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Maximizing ESP Learning with Chatbot Technology: An Evaluation of Effectiveness

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Abstract

This study investigated how students of vocational higher education could use chatbot technology as a digital learning resource. According to the research findings, the chatbot responded students' questions instantly and provided a helpful resource for discovering specific information. The chatbot also served as a handy learning tool that was accessible anywhere and at any time, allowing for individualized and independent learning experiences. Furthermore, the interactive features of the chatbot promoted interesting discovery and interactive education, which improved student involvement in many learning contexts. Improvements are also proposed, including the development of chatbot capability for instant messaging programs, the integration of student scoring capabilities, and the expansion of topic coverage through linkages to other particular courses. A more thorough understanding would result from these improvements.

Keywords: *Chatbot technology, Digital Learning Tool, Vocational Higher Education, English for Specific Purposes (ESP)*

1. Introduction

The era of the society 5.0 shifts the daily of human beings in every aspects of life (Oktafiandi et al., 2022). Technology changes the terms pf competitive into specific terms, which are competitive human resources with the presence of Artificial Intelligence (AI). This encourages today's society to become an advanced society in terms of human resources and the use of technology (Rahmawati et al., 2021). The switching is from the classroom into world-wide learning through the use of technology. As a vocational subject, ESP is no exception from this remarkable change. Limited contact in the classroom has now became insignificant obstacle that technology can remove the barrier. Not only be able to learn outside the classroom, technology leads students to learn in time they desire (Agustiani et al., 2021; Ayuningtyas, 2018).

Chatbot is one of the media which is advance and popular. The similarity of chatbot use and teaching method makes chatbot superior than any other AI technology. Chatbot is an interactive computer program which is developed to simulate the conversation with robot over the internet through texts, sounds and visuals. In educational settings, chatbot is a beneficial instrument in teaching and learning process. Beside its practicality, interactivity, and attractivity chatbot is proven to boost students' motivation in learning (Laksana & Fiangga, 2022; Zulkarnain et al., 2020).

A careful classification and identification is needed for developing an effective chatbot. The consideration of the users, their background, their goals as well as the accessible usability became the bases of chatbot development. The chatbot should be developed by focusing on user accessibility. Therefore, to decide whether a chatbot is successful, two questions should be answered. Firstly, whether the chatbot could reach the knowledge which is needed and secondly, whether the chatbot provide answers as desired (Abbasi et al., 2019; Ayuningtyas & Oktafiandi, 2024).

Educational institutions are counted on utilizing the chatbots to accommodate the interactive learning (Labadze et al., 2023). As the chatbots provide time-saving assistance feature which gives students instant reply to the knowledge they search as well as instant access to the knowledge (Baskara, 2023; Ni, 2024). Chatbots are also a problem solving tool which provide answers to repetitive questions, this feature is admitted to help teacher administering another task (Garcia et al., 2018). Moreover, chatbots are believed to support the learning process to be more engaging, interesting as well as entertaining as they could access the knowledge on

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the gadgets every time and everywhere (Vanichvasin, 2021).

The implementation of chatbots has been recorded in several research with positive images. In the pandemic era, around 2020 – 2021, it is found that the implementation of chatbots for junior high school students immerses a result that chatbots become an efficient yet easy media of learning for long distance teaching and learning (Zulkarnain et al., 2020). This is paralleled to the research done by Parina et al. (2022) which concludes that the development of chatbots as the media of teaching and learning provides adequate materials for the students to learn independently as well as administers the quizzes for review.

In English teaching and learning process, chatbots contributed to students in fostering their autonomous conversation skill as the students are able to practice their English whenever wherever possible. The chatbots are also equipped with self-evaluation program which students can access to measure their English proficiency in speaking (Afrianto et al., 2019). The research result of Ayuningtyas & Oktafiandi (2024) enhances the previous theory that the interactive learning can foster the enjoyable learning which leads to new experience in teaching and learning process. Therefore students are found motivated (Parina et al., 2022) yet helpful (Labadze et al., 2023).

Nevertheless, the positive image of chatbots, the students' points of view have not been widely mentioned. Moreover, chatbot research with the background of ESP or vocational institution is lacking as the potential of utilizing it so far has not been deeply investigated. This research aims to not only develop the chatbot but also to evaluate students' perception of chatbot efficacy in the background of a vocational higher education, particularly for English for Specific Purposes (ESP) course.

Objectives:

1. To develop the chatbot as a learning tool for ESP
2. To evaluate students' perception on chatbot efficacy

2. Methodology

The study employed a mixed-methods design. The usefulness and applicability of the chatbot were the subjects of the quantitative study. The recommendations and comments from experts were relevant to the qualitative research. The research was divided into two phases. First was the chatbot's development. Second was putting the developed chatbot into practice to find out students' perception on its efficacy.

Sixteen business administration students enrolled in an English correspondence course participated in this study. Participants were chosen based on their registration in the course and their willingness to participate. There were no further inclusion or exclusion requirements used. The students consist of four males (25%) and twelve females (75%) which mostly aged more than 20 years (87.5%). They were not new to technology as they (93%) use gadget more than 4 hours a day.

The purpose of designing and developing the chatbot was to investigate its efficacy. The details were as follows. Using the smojo.ai platform, the chatbot was developed with a significant emphasis on usability, content organization, and content reliability. The content matched with the English Correspondence material. An evaluation form was used to assess the chatbot by three experts. The evaluation form was consisted of twelve items of three areas which are content of knowledge (4 items), organization of content (3 items) and application of chatbot (5 items). They were on the 1-4 Likert scale basis which stands for 1 is strongly disagree to 4 is strongly agree.

The average score evaluation standard was set at four levels: 1.00-1.74 being the lowest, 1.75-2.49 being lower, 2.5-3.24 being higher, and 3.25-4.00 being the highest. The chatbot's applicability was determined to be appropriate at levels higher to highest (2.5-4.00). In addition to the questionnaire, the experts provided input on the revised version of the chatbot. Following improvements, the chatbot was made available for students to utilize.

There were eighteen items on the second questionnaire. Nine categories were used to measure the efficacy of the chatbot, and each category included two items: quickness, flexibility, convenience, interaction, providing information, searching information, familiarity, learning and satisfaction. The 1-4 Likert scale was used: 1(strongly disagree) to 4 (strongly agree). The value of 1.00-1.74 was the lowest, 1.75-2.49 being lower, 2.5-3.24 being higher and 3.25-4.00 being the highest was the grading norm for average scores. The applicability of the chatbot was found to be effective at levels 3-4.

To collect data, a Google Form was utilized to gather opinions both from experts and students. The research questionnaire employed in this study was adapted from a paper written by Vanichvasin (2021). Once all responses were collected, SPSS version 26 software was used for analyzing data.

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This included descriptive statistics and any other relevant statistical analyses required for interpreting their opinions regarding chatbot applicability. The data was analyzed using mean, standard deviation and content analysis.

3. Findings and Discussion

Development of the Chatbot

The chatbot was design and developed using template form smojo.ai. it is a platform where chatbot could be developed by everyone. The template used for the chatbot was an ACITA template. ACITA is a template which is suitable for creating a learning tool for schools or other institutions. The template then was developed based on the materials needed for the English Correspondence Course.

There were few steps in developing the chatbot. Firstly, understanding the template. That material should be adapt based on the template, which material in which template. Second, preparing the materials. Third, inputting the materials to the template. This step was the most time consuming due to the formula should be considered in order to the chatbot running smoothly. The last step is testing the chatbot, whether all the formula agree the concept, whether all the materials could be seen properly, whether the image, video or sound rightfully. The chatbot could be used via link which was shared. It could be run via smartphones and laptop.

Then the chatbot was verified by three experts with strong expertise and experiences in both education and IT service. The applicability for chatbot then checked and compiled before implementing the chatbot to teaching and learning process. The chatbot applicability for use was demonstrated in table 1.

Table 1. *Chatbot Applicability from Experts' Points of View (POV)*

Chatbot Applicability	$\bar{X}$	S.D.	Interpretation
Content of Knowledge			
1. Content is related to research knowledge	3.3	0.57	Highest
2. Content covers necessary research knowledge	3.00	0.00	High
3. Content of research knowledge is suitable for students	4.00	0.00	Highest
4. Content of research knowledge is easy to understand	3.66	0.57	Highest
Organization of Content			
5. Organization of content is typing through text messages	3.00	0.00	High
6. Organization of content is interesting	3.66	0.57	Highest
7. Organization of content is interactive	3.66	0.57	Highest
Application for Chatbot			
8. Chatbot is easy to use	3.33	0.57	Highest
9. Chatbot can be used at anytime and anywhere	3.33	0.57	Highest
10. Chatbot provides research knowledge students need	3.33	0.57	Highest
11. Chatbot provides research knowledge in short time	3.00	0.00	High
12. Chatbot provides correct answers	4.00	0.00	Highest
Total	3.44	0.04	Highest

It could be seen in Table 1 that the chatbot applicability showed Highest (3.44) for the overall mean with the standard deviation of 0.04. It was also demonstrated that the Content of Knowledge had three highest item and one high item. The high item was number 2 (Content covers necessary research knowledge for the experts had not been familiar with the course of English Correspondence in particular. The Organization of content showed one item for high and two items for highest. The high item, which was number 5 (Organization of content is typing through text messages). This showed that the chatbot interacted not only by typing text messages but also clicking options. The last section for chatbot applicability was Application for Chatbot which had five items. The four items were in highest, while one item in high. The item in high was number 11 (Chatbot provides research knowledge in short time). The experts' feedback came out that the chatbot needs to be shorten to provide the material instantly. That the students need to click on options first before getting the knowledge needed. The feedback also turned out to add some particular part for the chatbot to be well-improved. The chatbot was advised to include pages number for the chatbot, for the ease of chatbot use. Next improvement needed; the experts' said was to show quiz score at the end of the quiz provided.

Students' Points of View (POV) about the Chatbot Efficacy

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The implementation of the chatbot began at the beginning of the semester. The chatbot was used for accompanying students going through the semester for blended learning semester. The meeting was done both in class and home. Students therefore were given choices to study on their most available time. They were allowed to share their thoughts on chatbot effectiveness at the end of the semester. Table 2 below showed the mean and standard deviation of students' POV on chatbot effectiveness.

Table 2. *Students' POV on Chatbot Effectiveness*

Students' POV on Chatbot Effectiveness	**$\bar{X}$**	**S.D.**	**Interpretation**
Quickness			
1. The chatbot provides instant responses after typing texts	4.00	0.00	Highest
2. The chatbot shortens time in waiting for responses	4.00	0.00	Highest
Flexibility			
3. The chatbot can be used at anytime anywhere	3.68	0.79	Highest
4. The chatbot can be used via any devices	3.75	0.77	Highest
Convenience			
5. There is no need to download any application	3.50	1.03	Highest
6. The chatbot is easily accessible whenever needed	3.56	0.72	Highest
Interaction			
7. The chatbot interacts through text messages	3.75	0.44	Highest
8. The chatbot interacts in the same context typed	3.81	0.40	Highest
Providing Information			
9. The chatbot presents research knowledge	3.93	0.25	Highest
10. The chatbot provides research knowledge needed	3.56	0.51	Highest
Searching Information			
11. The chatbot shortens time in searching	3.50	0.73	Highest
12. The chatbot gives right answers searched	3.93	0.25	Highest
Familiarity			
13. The chatbot can work on Facebook, which students are already accustomed to this instant messaging platform	2.06	1.43	Low
14. There us no need for technical skills or proficiency to use chatbot technology as it is very easy to use	2.68	1.40	High
Learning			
15. The chatbot stimulates interest in learning	3.68	0.60	Highest
16. The chatbot stimulates engagement in learning	3.87	0.34	Highest
Satisfaction			
17. The chatbot provides research knowledge in a fun, interesting and innovative way	3.62	0.80	Highest
18. The chatbot is effective when used as digital learning tool to provide personalized support	4.00	0.00	Highest
Total	3.60	0.41	Highest

Table 2 demonstrated that there were three items revealed the highest mean. Those items were in the section on Quickness (2 items) and Satisfaction (1 Item). The item number 1 (The chatbot provides instant responses after typing texts) demonstrated that students agreed on chatbot giving them instant response after typing. What they type was what they get. The next item got highest mean was number 2 (The chatbot shortens time in waiting for responses). It appeared that students preferred the instant reply to their message. Students chose quick response to their searching of knowledge. They needed a short time waiting for getting knowledge they needed for the course. The blended learning semester appeared to be the reason why students needed a tool to help them study independently. This was also appeared in the highest mean score in the number 18 (The chatbot is effective when used as digital learning tool to provide personalized support) which displayed the mean score of 4. It was stated that chatbot could be a digital learning tool for students learning independently. Students could utilize chatbot in the time they wanted, every time everywhere.

The main findings indicated utilizing chatbot as a digital learning tool for vocational higher students assisted students effectively. There were three sub findings. The first was the chatbot provided instant reply to students' research knowledge. This was in

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line with Vanichvasin (2021) who found that by using chatbot Students would be able to look for specific information without having to wait for a response and receive answers right away. Furthermore, chatbots can give students immediate feedback, enabling them to make better decisions and obtain understanding of their learning process (Baskara, 2023).

The second was the chatbot functioned as students learning tool to-go. It meant that the chatbot could be used every where every time. This finding agreed to the findings of Labadze et al. (2023) who stated that chatbot could role as a personalized learning tool that could be accessed wherever whenever students need. Furthermore Baskara (2023) found that chatbots can enhance critical thinking and student engagement in a variety of learning environments, including blended and online learning. therefore, chatbot was a big help for students to learn independently in their own time and pace.

The third was that the chatbot was equipped with interactive materials. This was also in line with the research result of few experts. It was stated that the chatbots provide interesting exploration (Ni, 2024) yet interactive face (Sarosa et al., 2018). Students were aware of an interactive learning by having similar questions and answer session with the teacher (Anwarulloh, 2019). With the help of internet, chatbot could be used interactively from afar that students did not lost their relation to materials or teacher (Zulkarnain et al., 2020). It was a huge impact for the teaching and learning process, due the ambience of studying in the classroom could be created over the students' room.

4. Conclusion and Recommendation

Chatbot provided personalized learning which makes students: having immediate answer for the knowledge research, obtaining an interactive ambience of study, and carrying their references every time. Given the small population and sample size, the positive outcome allows the research to be conducted on a larger scale. Furthermore since the chatbot still fails to receive any student scores, it also needs to be improved. To make the content denser, wider, and more comprehensive, the chatbot could have connections to other English for Specific courses. The most prominent, the chatbot needs to be built over instant messaging application for next research.

References:

Abbasi, S., Kazi, H., & Hussaini, N. N. (2019). Effect of Chatbot systems on student's learning outcomes. *Sylwan*, *163*(10), 59–60.

Afrianto, I., Irfan, M. F., & Atin, S. (2019). Aplikasi Chatbot Speak English Media Pembelajaran Bahasa Inggris Berbasis Android. *Komputika : Jurnal Sistem Komputer*, *8*(2), 99–109. https://doi.org/10.34010/komputika.v8i2.2273

Agustiani, M., Ningsih, S., & Muris, A. A. (2021). Students' Learning Motivation Through Edmodo: Blended Learning in Esp Classroom. *Research and Development Journal of Education*, *7*(1), 39. https://doi.org/10.30998/rdje.v7i1.7670

Anwarulloh, T. P. (2019). Pembangunan Aplikasi Chatbot Einstein Sebagai Guru Virtual Pembelajaran Fisika Di Ru_mah Menggunakan Api Google Dialogflow Berbasis Android. *Elibrary.Unikom.Ac.Id*.

Ayuningtyas, P. (2018). Whatsapp: Learning on the go. *Metathesis: Journal of English Language, Literature, and Teaching*, *2*(2), 159. https://doi.org/10.31002/metathesis.v2i2.629

Ayuningtyas, P., & Oktafiandi, H. (2024). Chatbot AI Platform Sebagai Media Peningkatan Kemampuan Belajar Siswa. *Jurnal Ekonomi Dan Teknik Informatika*, *12*(1), 1–6.

Baskara, F. R. (2023). The potential impact of chatbots on student engagement and learning outcomes. *The Journal of English Teaching for Young and Adult Learners*, *2*(2), 51–61. https://doi.org/10.4018/979-8-3693-0205-7.ch012

Garcia, G., Fuertes, M., & Molas, N. (2018). Briefing paper: chatbots in education. In *Universitat Oberta de Catalunya (UOC)*. http://openaccess.uoc.edu/webapps/o2/handle/10609/85786

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

Laksana, F. S. W., & Fiangga, S. (2022). the Development of Web-Based Chatbot As a

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e-issn : 2579-3322

Mathematics Learning Media on System of Linear Equations in Three Variables. *MATHEdunesa*, *11*(1), 145–154. https://doi.org/10.26740/mathedunesa.v11n1.p145-154

Ni, L. B. (2024). The Impact of Chatbot Technology on Enhancing Historical Learning in K-12 Education. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, *9*(1), e002656. https://doi.org/10.47405/mjssh.v9i1.2656

Oktafiandi, H., Ayuningtyas, P., Mauludin, L. A., Oktafiandi, H., Ayuningtyas, P., & Mauludin, L. A. (2022). Penjurian Lomba IT Software Solution for Business dalam Lomba Kompetensi Siswa SMK Kabupaten Purworejo Tahun 2021. *Abdi Wina*, *2*(1), 1–9.

Parina, R., Wijaya, A., & Apridiansyah, Y. (2022). Aplikasi Chatbot Sebagai Media Pembelajaran Interaktif SD N 17 Kota Bengkulu Berbasis Android. *Jurnal Media Infotama*, *18*(1), 121.

Rahmawati, M., Ruslan, A., & Bandarsyah, D. (2021). The Era of Society 5.0 as the unification of humans and technology: A literature review on materialism and existentialism. *Jurnal Sosiologi Dialektika*, *16*(2), 151. https://doi.org/10.20473/jsd.v16i2.2021.151-162

Sarosa, M., Kusumawardani, M., Suyono, A., & Sari, Z. (2018). Chatbot Pembelajaran Bahasa Inggris Berbasis Media Sosial. *Seminar Nasional Penelitian Dan Pengabdian Masyarakat*, 182–188.

Vanichvasin, P. (2021). Chatbot Development as a Digital Learning Tool to Increase Students' Research Knowledge. *International Education Studies*, *14*(2), 44. https://doi.org/10.5539/ies.v14n2p44

Zulkarnain, M. A., Raharjo, M. F., & Olivya, M. (2020). Perancangan Aplikasi Chatbot Sebagai Media E-Learning Bagi Siswa. *Elektron : Jurnal Ilmiah*, *12*(2), 88–95. https://doi.org/10.30630/eji.12.2.188