

Boosting Undergraduates' ESP Vocabulary Learning through Dialogflow Chatbot: Evidence from Foreign Trade University – Ho Chi Minh City

Thi My Dung Dang

Foreign Trade University, Ho Chi Minh City Campus, Vietnam

Abstract

This research investigates the impact of chatbot technology on English for Specific Purposes (ESP) vocabulary acquisition among business undergraduates during blended learning at Foreign Trade University – Ho Chi Minh City. The study aimed to evaluate the effectiveness of Dialogflow chatbots as an interactive learning tool for boosting students' ESP terms/vocabularies. An experimental design was employed, involving two groups: an experimental group utilizing the Dialogflow chatbot and a control group following traditional methods. Both groups participated in pre- and post-tests to assess vocabulary gains. The experimental group received access to a chatbot containing carefully designed content, including audio recordings of ESP-related vocabulary and a user manual. Furthermore, semi-structured interviews were conducted with participants from this group to gather qualitative data on their experiences and perceptions of the chatbot's effectiveness. The findings demonstrated a significant positive impact of the chatbot on ESP vocabulary learning. Students in the experimental group exhibited predominantly higher scores on post-tests compared to their counterparts in the control group, indicating substantial vocabulary improvement. The interviews revealed that students found the chatbot engaging and helpful for their independent learning. This study carries significant pedagogical implications, suggesting that chatbots can be effectively integrated into language learning environments, particularly in ESP contexts. Educators and learners are encouraged to explore the potential

E-mail: dangthimydung.cs2@ftu.edu.vn

of chatbot technology as a valuable tool for enhancing language acquisition in higher educational institutions. Further research will investigate the long-term effects and broader applications of chatbots in diverse language learning settings.

Keywords: English for specific purposes (ESP), ESP vocabulary, EFL, blended learning, chatbot

Background to the Study

For Business undergraduates at Foreign Trade University – Ho Chi Minh City (FTU HCMC), acquiring English for Specific Purposes (ESP) vocabulary is crucial. This specialized vocabulary is essential for effective communication within professional fields such as international trade and finance. FTU HCMC employs a blended learning framework, which combines traditional face-to-face classroom instruction with various online learning resources. However, traditional methods of vocabulary acquisition often prove ineffective in maintaining student engagement and ensuring long-term retention of these specific terms within this blended learning environment. Research by Hutchinson & Waters (2019) supports the notion that such conventional approaches may not sustain student interest and knowledge retention.

In response to these limitations, AI chatbots have emerged as a potential interactive and engaging alternative for language learning. Despite their promise, the application and effectiveness of these AI chatbots within the specific context of ESP higher education in Vietnam remain largely unexplored. Nguyen & Tran (2024) highlighted this gap in research regarding the use of AI chatbots in Vietnamese ESP settings. Therefore, this study was undertaken to investigate the effectiveness of Dialogflow chatbots in enhancing ESP vocabulary acquisition among Business undergraduates at FTU HCMC. The research aims to bridge existing pedagogical gaps in the field of technology-enhanced language education, particularly within the Vietnamese higher education institutions.

Literature Review

Discourse on AI chatbots in language learning emphasizes their transformative potential while noting key limitations. Lyu et al. (2024) meta-analyzed 31 studies, finding a medium effect size for chatbots in L2 learning, especially vocabulary, but criticized for short-term focus and Western bias, potentially ignoring Asian EFL cultural variations in autonomy. Qasem et al. (2023)

showed substantial Business English vocabulary gains via Dialogflow chatbots, though constrained by small, male-only samples. Similarly, Silitonga et al. (2024) reported ESP vocabulary enhancements in Indonesian students through interactive features yet lacked affective measures and blinded designs.

Romadhon (2025) found Replika AI improving ESP vocabulary with positive usability feedback but limited by sample size ($n = 44$) and vocabulary-only scope. Huang et al. (2024) reviewed chatbots for EFL speaking, highlighting engagement gains but technical issues like accent mishandling, whereas Barrot (2024) viewed ChatGPT as versatile for input/feedback, warning of dependency risks amid limited evidence. Critically, aligning with noticing theory (Schmidt, 2019), chatbots foster autonomy via exposure, yet flaws like small samples and biases demand Vietnam-specific research (Nguyen & Tran, 2024), urging rigorous validations to avoid overgeneralization.

Research Methodology

This mixed-methods quasi-experimental study engaged 40 second-year Business undergraduates at FTU HCMC (aged 19–22, CEFR B1 level). Participants were randomly allocated to an experimental group ($n = 20$) utilizing a Dialogflow chatbot or a control group ($n = 20$) employing traditional methods (e.g., worksheets). The intervention occurred over 10 weeks as part of the blended ESP course, which included weekly two-hour face-to-face classroom sessions for all participants. In addition, the experimental group was instructed to interact with the Dialogflow chatbot at least three times per week for a minimum of 30 minutes per session, either during designated self-study periods in the university's language lab or independently at home via mobile devices. This ensured focused exposure to the ESP vocabulary through interactive dialogues. The control group completed equivalent paper-based worksheets during the same self-study periods, with comparable time allocation (approximately 90 minutes per week) and content coverage to maintain parity in participant exposure to the materials. The 10-week blended ESP intervention drew from Mascull (2010), with the chatbot incorporating audio pronunciations, synonyms, definitions, and interactive dialogues. Data encompassed pre- and post-vocabulary tests (20 items each, assessing receptive/productive knowledge; Cronbach's $\alpha = 0.88$), validated by FTU experts. Semi-structured interviews with 10 experimental participants probed perceptions. Quantitative analysis via SPSS 26 included descriptive statistics, independent/paired t-tests, and Cohen's d . Thematic analysis coded qualitative data for themes like engagement. Ethical clearance was secured from FTU HCMC's Review Board.

Research Results

The study revealed that the implementation of a Dialogflow chatbot had a significant positive impact on the acquisition of ESP vocabulary among business undergraduates at FTU HCMC. At first, both the experimental group, which used the chatbot, and the control group, which relied on traditional methods, demonstrated comparable baseline vocabulary knowledge. Pre-test scores confirmed no significant difference between the groups at the study's outset, with the experimental group averaging 9.00 (SD = 3.70) and the control group 9.30 (SD = 4.10). A t-test further supported this, showing no statistically significant difference ($t(38) = -0.25, p = 0.805$).

Following the 10-week intervention, the experimental group achieved significantly higher post-test scores, with a mean of 16.40 (SD = 2.08), indicating substantial improvement in their ESP vocabulary. In contrast, the control group's mean post-test score was 11.10 (SD = 3.40). Statistical analysis confirmed this difference was highly significant ($t(38) = 5.95, p < 0.001$), with a large effect size (Cohen's $d = 1.92$), suggesting a very strong impact from the chatbot intervention. Within-group analysis showed the experimental group made significant progress from pre-test to post-test scores ($t(19) = -9.20, p < 0.001$), indicating substantial vocabulary gains for students using the chatbot. The control group also showed some progress, but to a lesser extent ($t(19) = -2.20, p = 0.040$).

Qualitative data gathered from semi-structured interviews with the experimental group provided insights into their experiences. A high percentage of responses (80%) indicated that students found the chatbot engaging. Furthermore, a significant portion of feedback (72%) revealed that students perceived the chatbot as beneficial for independent learning, promoting autonomy in their language acquisition. Participants also appreciated the flexibility offered by the chatbot, with 58% of the codes relating to this theme. However, 28% of the codes pointed to technical issues or glitches encountered during their interaction with the chatbot.

Discussion

This study found that using chatbots significantly improved vocabulary in the experimental group, supporting Schmidt's (2019) noticing hypothesis by demonstrating that chatbot interactions boost attention and retention. The effect size ($d = 1.92$) was notably higher than the average reported by Lyu et al. (2024) in their meta-analysis. This improvement, particularly in comparison to Qasem et al.'s (2023) findings, is likely due to the customized audio features

implemented at FTU HCMC, which helped overcome pronunciation challenges common among Vietnamese learners (Nguyen & Tran, 2024).

Similar to Silitonga et al. (2024), this research confirms chatbots contribute to ESP learning through their explanatory functions. However, this study's qualitative data further revealed engagement (80%) acts as a mediating factor, a point not addressed by Silitonga et al. (2024) regarding affective elements. While Romadhon (2025) also noted positive usability, FTU HCMC's blended learning environment specifically fostered learner autonomy (72%), thereby reducing concerns about over-reliance previously raised by Barrot (2024) through self-paced practice opportunities. From a pedagogical standpoint, chatbots make ESP more human-like by simulating dialogues and promoting communicative competence. However, educator scaffolding is crucial to prevent students from becoming overly dependent on the technology. The study acknowledges limitations in sample size and duration, consistent with existing literature gaps. Future research could enhance generalizability through multi-site, longitudinal studies and explore integrating chatbots with newer AI technologies to develop a more holistic range of skills.

Conclusion

This study demonstrates that Dialogflow chatbots are a transformative tool in blended learning at Foreign Trade University – Ho Chi Minh City Campus, significantly enhancing business students' ESP vocabulary for global communication. By offering interactive, human-like dialogue, these AI companions not only improve vocabulary retention and test scores but also foster student autonomy and a passion for lifelong learning, moving beyond traditional rote methods. The research highlights the immense potential of chatbots to democratize education in Vietnam, urging educators to integrate AI thoughtfully to bridge digital divides and prepare students for an interconnected world.

References

- Barrot, J. S. (2024). ChatGPT as a language learning tool: An emerging technology report. *Technology, Knowledge and Learning*, 29(2), 1151–1156.
- Huang, W., Hew, K. F., & Fryer, L. K. (2024). Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice. *Computers and Education: Artificial Intelligence*, 6(1), 1–12.

- Hutchinson, T., & Waters, A. (2019). *English for specific purposes: A learning-centred approach*. Cambridge University Press.
- Lyu, B., Lai, C., & Guo, J. (2024). Effectiveness of chatbots in improving language learning: A meta-analysis of comparative studies. *International Journal of Applied Linguistics*, 35(1), 834–851.
- Mascull, B. (2010). *Business vocabulary in use: Advanced*. Cambridge University Press.
- Nguyen, T. T., & Tran, T. T. (2024). AI chatbots in Vietnamese ESP education: Opportunities and challenges. *Journal of Educational Technology and Innovation*, 6(2), 45–62.
- Qasem, F., Ghaleb, M., Mahdi, H. S., Al Khateeb, A., & Al Fadda, H. (2023). Dialog chatbot as an interactive online tool in enhancing ESP vocabulary learning. *Saudi Journal of Language Studies*, 3(2), 76–85.
- Romadhon, R. (2025). Replika AI chatbot as a tool for enhancing ESP business vocabulary acquisition: A study on polytechnic students. *SALEE: Study of Applied Linguistics and English Education*, 6(1), 183–201.
- Schmidt, R. (2019). Attention, awareness, and individual differences in language learning. In W. C. Ritchie & T. K. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 27–50). Wiley-Blackwell.
- Silitonga, L. M., Wiyaka, & Prastikawati, E. F. (2024). Boosting students' ESP vocabulary by utilizing AI chatbot. *Eternal: English Teaching Journal*, 15(2), 275–283.