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Replika AI Chatbot as a Tool for Enhancing ESP Business Vocabulary Acquisition: A Study on Polytechnic Students

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Abstract

This study is investigating the efficacy of using a Chatbot to enhance vocabulary acquisition in ESP, particularly in Business English. A total of 44 undergraduate students from a Polytechnic University in Indonesia participated in an experimental design. The students were divided into experimental and control groups, with the former using the chatbot for 14 weeks while the latter received traditional instruction. Purposive sampling ensured that participants shared similar academic backgrounds. To test the validity and reliability, the instruments were tested on a separate group, then validated (R-count > 0.349) and shown to be reliable (Cronbach's Alpha: 0.877 for pre-test, 0.785 for post-test). Data from the results were analyzed using descriptive statistics, independent-sample t-tests, and paired-samples t-tests. Findings revealed that the experimental group significantly outperformed the control group in vocabulary retention ($t = 11.10$, $p < 0.001$), with a large effect size ($\eta 2=0.75\eta \hat{} 2 = 0.75\eta 2=0.75$). Interviews supported these results, highlighting the chatbot's practicality and user-friendliness. The study concludes that AI-driven tools like Replika can enhance vocabulary learning. Future studies need to look into the broader context of chatbot usage relating to other language skills also and the potential of this tool across educational settings and disciplines.

Keywords: Business English, chatbot, vocabulary learning

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1. Introduction

In a continuously changing educational world, educators are constantly seeking the latest in pedagogical strategies and techniques that will enhance learning for their students: to learn more, learn faster, and learn deeper (Heilporn et al., 2021). In the modern world, with technology developing at an incredible speed, education has become accessible from anywhere-anytime (Singh, 2022), which gives unprecedented opportunities for intersections between technology and language learning (Osaat et al., 2021). Such integration has shown great promise, revolutionizing how language learning in general and especially business English language learning, is experienced and delivered (Panagiotidis, 2018; R. Zhang & Zou, 2022).

Finding a quick and flexible solution that can support vocabulary growth and language ability enhancement becomes increasingly important as adult learners struggle to find time, particularly when professional commitments are involved (Çakmak et al., 2021). Consequently, Chatbots prove to be a useful tool in this situation by offering the student a more user-friendly and interactive interface that is free of all the drawbacks associated with traditional methods (Mageira et al., 2022; Sweidan et al., 2021; Terrance Lopez, 2022). Unlike human educators, chatbots do not experience constraints such as fatigue, forgetting, or unavailability. Instead, they provide uninterrupted, on-demand learning support, which is particularly useful for adult learners with tight schedules (Rezai et al., 2024).

Chatbots, as conversational learning technologies, simulate natural conversations, providing a dynamic and personalized learning experience that resembles an interaction with a colleague or co-worker (Belda-Medina & Calvo-Ferrer, 2022). Such interactions are not only practical and to the point but also engaging and enjoyable, fostering a conducive learning environment (Yin et al., 2021). A chatbot can be described as an AI-driven conversational agent that might speak in a natural language and make context-sensitive decisions premised on predefined rules and algorithms (Lin et al., 2023). Chatbots produce engaging and dynamic learning environments suited to the needs of learners by leveraging these capabilities to enhance their engagement in, and retention of, vocabulary knowledge-especially business-oriented (Melo & Santos, 2023).

Numerous studies have explored the use of chatbots in language instruction, viewing the great potential for encouraging effective language acquisition (W. Huang et al., 2022; Petrović & Jovanović, 2021). In particular, the COVID-19 epidemic caused educational institutions to speed up their use of technology to provide the world with new and creative methods to keep learning going while maintaining the pace of physical distancing measures (Dolzhich et al., 2021). This was also a period that saw an increased adoption of the use of chatbots and other digital means of creating interactive online classrooms that could, in some ways, mimic the physical and social dimensions of conventional learning environments (Herawati et al., 2022; Turnbull et al., 2021). However, despite such increased use of

chatbots, few studies have specifically focused on its effect on ESP learning, particularly in the acquisition of business vocabularies during this transformational period. Previous studies on chatbots in ESP learning have generally focused on broader language skills or specific fields such as medical and technical domains, rather than business vocabulary acquisition. For example, a study by Qasem et al. (2023) investigated chatbot use in language learning but did not target business-specific terms. Another study by Yang & Kim (2021) also addressed chatbots in education but did not focus on AI-driven platforms like Replika, which offers advanced interaction capabilities. Unlike these studies, the use of Replika AI is offering more personalized, adaptable, and engaging learning experiences. This fills a gap in the literature by focusing on business vocabulary, and highlights the role of AI-driven chatbots in fostering deeper student engagement and interaction.

This study investigates the effectiveness of chatbot Replika.ai as a promising platform for teaching business vocabulary to ESP learners. The current research concentrates on the integration of chatbots into ESP learning environments with the intention of developing an understanding of how such AI-driven tools enhance vocabulary learning outcomes that support adult learners in their language competencies to perform in professional life. This would establish whether chatbots are able to create meaningful, context-rich conversations that simulate real-world business interactions, which in turn improve vocabulary retention and practical usage skills. With the increasing integration of technology into language learning in recent years, chatbots have become one of the most promising techniques for improving the teaching of business English. The primary objective of this research is to find the extent of the difference in impact resulting from the use of a chatbot compared to traditional methods within ESP courses, particularly those related to Business English. The research focuses on three key questions:

1. Is there a significant difference in vocabulary retention between learners using chatbots and those using traditional methods for Business English?
2. What are learners' perceptions of using chatbots for learning Business English vocabulary?
3. What are the advantages of using chatbots in learning ESP courses?

1.1. Theoretical framework

1.1.1. ESP and digital technology

Rapidly developing digital technologies helped to shape the world of ESP, making it more adaptable, more relevant, and accessible for a wide range of disciplines and professional settings (Hafner & Miller, 2018). The driving force behind ESP is the need for focused language tuition in well-defined professional, academic, or social contexts. Technology has also increased the scope of ESP courses in enabling learners to participate in more

individualized, contextualized, and authentic learning opportunities (Borucinsky & Jelčić Čolakovac, 2020).

One of the cornerstones of ESP should be, by all means, the principle of needs analysis-that is, defining learners' specific linguistic needs in particular contexts (Galina Pleșca, 2010). Technology has done much to underpin this process of needs analysis by providing innovative design and delivery tools for ESP courses which reflect real-life professional scenarios (Zohoorian, 2015). Digital tools have been embedded within many successful ESP projects, offering learners simulations, authentic materials, and task-based activities, thus making those learning experiences more relevant to the future professional demands which the learner will face (Kakoulli Constantinou & Papadima-Sophocleous, 2020; Kuzmina et al., 2022; Marculescu, 2015).

Studies about application of mobile-assisted language learning (MALL) have demonstrated the critical role that digital technology plays in ESP instruction (M. Ali et al., 2024; Bieńkowska et al., 2021; Wardak, 2020). The creation and implementation of ESP curriculum, especially in fields like commerce, health, engineering, and tourism, have benefited greatly from the use of MALL tools (Dashtestani, 2013). These tools offer learners gateway to many authentic materials, interesting exercises, and simulations that replicate real-world professional situations (Pettersson, 2018). Recent studies have demonstrated that learners in ESP programs using technology show significant improvements in language proficiency, especially when it comes to technical vocabulary acquisition and practical language application in their respective fields (Chaikovska et al., 2022; Stroo et al., 2018).

In addition to these developments, digitalization allowed for the creation of more adaptable and independent learning environments (Bygstad et al., 2022). Instantaneous feedback, interactive simulations, and materials that could be accessed at a person's own pace all contributed to the dynamic and successful learning process (Crittenden et al., 2019). It has been especially useful in situations involving remote learning, such as the COVID-19 pandemic, when access to traditional classrooms was severely restricted but technology-enabled ESP programs continued to operate.

1.1.2. AI, chatbots, and English language learning

The swift rise of artificial intelligence has made significant effects on education, especially language learning (Woo & Choi, 2021). AI-driven systems are now rapidly changing the way students study languages, making learning much more personalized, adaptive, and engaging (Ruan et al., 2021). It is also equally helpful in the learning of English, as it helps with real-life conversations for the learners, allows them to get immediate feedback while practicing their language abilities in real time and personalized guidance (Johnson et al., 2005).

Recent research has centered on developing AI that can offer realistic immersion language learning environments (Haristiani & Rifai, 2021; J.-X. Huang et al., 2017; Kim et al., 2022;

Kohnke, 2023; Pokrivcakova, 2019; X. Wang et al., 2024). For instance, intelligent systems, like chatbots, facilitate learners to engage themselves in meaningful conversations, similar to the interactions native speakers would be able to offer (Z. Ali, 2020). These assure a wide range of functions, including vocabulary practice, grammar correction, even cultural context-all essential for holistic second and foreign language learning (Gomathi et al., 2023).

Among these, the application of chatbots has widely been noted as a breakthrough in language education (Kim et al., 2022). AI-powered chatbots, operating on either text or voice input, can enact a human-like conversation with the user (Fryer et al., 2019). They are easily incorporated into a variety of digital mediums, ranging from social networking sites to messaging applications. These chatbots allow learners a more engaging, non-judgmental platform to practice their language skills, which may well prove very useful to those who have little or no access to native speakers or any formal language training (Haristiani & Rifa'i, 2020). Several studies have investigated the effectiveness of Chatbots for language learning, usually with positive findings. For example, research has shown that Chatbots support vocabulary acquisition because they provide opportunities for learners to do repetition and contextualization practices (Petrović & Jovanović, 2021). Chatbots are different from other methods in that all have so far relied on rote memorization, making them a more interactive and engaging way of learning vocabulary, thus enabling learners to practice new words in meaningful contexts (Abbasi & Kazi, 2014). Additionally, Chatbots adapt to suit the requirements of certain students by offering tailored suggestions, with the tailoring of exercises to target areas of difficulty (Nagata et al., 2020).

Application-related studies on the application of chatbots in ESP settings have been conducted which claim that these tools can really help enhance learners in their acquisition of domain-specific vocabulary, whether those are business or other technical terms (Strinyuk & Lanin, 2022). Chatbots can simulate workplace conversation and professional interactions. This may help the ESP learners get comfortable with the specialist vocabulary and language structures required in the work environment (Y. Wang et al., 2024). This becomes particularly relevant in the case of adult learners who can devote little time to formal study but must have focused language training if they are to perform their job responsibilities effectively (Kovačević, 2023).

1.1.3. Vocabulary learning and chatbots

Acquiring vocabulary is a crucial component of language learning as it fills in the conceptual blocks which learners will have in describing ideas, understanding complicated concepts, and hence communicating effectively (Jia et al., 2012). In second or foreign language learning, expansion in vocabulary is highly needed for learners to gain fluency and proficiency. A

range of methods has been devised to help learners learn new vocabularies, from the more conventional flashcards to increasingly interactive and technology-driven approaches.

The introduction of AI, especially chatbots, into vocabulary learning has opened new perspectives concerning language acquisition (Jeon, 2023). Recent studies have illustrated that chatbots can serve as an effective means in vocabulary learning because they are capable of creating interactive and dynamic learning environments (Alsadoon, 2021; Polyzi & Moussiades, 2023). Unlike other unidirectional learning methods, a chatbot interacts with the learner live-like, thus enabling them to try out the feedback they get at once or to use new sets of words in context (Qasem et al., 2023b). This contextualized practice is crucial for consolidating vocabulary retention and enhancing the ability of learners to use new words appropriately (Na-Young, 2018).

A few studies underlined the benefits of using chatbots when building vocabulary, especially in ESP (Ahmed et al., 2023; Na-Young, 2018; Y. Wang et al., 2024). Subjects who practiced vocabulary by means of using chatbots outperformed their peers working in traditional conditions by retaining the words and getting a deeper understanding of what they meant. This then makes it possible for the chatbot to provide repeated exposure to the new vocabulary in multiple contexts, which is called for if the learner should recognize and be able to use new words both in speaking and writing. Enhancement of learning also allows a chatbot to grade the difficulty level of exercises and target those specific areas of vocabulary that are in greater need of practice.

2. Method

2.1. Research design

This research was conducted to investigate the impact of employing chatbots on ESP students' acquisition of vocabulary. This research uses an experimental study design (PH. and Chang, 2009) involving two classes of undergraduate students pursuing the Business English program at Polytechnic University in Serang, Banten Indonesia. This experimental design allowed for a controlled comparison between students who used chatbots and those who followed a traditional learning approach. By randomly assigning participants to an experimental and control group, the research aimed to isolate the effect of chatbot usage on vocabulary acquisition, ensuring that any observed differences in learning outcomes could be attributed to the intervention itself.

2.2. Participants

In this study, the population consisted of 124 first year students attending the Diploma 4 (D4) program-a four-year higher education program adopted in Indonesia. 44 first-year students in the Digital Business study program who had completed one semester of English for Specific Purposes (ESP) were chosen as study participants. Since most of the individuals had around the same level of competence based on their first semester GPA, purposive sampling

was used to select these participants rather than randomized sampling. It was also to make sure the sample was especially suited to the requirements of the study, purposive sampling was used (Mweshi & Sakyi, 2020). The sample was then assigned into an experimental (N=22) and a control group (N=22) with the total of 44 students.

In an experimental group, instruction with chatbot dialogue was provided for 14 continuous weeks, while traditional instruction without assistance from any kind of chatbot was given to the control group. Both groups were taught with the same materials taken from the textbook "Business Vocabulary in Use: Intermediate Book with Answers - Self-Study and Classroom Use" by (Mascull, 2017). The chatbot that was utilized for this research is "Replika: My AI Friend," a mobile application in which interaction is easy, thus making it accessible for participants to use both inside and outside the classroom for their assignments and tasks.

2.3. Instruments and procedure

A pretest and posttest were the primary instrument for this study. The tests carried out on both groups to ensure their homogeneity in vocabulary knowledge and proficiency levels in English. Pre-test also measured participants' proficiency in business vocabulary and verified that both groups were equal in proficiency. Before administering the instruments to both the experimental and control groups, the pre-test and post-test underwent both validity and reliability tests for this study. Initial testing was conducted on another group, AP23A class consisting of 30 students, to see that the instrument was appropriate to be used for measuring the students' vocabulary. The validity test showed that all 20 questions in the pre-test and post-test reached R-count values higher than the R-table value of 0.349, meaning that the questions were valid and appropriate. Another procedure for determining the quality of the instrument was its reliability test via Cronbach's Alpha. The Cronbach's Alpha for the pretest was 0.877, representing a highly reliable level. In the meantime, the Cronbach's Alpha for the post-test was 0.785, revealing a moderate to high level of reliability.

Throughout the experiment, the two groups met once every week for 14 continuous weeks; both groups received identical instruction but through different modes. That is, the experimental group needed to work with the chatbot both in-class and for homework assignments, while the traditional approach with no engagement with the chatbot was provided to the control group. The experimental group was taught how to use the chatbot effectively. Replika AI was used in this study due to its accessibility, usability, and the potential to create an interactive and engaging learning environment. Being a mobile application, Replika is practical for students to use both inside and outside the classroom, requiring minimal technical skills. Its real-life conversation simulation makes direct feedback and contextualized practice key, especially when reinforcing new vocabulary in specialized contexts such as Business English. Adaptability means the chatbot may target an individualized learning experience on particular points where students have weaknesses, thus

improving the ability of retention and practical usage of vocabulary. Besides, Replika follows the general trend of education, which is inclusion in the process of learning AI-driven tools that provide an individualized, flexible, and efficient approach to learning solutions, particularly in cases where adult learners have professional commitments to balance. This combination makes Replika an effective, innovative tool for enhancing ESP vocabulary acquisition. Every week, the experimental group worked with the chatbot as part of their vocabulary learning activities, which allowed them to expose themselves to new terms in simulated conversational situations. It was used as an interactive learning companion that provided direct feedback and practice opportunities contextualized to reinforce new business vocabulary.

The control group was treated to the very same content curriculum, delivered through traditional methods: teacher-directed explanation and practice without digital supports. At the end of the 14-week instructional period, both groups were measured for their gain in vocabulary through a post-test. The vocabulary test was developed based on the content in the textbook and consisted of 20 items that measure how well the participants had learned and retained the terms related to business. The post-test was devised to check, particularly, how effective the employment of chatbots for learning vocabulary is compared to more traditional methods.

Besides quantitative methods, an interview was also conducted to obtain deeper qualitative information from the participants and further explore insights in the research questions. The interviews were used in the study for the purpose of eliciting feedback in detail from the students in regard to how the use of a chatbot conversational program was beneficial and at what precise aspects it was productive for their learning experience. To this end, an interview protocol was carefully prepared and administered to the selected demonstrators. For convenience on both sides of the study, the interview questions were administered digitally using Google Forms, so that the participants would be free to do so at any time and in any location where they felt comfortable. This method ensured flexibility and accessibility, considering the busy schedules of the students demonstrating. This interview was made up of eight questions, three of which were open-ended. The open-ended questions were suggested to provide the participants with an opportunity to give more elaborate responses and state their opinions freely, thus allowing for deeper insights into the experiences they had with the chatbot. All 22 students from the experimental group participated in the interview, which constitutes a representation of the class.

2.4. Data analysis

The Statistical Package for the Social Sciences, version 26, was used to analyze quantitative data. Initially to provide a broad picture of the two groups' performance, descriptive statistics, mean and SD were computed from the data. An independent-sample t-test was used to compare the experimental and control groups' performance on the pre- and post-tests. To

determine each group's gain from the pre-test to the post-test, the researcher used a paired-samples t-test. Therefore, the current study investigates whether the two groups' vocabulary growth differs significantly and whether the Chatbot-based approach proved to be more effective for enhancing ESP vocabulary knowledge among students compared to the traditional one.

3. Finding and Discussion

3.1. Findings

The first key finding of this study directly points to the first research question. A comparative analysis between pre-test and post-test scores of the experimental and control groups was done to answer the first research question. Both descriptive statistics and t-tests were done for data analysis to address the first research question, which aimed at finding out if the use of chatbots had a statistically significant effect on learning Business English vocabulary. First, descriptive statistics were calculated to have an overview of the performance of the experimental and control groups concerning vocabulary acquisition. Included in this were descriptive statistics of key measures of mean and standard deviation that would be compared later for analysis of central tendencies and variability in their scores on the vocabulary tests. Table 1 below shows these descriptive statistics:

Table 1. Pre-test result

Groups	N	Mean	SD	F	Sig	t	Df	Sig. (2-Tailed)	M. Difference	η^2
Experiment group	22	49	5.26	0.16	0.6886	-0.30	42	0.77	-0.45	0.002
Control group	22	49	4.86							

First, to ascertain if there was a significant distinction among the two groups prior to the experiment, a t-test analysis of the pre-test was conducted. It pointed out that there was no noticeable distinction between the two groups' levels of vocabulary proficiency ($t = -0.30$, $p = 0.77$). This mean difference was small, mean difference = -0.45, with an extremely low effect size ($\eta^2 = 0.002$), indicated that both groups were almost the same in their initial knowledge of vocabulary prior to the intervention. A non-significant difference like this proves that any modifications in the post-test findings were brought about by the intervention and not by the groups' underlying differences.

To address the first research question, the performance of the participants was therefore compared post intervention to answer the first research question. Means and standard deviation in participants' performance across post-tests was examined to see whether the chatbot intervention significantly improved learning outcomes. Table 2 below shows the

results on variation in mean score and the variation in their standard deviation, giving a more indicative view of the impact that would have been caused by the Chatbot on Business English vocabulary learning.

Table 2. Post-test result

Groups	N	Mean	SD	F	Sig	t	Df	Sig. (2-Tailed)	M. Difference	η^2
Experiment group	22	81	6.12	0.89	0.35	11.10	42	0.00	22.73	0.75
Control group	22	58	4.97							

Following the intervention, the average scores of the experimental (chatbot) group and the control group differed statistically significantly, as seen in table 2. The analysis of t-test revealed that t = 11.10 (42), p = 0.000 two-tailed, thereby meaning that the use of chatbots had significantly positive influences on vocabulary acquisition compared to those in the control group. The difference is statistically significant by the very low value of p-value: 0.000 far below the conventional threshold level of 0.05. The difference in the means (mean difference = 22.73) was considerable, further highlighting the effectiveness of chatbot-based learning. The effect size ($\eta^2 = 0.75$) was large, indicating that a substantial portion of the variation in post-test scores can be attributed to the use of chatbots in the experimental group.

Research question two and three explore the attitude of learners with regards to their view about the chatbot intervention when learning business English vocabulary and the advantage of the use of chatbots. Both quantitative and qualitative analyses are used to gauge the response of the respondents. Thematic content analysis of the data has been performed for open-ended questions, whereas close-ended items were analyzed using descriptive analysis.

In the first closed question concerning the ease or difficulty of using the chatbot, all the respondents had indicated the use of the chatbot being easy. To its appropriateness with regard to application in other courses, 86.36% agreed that it should be used in other courses while 13.64% showed that it might be useful. Surprisingly, 100% confirmed having already used it in other courses. Also, regarding if chatbots help them remember vocabulary, 90.91% agreed that yes, indeed chatbots have considerably helped them remember, while 9.09% said perhaps chatbots did help them. Besides, 81.82% believe that in the future they will make use of the chatbot in academic matters and 18.18% are not sure if they will do so. Among the open-ended questions, it was mentioned that with the chatbot they understand the meaning of words after a while and explained words with multiple meanings clearly. Others also said that "Sometimes, a chatbot confuses the meaning of vocabulary.", saying that "The internet connection must be good when I use the chatbot.". Also, in order to improve,

"interface simplification maintains focusing on vocabulary and enables work offline.". They also suggested that the instructors should let the chatbots be used on all courses.

3.2. Discussion

Chatbot integration in language learning is becoming more and more popular, especially within the ESP context. The goal of the current study was to evaluate how well chatbots can improve ESP vocabulary learning, particularly when it comes to business English. Consequently, data analysis revealed that the experimental group using chatbots did better than the control group using the conventional method. It confirms other previous studies showing how efficient chatbots are in fast-tracking language learning.

In recent research, Y. Wang et al. (2024) studied a generative AI-based human-machine interactive vocabulary learning model (ChatGPT), with an emphasis on educational technology-related vocabulary. Their study also examined learners' outcomes and experiences, finding that AI tools significantly enriched learners' vocabulary understanding. Similarly, Z. Zhang & Huang (2024) explored the potential of large language models (LLMs) as promising educational tools, emphasizing their positive effects on skill development, educational efficiency, learner motivation, and accessibility. These studies, along with the current research, confirm the growing importance of chatbots in education, particularly in enhancing vocabulary learning and overall language proficiency in specialized fields like Business English.

The findings of this study demonstrate that using chatbots to support the learning of ESP vocabulary significantly enhances learners' understanding and development of specialized language skills. This confirms that the integration of digital technologies, such as chatbots, serves as a gateway for better comprehension of ESP vocabulary and overall improvement in ESP materials. Asmali (2018) emphasized the importance of integrating technology with ESP to improve course design and instructional development. The positive impact of chatbots in acquiring ESP vocabulary further supports the idea that digital tools can enhance teaching methods and facilitate language learning, especially for teachers aiming to improve learners' L2 or ESP vocabulary proficiency and course content.

In line with this, several studies have confirmed the positive effects of technology on ESP learning. Synekop (2020) found that WebQuests can be applied to differentiated instruction, catering to students' varying learning styles and English proficiency levels. Similarly, digital social media have proven to be productive tools in learning ESP textbooks and fostering ESP knowledge, particularly by enhancing classroom communication and promoting autonomous learning (Saienko et al., 2020). Additionally, El-Said (2023) The use of the Duolingo chatbot helped students reduce grammatical errors, improve pronunciation, and develop greater fluency in spoken English. The study concluded that integrating AI tools like chatbots into language learning can effectively enhance students' oral communication skills, and it

recommended the incorporation of such tools in the Egyptian educational context for teaching English.

Most of the experimental group's interview responses supported the use of chatbots to teach ESP vocabulary. The majority of participants thought the chatbot was a useful and entertaining way to improve their vocabulary in ESP Business English. They said it was simple to use the Chatbot and also minimizing challenges or difficulties during practice. The feedback suggests that Chatbots, as well as other technological applications, can be highly beneficial in language learning. This study might provide a starting point for further investigations into the efficacy of incorporating technology in ESP and other educational situations.

Participants also expressed strong support for incorporating digital tools, programs, and software like chatbots into the teaching of ESP and other courses. Their responses align with the growing recognition of smart tools and advanced technologies, especially AI-driven platforms, in transforming the learning landscape. This study reinforces the idea that future academic research and educational practices will likely embrace AI technologies, such as chatbots, to revolutionize learning. As highlighted by Rawas & AlSaeed (2024), the rise of AI-powered tools, including innovations like ChatGPT, is poised to lead a new trend in education, reshaping how students engage with learning materials and academic research.

4. Conclusion

The present study demonstrated the significant impact of chatbot integration on enhancing the vocabulary acquisition of ESP (Business English) learners. The experimental group, which used a chatbot for 14 weeks, outperformed the control group in post-test scores, indicating that Chatbots are effective tools for learning specialized vocabulary. This was further supported by the interview responses, where students found working with the Chatbot easy and of considerable help to make engaging with ESP vocabulary both easy and satisfying. It would seem, therefore, that incorporation of AI-driven tools like chatbots into language learning can have positive effects on learner outcomes and bring about a more interactive, focused learning environment. However, this study has its limitations, too. The sample size was limited and drawn from just one institution, which will affect generalization. The present study focused only on the acquisition of vocabulary alone and did not consider other aspects of language acquisition, such as writing or speaking skills, which may also be aided with the usage of chatbots.

Future studies should expand this scope by increasing both the population size and diversity while focusing on other language skills and/or other disciplines that could be affected by chatbots. A further interesting line of research would investigate the application of English chatbots in ESP, specifically targeting vocabulary relevant to professional domains like engineering, health sciences, and tourism. Researchers may also look into the

potential of the use of Replika chatbots in simulating professional dialogues, thus giving context to target structures and vocabulary to specific industry. Apart from that, studies could also investigate their effectiveness in developing other language skills, such as writing, speaking, or cultural competence, within ESP contexts. This study's findings imply that educators and institutions should consider incorporating AI-powered tools into their curriculum to enhance learning outcomes, particularly in specialized fields like ESP. Vocabulary retention and the integration of chatbots into blended learning models could further inform guidelines for effective technology adoption in ESP classrooms. As technology continues to evolve, such tools may revolutionize traditional pedagogical methods and provide learners with more personalized, efficient, and accessible educational experiences.

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