contribute to the development of more adaptive and interactive technology-based learning strategies in the context of English learning in higher education.

INTRODUCTION

The development of digital technology has had a significant impact on various sectors of life, including in the world of education. One form of innovation that is growing rapidly is the application of artificial intelligence (AI) in the learning process (Efendi Hidayatullah, 2024; Kooli, 2023). In this digital era, learning is no longer limited to conventional interactions between lecturers and students in the classroom, but has evolved into a more interactive, personal, and flexible experience with the help of technology (Osamor et al., 2023; Perry, 2024). In this context, AI-based chatbots are starting to be seen as an alternative or complement to traditional teaching methods (Muti'ah & Maulidia Azizah, 2024).

A chatbot is a computer program designed to simulate a conversation with a human user through text or voice. In education, chatbots can be used as learning assistants that are available anytime and anywhere (Halali et al., 2023; Rouabhia, 1930). In the field of English language teaching, chatbots have the potential to provide a richer learning experience, especially in terms of conversation practice, instant feedback, and the provision of materials tailored to individual learning needs (Bagus et al., 2022).

English language learning in higher education still faces various challenges, such as low student engagement, limited interaction time in class, and the gap between language theory and practice (Kingchang et al., 2024). Therefore, an innovative approach is needed to improve the effectiveness and efficiency of the teaching and learning process. The integration of chatbots in English teaching offers a promising solution by providing real-time, adaptive, and technology-based interactions (Guntur Arie Wibowo et al., 2023).

Several previous studies have shown that chatbots can increase learning motivation, extend the duration of language practice, and strengthen understanding through interesting interactive dialogues (Rahman et al., 2025). However, there has not been much research that specifically explores the effectiveness of chatbots in the context of English language education in universities in Indonesia (Wijirahayu et al., 2024). In addition, the implementation of this technology still faces challenges such as the ability to understand the context, the appropriateness of the content, and the readiness of lecturers and students to integrate it into learning (McGrath et al., 2024).

Through this study, the author aims to explore more deeply how AI-based chatbots can act as partners in teaching English at the college level (Gökçearsan, 2024). This study will analyze both the technical aspects of using chatbots and the affective and cognitive responses of students and teachers to the technology (Arts & Soc, 2023; Labadze et al., 2023). It is hoped that this study can provide new insights into the integration of intelligent technology in a language learning system that is more adaptive and responsive to the needs of students in the digital era (Arts & Soc, 2023).

In this study, chatbots will be used to support language skills such as speaking and writing, with an emphasis on continuous interaction outside of class hours. The author will observe how chatbots can strengthen the role of lecturers as facilitators, not just as the main source of information. Thus, this

approach is expected to increase student learning independence and optimize limited learning time in the classroom.

Finally, this research is not only academically relevant, but also strategic in facing the transformation of education that is increasingly moving towards digitalization and AI-based learning. The findings of this study are expected to be the basis for developing a more innovative and sustainable English learning model in the university environment.

METHODOLOGY

1. Research Approach and Type

This study uses mixed-method approach, which combines quantitative and qualitative methods to obtain comprehensive understanding about the effectiveness of chatbots on students' speaking skills in the *Academic Speaking course*. The quantitative method was used to measure the improvement of the students' speaking ability, while the qualitative method was used to explore the experience and perception of the student and lecturers when using chatbots in the teaching and learning process.

This study uses quasi- experimental design, which is equipped with interviews and questionnaires as supporting instruments.

2. Subject and Location of Research

This study was carried out in Universitas Jember in Indonesia and implemented in the *Academic Speaking* course. The subjects of this study consisted of English education students in their 4th semester, with a number of 34 students. Furthermore, 1-2 lecturers were involved as informant for interview.

3. Research Instruments

The instruments used in this study included:

- Oral test (pre-test and post-test) to measure the students' speaking skills, which involved fluency, pronunciation, speech organization, and academic vocabulary used.
- Closed and open questionnaires to measure students' perception regarding the effectiveness of chatbot, learning motivation, and the convenience in the *speaking* activity.
- Semi- structured interview was used to know the students and lecturers' experience in using chatbots in the *speaking* activity.
- Observation was used when the students perform academic activity such as discussion, presentation, and argumentation.
- Chatbot conversation log was used as additional data to know speech pattern, chatbot responses, and the role of chatbots in strengthening students' *speaking* skills

4. Research Methods

This study was carried out in three main stages:

1. Preparation :

- Selecting the right AI -based chatbot for speaking practice (e.g. ChatGPT, Orai, Yoodli AI or similar platforms).
- Compiling academic scenario and chatbot-based learning material, such as academic dialogues, debates, and formal discussions.
- Introducing and training the lecturers and students related in using the chatbots.
- Conducting speaking pre-test.

2. Implementation :

- For 4–6 weeks, students were instructed to train using chatbots for various *Academic Speaking* activities, such as academic discussion, presentation, and responding to open-questions with academic format.
- Students were directed to do interaction at least 3-4 times per week with chatbot in specified scenario.
- Observation and log recording were carried out regularly.

3. Evaluation :

- Conducting speaking post-test to measure the improvement of the students' academic speaking skills.
- Distributing questionnaire and conducting interview.
- Analyzing research data.

Data Analysis Techniques

- **Quantitative data** from the pre-test and post-test were analyzed using descriptive statistics and *paired sample t-test* to see the significance of the improvement of the students' speaking skills.
- **Questionnaire data** were quantitatively analyzed and categorized according to the aspects of motivation, perception effectiveness, and user's experience.
- **Interview data** and **chatbot logs** were analyzed using **thematic analysis** to identify the pattern of the responses, challenges, and perceived benefits.
- **Observation data** were used to strengthen the findings from interviews and questionnaires

Research Ethics

This study was conducted by upholding the principles of ethics:

- All research participants were notified about the objective this research, and the participants were voluntary (informed consent).
- Participant identity and data are kept confidentially.

The researcher ensures that the chatbots are used as complement, not teacher replacement, and that all activities were designed to support the improvement of students' academic speaking skills.

RESEARCH RESULT

1. The improvement of students' academic speaking skills

The results of the pre-test and post-test analysis show that there is improvement in the students' *Academic Speaking* skills after using a chatbot for 6 weeks. The test covers four aspects of assessment: fluency, pronunciation, organization of ideas, and academic vocabulary usage.

The following are the average results of the pre-test and post-test scores:

No	Aspect Evaluation	Pre-test Average	Post-test Average	Improvement
1	Fluency	65.2	76.8	+11.6
2	Pronunciation	62.5	74.3	+11.8
3	Organization of Ideas	60.1	72.7	+12.6
4	Academic Vocabulary Usage	58.9	70.5	+11.6
	Total Average	61.7	73.6	+11.9

The statistics analysis (paired-sample) t-test shows that the improvement is statistically significant ($p < 0.05$), which means the use of chatbots has positive contributions towards the development of students' academic speaking skills.

2. Student perception on the use of chatbots

The results of the questionnaire distributed to 35 students obtained the following information:

Statement	Agree (%)	Neutral (%)	Don't agree (%)
Chatbot helps me practice speaking without feeling ashamed	88.6	8.6	2.8
Chatbot helps me become more confident when speaking English	74.3	20.0	5.7
Chatbot sometimes does not fully understand the academic context I am trying to convey.	60.0	25.7	14.3
I think that practicing with chatbot improve my academic vocabulary	77.1	17.1	5.8
I want to keep using chatbots for learning English	82.9	14.3	2.8

The majority of the students show positive attitude towards the use of chatbots. They feel more comfortable practicing speaking in pressure-free atmosphere and feel more motivated to speak English outside class.

Interview Results

The results of the interview to 6 students and 1 lecturer found a number of main ideas:

- Flexibility and Availability: Students appreciate the fact that they can practice anytime, not limited by class schedules.
- Lack of context: Some students note that chatbots sometimes fail to grasp the meaning when discussions become highly specific or academically complex.
- Improved self-confidence: Students who were previously passive are now becoming more courageous in trying to speak, even in class discussions.

- The crucial role of lecturers: Lecturers emphasize that while chatbots assist with technical practice, their guidance and correction remain essential for well-rounded learning.

4. Chatbot interaction analysis

The results of the chatbot conversation logs found that:

- Students are increasingly using chatbots to practice answering argumentative questions and simulating presentations.
- The most frequent discussion topics are education, technology, and the environment
- Chatbots provide immediate feedback in the form of correct sentence structures, enriched vocabulary suggestions, and relevant advice.

DISCUSSION

The results of this study indicate that the integration of AI-based chatbots in the Academic Speaking course makes a significant contribution towards the improvement of students' speaking skills in higher education. This finding is in line with previous studies (Mathur & Mahapatra, 2022; Wijirahayu et al., 2024) which state that chatbots can be an effective tool in language learning, especially in creating consistent and stress-free interactions.

The increase in students' post-test scores across all aspects of speaking – including fluency, pronunciation, organization of ideas, and academic vocabulary usage – suggests that chatbots can serve as a practice medium that encourages active engagement. The average increase of 11.9 points reflects that students are able to internalize complex speaking skills through repeated interactions with the AI-based system. This can be explained through (Luthfi, 2023; Yusuf et al., 2024) output hypothesis theory, which emphasizes the importance of language production as a means of learning. Chatbots provide a continuous language production practice space, without time and place constraints (Tsunemoto & Trofimovich, 2024).

On the affective side, the results of the questionnaire showed that most students felt more confident in using English after practicing with the chatbot. 88.6% of students stated that the chatbot helped them practice without feeling embarrassed. This supports the idea that technology can reduce foreign language anxiety (Amrullah et al., 2021), which is often a major obstacle in speaking skills. The non-judgmental and repetitive practice environment allows students to hone their skills without fear of making mistakes.

However, these findings also show the limitations of chatbot technology, especially in understanding academic contexts in more depth. Around 60% of students admitted that chatbots sometimes did not respond relevantly when they conveyed complex topics (Wael et al., 2023). This confirms that although AI technology is quite advanced, its ability to capture pragmatic nuances and cultural contexts in academic communication is still limited. This issue was also touched on in a study by (Bettayeb et al., 2024), which stated that although chatbots can imitate conversations, their understanding of academic discourse structures is still not as good as human teachers (Noroozi et al., 2024; Noy & Zhang, 2023).

The findings from the lecturer interviews reinforce this. While acknowledging that chatbots are effective for technical practice and repetition, lecturers emphasize the importance of the teacher's role in providing analytical and contextual feedback (Mouvet & Taverniers, 2022). Chatbots tend to only respond based on general language patterns, without considering the rhetorical purpose or argumentative structure that are part of academic speaking skills. Therefore, chatbots are more appropriately positioned as learning partners, not as substitutes for teachers (Kim et al., 2022).

The results of the chatbot interaction log analysis also revealed that students most often use chatbots for discussion exercises and presentation simulations. This reflects students' efforts to build academic discourse, even though it is done through interaction with the system. Interestingly, chatbots are also able to provide suggestions for improving sentence structure and vocabulary directly, which in the long term can enrich students' linguistic competence (Chima Abimbola Eden et al., 2024).

In the context of pedagogy, the integration of AI-based chatbots is in line with the principle of learner-centered learning, where students are encouraged to actively explore and manage their own learning process. The 24/7 chatbot feature gives students the freedom to determine when and how they learn – an ideal condition in higher education, which emphasizes independence and flexibility (Holmes et al., 2022).

However, to optimize the use of chatbots in Academic Speaking courses, instructional support from lecturers is needed, as well as the development of more complex interaction scenarios that are appropriate to the academic context. In addition, the digital literacy of lecturers and students must also be improved so that this technology can be utilized optimally and not just become a trend (Harry, 2023).

Overall, this study provides empirical contributions to the development of technology-based English learning models in higher education. Chatbots are proven not only as communication aids, but also as a medium for developing students' cognitive and affective skills. However, its success is highly dependent on the accompanying pedagogical design and wise integration with conventional teaching approaches.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this study, it can be concluded that the use of AI-based chatbots in the Academic Speaking course has proven effective in improving students' speaking skills, especially in the aspects of fluency, pronunciation, organization of ideas, and academic vocabulary usage. Students also reported increased confidence in communicating in English. However, chatbots still have limitations in understanding more complex academic contexts, so the role of lecturers remains very important in providing more in-depth and contextual feedback.

As a recommendation, further development of chatbots should be focused on improving their ability to capture academic context and provide more personalized and relevant feedback. Lecturers are also advised to integrate the

use of chatbots as a complementary tool in teaching, not as a replacement, by providing more targeted guidance in the use of this technology. In addition, digital literacy training for lecturers and students must be strengthened, so that this technology can be optimally utilized in supporting English learning in higher education.

ADVANCED RESEARCH

Limitations of the Study

While this study provides valuable insights into the use of AI chatbots as a teaching aid for Academic Speaking in higher education, several limitations should be considered. Firstly, the research sample was limited to a small group of students (34) from a single university, which may not fully represent the broader population of university students. Therefore, the findings may lack generalizability to other institutions or educational settings.

Additionally, the study primarily focused on short-term interactions with the chatbot over 6 week period, which may not have been long enough to assess the long-term impact of chatbot use on speaking proficiency. Another limitation is the nature of the chatbot itself; while AI chatbots have advanced significantly, they still struggle to fully understand complex academic contexts or provide nuanced feedback that a human instructor might offer. This limitation suggests that chatbot-based learning is more beneficial as a supplementary tool rather than a complete replacement for human interaction.

Finally, the study was based on self-reported data from surveys and interviews, which are subject to participant bias. Some students may have overestimated the benefits they experienced due to the novelty of the technology or social desirability bias.

Suggestions for Future Research

Future research can address these limitations by expanding the sample size to include students from multiple universities or institutions across different disciplines, which would help assess the generalizability of chatbot effectiveness in diverse academic settings. In addition, longitudinal studies could provide deeper insights into the long-term impact of AI chatbots on students' speaking skills over extended periods of time.

Further investigations should also explore the potential for enhancing chatbot algorithms to better handle complex academic discourse, including discipline-specific vocabulary and critical thinking skills. Additionally, examining the integration of AI chatbots with other forms of educational technology (e.g., virtual classrooms, peer interaction platforms) could provide a more holistic understanding of how AI can contribute to academic learning environments.

Lastly, future research could consider including a comparative study between chatbot-based learning and traditional teaching methods to examine whether AI chatbots provide measurable advantages in terms of engagement, motivation, and actual improvement in speaking proficiency.

REFERENCES

- Amrullah, A., Thohir, L., Sahuddin, S., Nawawi, N., & Henny, H. (2021). Development of Academic Speaking Communicative Tasks Model for Students of English Education. *Proceedings of the 2nd Annual Conference on Education and Social Science (ACCESS 2020)*, 556(Access 2020), 32–35. <https://doi.org/10.2991/assehr.k.210525.040>
- Arts, G. J., & Soc, H. (2023). *Global Journal of Arts Humanity and Social Sciences ISSN : 2583-2034 The relationship between entrepreneurial orientation and business performance : A Review BY © Copyright 2023 GSAR Publishers All Rights Reserved Global Journal of Arts Humanity and Socia. 2001*, 1146–1152.
- Bagus, I., Mantra, N., Handayani, N. D., Suwandi, N., & Maba, W. (2022). Promoting Students' Academic Speaking Skills Through Project Report Presentation. *International Journal of Linguistics and Discourse Analytics*, 3(2), 94–100.
- Bettayeb, A. M., Abu Talib, M., Sobhe Altayasinah, A. Z., & Dakalbab, F. (2024). Exploring the impact of ChatGPT: conversational AI in education. *Frontiers in Education*, 9(July). <https://doi.org/10.3389/feduc.2024.1379796>
- Chima Abimbola Eden, Onyebuchi Nneamaka Chisom, & Idowu Sulaimon Adeniyi. (2024). Integrating AI in education: Opportunities, challenges, and ethical considerations. *Magna Scientia Advanced Research and Reviews*, 10(2), 006–013. <https://doi.org/10.30574/msarr.2024.10.2.0039>
- Efendi Hidayatullah. (2024). The Impact of Talkpal.AI on English Speaking Proficiency: An Academic Inquiry. *Journal of Insan Mulia Education*, 2(1), 19–25. <https://doi.org/10.59923/joinme.v2i1.98>
- Gökçearsan, Ş. (2024). *Benefits , Challenges , and Methods of Artificial Intelligence (AI) Chatbots in Education : A Systematic Literature Review To cite this article : Gokcearslan , S . , Tosun , C . , & Erdemir , Z . G . (2024) . Benefits , challenges , and methods of Benefi.*
- Guntur Arie Wibowo, Madhan Anis, Chairuddin, Van Kim Hoang Ha, & Aulia Rahman. (2023). The Use of Nasi Pelleng Local Wisdom as Social Science Teaching Material. *Jurnal Iqra' : Kajian Ilmu Pendidikan*, 8(2), 130–150. <https://doi.org/10.25217/ji.v8i2.3904>
- Halali, A. A. S., Ismail, L., Samad, A. A., Razali, A. B., & Noordin, N. (2023). Mediation Effects of Language Anxiety and Prior Learning Experience on Academic Speaking Challenges and Strategies among Libyan Students in Malaysian Universities. *World Journal of English Language*, 13(6), 385–401. <https://doi.org/10.5430/wjel.v13n6p385>
- Harry, A. (2023). *Harry, A. (2023). Role of AI in education. Injuruty: Interdisciplinary Journal and Humanity*, 2(3). e-ISSN: 2963-4113, p-ISSN: 2963-3397. 2(3), 260–268. <https://injuruty.pusatpublikasi.id/index.php/in>
- Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Shum, S. B., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2022). Ethics of AI in Education: Towards a Community-Wide Framework. *International Journal of Artificial Intelligence in Education*, 32(3), 504–526. <https://doi.org/10.1007/s40593-021-00239-1>
- Kim, J., Lee, H., & Cho, Y. H. (2022). Learning design to support student-AI

- collaboration: perspectives of leading teachers for AI in education. In *Education and Information Technologies* (Vol. 27, Issue 5). Springer US. <https://doi.org/10.1007/s10639-021-10831-6>
- Kingchang, T., Chatwattana, P., & Wannapiroon, P. (2024). Artificial Intelligence Chatbot Platform: AI Chatbot Platform for Educational Recommendations in Higher Education. *International Journal of Information and Education Technology*, 14(1), 34–41. <https://doi.org/10.18178/ijiet.2024.14.1.2021>
- Kooli, C. (2023). Chatbots en educación e investigación: un examen crítico de las implicaciones y soluciones éticas. *Sustainability (Switzerland)*, 15(7).
- Labadze, L., Grigolia, M., & Machaidze, L. (2023). Role of AI chatbots in education: systematic literature review. *International Journal of Educational Technology in Higher Education*, 20(1), 1–17. <https://doi.org/10.1186/s41239-023-00426-1>
- Luthfi, L. M. (2023). Developing EASPod as a Medium for English Academic Speaking for Mahasantri. *ELLITE: Journal of English Language ...*, 08(2), 74–85. <https://doi.org/10.32528/ellite.v8i2.20980>
- Mathur, M., & Mahapatra, S. (2022). Impact of ePortfolio Assessment as an Instructional Strategy on Students' Academic Speaking Skills: An Experimental Study. *Call-Ej*, 23(3), 1–23.
- McGrath, C., Farazouli, A., & Cerratto-Pargman, T. (2024). Generative AI chatbots in higher education: a review of an emerging research area. *Higher Education*, 0123456789. <https://doi.org/10.1007/s10734-024-01288-w>
- Mouvet, K., & Taverniers, M. (2022). What is Language Anyway? A View on Teaching English Proficiency in Higher Education. *International Journal of TESOL Studies*, 4(2), 8–23. <https://doi.org/10.46451/ijts.2022.02.02>
- Muti'ah, & Maulidia Azizah, V. (2024). Investigating Students Attitudes on Oral Corrective Feedback: Small-scale Survey in Academic Speaking Class. *International Journal of English Linguistics, Literature, and Education (IJELLE)*, 6(1), 26–38. <https://doi.org/10.32585/ijelle.v6i1.4824>
- Noroozi, O., Soleimani, S., Farrokhnia, M., & Banihashem, S. K. (2024). Generative AI in Education: Pedagogical, Theoretical, and Methodological Perspectives. *International Journal of Technology in Education*, 7(3), 373–385. <https://doi.org/10.46328/ijte.845>
- Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. *Science*, 381(6654), 187–192. <https://doi.org/10.1126/science.adh2586>
- Osamor, A., Ifelebuegu, Kulume, P., & Cherukut, P. (2023). Chatbots and AI in Education (AIEd) tools: The good, the bad, and the ugly. *Journal of Applied Learning and Teaching*, 6(2), 332–345. <https://doi.org/10.37074/jalt.2023.6.2.29>
- Perry, S. (2024). Podcasting as a form of assessment: increasing student motivation in academic English-speaking assessment. *Language Testing in Asia*, 14(1). <https://doi.org/10.1186/s40468-024-00288-y>
- Rahman, M. K., Ismail, N. A., Hossain, A., & Hossen, M. S. (2025). Students' mindset to adopt AI chatbots for effectiveness of online learning in higher

- education. *Future Business Journal*. <https://doi.org/10.1186/s43093-025-00459-0>
- Rouabhia, R. (1930). *Developing Academic Speaking Fluency with AI-Powered Chatbots : A Study of Second-Year Master ' s Students in the English Department at Ali Lounici University*.
- Tsunemoto, A., & Trofimovich, P. (2024). Coherence and Comprehensibility in Second Language Speakers' Academic Speaking Performance. *Studies in Second Language Acquisition*, 795–817.
<https://doi.org/10.1017/S0272263124000305>
- Wael, A., Akib, M., Hasanudin, H., & Akib, R. (2023). Autonomous Learning Strategies for Academic Speaking by English Education Department Students. *J-SHMIC : Journal of English for Academic*, 10(1), 51–62.
[https://doi.org/10.25299/jshmic.2023.vol10\(1\).10269](https://doi.org/10.25299/jshmic.2023.vol10(1).10269)
- Wijirahayu, S., Ananda, S., Ringo, N., Yunus, G. A., & Sari, Y. Y. (2024). *The Scholars ' Perceptions of Integrating Popular Culture into Academic Speaking and Writing*. 8(2), 303–317.
- Yusuf, R., Arifin, M. A., Octaviana, U., Abbas, S., Syawal, J., & Nurbaya. (2024). Integrating Local Wisdom in Character Education: A Collaborative Model for Teachers, Parents, and Communities. *Al-Ishlah: Jurnal Pendidikan*, 16(3), 3116–3131. <https://doi.org/10.35445/alishlah.v16i3.5271>