

THE EFFECTIVENESS OF ARTIFICIAL INTELLIGENCE BY CHATBOT IN ENHANCING THE STUDENTS' VOCABULARY

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ABSTRACT

This research aims to find out the effectiveness of artificial intelligence (AI) by chatbot in enhancing the vocabulary students at FKIP Universitas HKBP Nommensen Pematangsiantar. The focus of the research is on the vocabulary skill in teaching English. This research uses the qualitative research methods and used interview and documentation from the students. There are 30 students for the subject of the research out of 70 students in English Vocabulary class of the first semester in English department of Universitas HKBP Nommensen Pematangsiantar. The results of the research are the artificial intelligence application through chat bot enhance the students' vocabulary in learning English. The students feel enjoy, fun, easy to learn the English words. It can be applied in writing notes diary, essay paragraph in English. The researcher suggests the user of English such as lectures, teachers to use AI chatbot in the classroom instruction because it can be more effective for the students to get the meaning of the words in English. Hopefully the next reseacher can develop the research for more varying language proficiency. The result is that the artificial intelligence affect to the effectiveness in enhancing English vocabulary of the university students. It shows that all participants are enthusiastic, happy, and motivated because this application is still unfamiliar to participants. Participants also know the use of this application, so they can indirectly learn independently whenever and wherever participants.

Key words effectiveness, artificial intelligence, chatbot, vocabulary

Introduction

The development of artificial intelligence (AI) technology has brought an impact on learning English foreign language such as vocabulary improvement. English is a crucial part of ways in communication at various moment among countries. It has been widely used in international occasion in various countries because English has become language of instruction in the world (Sofyan,2021). Then English has been a compulsory subject in school from primary up to university level. The purpose of learning English as a second language or foreign language is to make the learners able to communicate effectively (Mohamed, 2018). Basically, language is way to express the idea which is being able to communicate well. There are many new applications to improve English ability that has been offered in the new era revolution 5,0. It is hoped that the learners will be more easily to learn English and enhance the mastery vocabulary from the basic level. Thus, language teaching as a foreign language context should be done interactively

where learning includes two or more interactions, including teacher interaction with students.

Artificial intelligence has been introduced in the aspect of education because of the development and growth rapidly. It proves that this tool is useful and significant to be the media or resources in English language learning. AI is an artificial program based on Artificial intelligence which can stimulate the conversations or chats with other users like humans through messaging, application, websites, mobile applications or by mobile phone. One of the applications is called chatbot that focuses on the language system. According to Zumstein and Hundertmark (2017) a chatbot is a computer system software that uses natural language processing to mimic; human language with the aid of text-based dialogue system. This application includes the mimics human speech namely textual or audio.

One of the most important things that students must have in mastering English is vocabulary. Learning vocabulary for English seems easy but some students struggle to memorize. Students assume that learning English makes they bored

studying in class. In addition, the role of teachers in teaching is also important so that students are interested in learning English. Teachers can tell students to repeat words that are difficult to pronounce making it easier for students to speak English. Because without mastering vocabulary, students will find it difficult to understand the meaning when reading, Listen and express his ideas in communicating. Conversely, if the student has a lot of vocabulary he will find it easy to communicate and understand the opponent of the speaker in English. In addition, in fact, as seen at the target location, when the service team conducts pre-observation in the form of questions and answers, students still have a high enough concern and fear to speak or speak English in front of a crowd. Or in other words, they don't have the courage and self-esteem to speak in front of a crowd. There are several things that cause this, one of which is the lack of vocabulary that they know and master, so they are limited in conveying their ideas and thoughts. The low interest of students in speaking English is also a problem found in the target audience. They shouldn't just be encouraged to learn, but also encouraged to learn to acquire knowledge, as well as promote learning to act. For junior high school students where they are still transitioning from an elementary school environment, teachers must be able to provide varied English teaching and experiences (T. Sari & Nayir, 2020).

A chatbot application is easily accepted by the teachers and students for learning English. It has many benefits and advantages such as personalized feedback, flexible learning paths, and real-world language exchanges. The learners are motivated and trained for involvement and self-directed learning (Kuhail et al, 2023). By using the application of chatbot, it is hoped the students are more interested in learning English and enhancing their vocabulary. Chatbot is an application program that can give responses and stimulate English conversation to get authentic and human like practices.



Chatbot application



In a broad sense, Holmes et al. (2019) defined Chatbots as AI-powered software that can converse with users in a natural language through audio and text forms. This definition is supported by Zemčik (2019), who noted that Chatbots are designed to communicate with users in a manner that resembles real people. With the increased use of the Internet and social media platforms, Chatbots are being utilised in various areas, including customer service, marketing, advertising, entertainment, and technical support.

The utilisation of technology provides numerous opportunities for dialogue and discussion among students in the classroom (Al-Wazzan, 2019). Wegerif (2007) emphasised that students can enhance their dialogue development through the capabilities of Information and Communication Technology (ICT), which enable in-depth discussions. He contended that dialogue promotes higher levels of thinking and enables students to achieve greater levels of Bloom's Taxonomy, moving beyond the traditional Gagné (1985) and Bloom (1956) approaches, and towards a cultural and social view of learning, which prioritizes relationships and interaction between students to understand and accept diverse opinions. Thus, digital dialogue can further enhance the benefits of Chatbots. Chatbots can be regarded as a basic version of dialogue-based teaching systems. For instance, Evens and Michael (2005) identified the Intelligent Learning System (CIRCSIM) as one of the first Dialogue-Based Tutoring Systems (DBTSs) that uses dialogue to assist students in studying in-depth and reinforcing their learning. Additionally, the Auto Tutor System has been developed to simulate an educational dialogue and includes adaptive learning activities that engage students in educational dialogue (Holmes et al., 2019). Watson Tutor is one of the most recent DBTS smart learning systems that have been integrated into a product for higher education curricula to enable students to access a deeper understanding of learning material (Ventura et al., 2018). Chatbots can be used to support learning and

be considered educational chat programs (Holmes et al., 2019). Researchers have also explored possibilities of interactive Chatbots interfaces based on dialogue and mutual interaction between the student and the system, using the natural language of the students, which could increase their motivation to search, question, and accept diverse opinions (Al-Amri, 2019). Chatbots are part of a constructive learning and teaching environment that enables students to acquire twenty-first-century skills, such as digital dialogue (Al-Amri, 2019; P. Bii, 2013). Wegerif and Major (2019) emphasised that technology expands the conversational space between learners, opening a common ground for interaction between different perspectives and leading to new learning and knowledge. It has been suggested that the level of experience may not affect digital skills. According to Al-Mujallad (2011), the experience variable does not affect the amount of digital learning skills by experienced instructors. Mamkegh (2021) confirmed that there are no statistical differences in the degree of experience to which instructors possess digital learning skills.

Additionally, Abdel Wakil and Musharak (2019) have emphasised that Chatbots are specifically designed to perform specific tasks in diverse fields, including education. Consequently, it is possible to improve the performance of Chatbot tasks in serving and developing education in accordance with the required education outcomes, such as enhancing digital dialogue skills. Issa (2020) asserted that the incorporation of AI-based web applications, such as Chatbots, in education can provide learners with a smart adaptive mobile learning environment that is tailored to their individual learning styles. Such adaptive learning systems are designed to be more responsive to learners' unique characteristics and needs. Therefore, an adaptive learning environment entails creating a distinctive learning experience for each learner based on the learner's personality, interests, and performance, by providing appropriate materials to achieve academic progress (Monova-Zheleva, 2005). Empirical evidence has shown that Chatbots can positively impact students' academic performance and interaction, serving as a virtual assistant for teaching (Essel et al., 2022). The potential of Chatbots in education has been extensively researched. The results of Al-Amri's study (2019) showed that the students' use of Chatbots contributed to improving learning outcomes in the achievement test, as the results revealed the effectiveness of Chatbots in developing the cognitive aspects of the science course. Al-Najar and Habib (2021) found a positive effect of using AI Chatbots in an electronic training

environment in developing the cognitive and performance aspects of the skills of using e-learning management systems.

In addition, Slamet et al. (2020) argues that in 21st century learning, one of the important components that teachers must have is the ability to use and create ICT (Information Communication Technology) based learning resources for learning purposes (Vijayalaksmi, 2021). ICT facilities can act as a medium for educators and students in finding meaning in the English language. In this case, a chatbot is one of the options that can be applied to junior high school learners. Chatbot is an artificial program based on Artificial Intelligence (AI) or artificial intelligence, which can simulate conversations or chats with other users like humans through messaging applications, websites, mobile applications, or by phone. By communicating via text with artificial intelligence robots is expected to make students interested in learning English and certainly can increase the vocabulary they have.

Vocabulary is a crucial part for the learners in learning English to increase their ability. AI chatbot affects the impact for the learners improving vocabulary such as synonyms, word meaning and definition in English. By using AI chatbot applications through mobile phone, each learner is motivated to master IT knowledge and technology at the era revolution 5,0. It also helps the learners to assist in acquiring the vocabulary. By using the chatbot application, it gives the benefits for the teacher and students for example enhancing the new words or lexical development, creating the interaction tasks from the chatbot Ai, improving the vocabulary acquisition and English proficiency.

Related to this, the researcher wants to apply the artificial intelligence through chatbot application to the students of the first semester in the class Vocabulary building and pronunciation practice FKIP Universitas HKBP Nommensen Pematangsiantar. It is expected to improve the students' English vocabulary through AI chatbot and the learners can influence the ability in English.

Method

The researcher used qualitative research methods and focuses on the process and results of the research. The researcher employed a descriptive qualitative. The purpose of the qualitative descriptive method is to provide an accurate, factual, and systematic description of a place, as well as the facts and characteristics of a community. The qualitative descriptive method provides techniques for locating, gathering, and evaluating data. Understanding the findings is more important to analysis in qualitative research than calculating the data's outcomes (Moleong, 2009).

According to Sugiyono (2010), Natural environments provide as direct sources of data for qualitative research, with the researcher serving as the main tool and gathering data mostly in the shape of words or images instead of numerical values. the significance of "purpose" to the research and the tendency to analyze the data, and the emphasis on procedure and not merely results or outcomes and the importance of "meaning" to the research.

The researcher chosen the first semester students from English department to find out the effectiveness of artificial intelligence through chatbot in enhancing the English language vocabulary. The subject of the research is taken from the first semester students who learn vocabulary building and pronunciation practice in FKIP Universitas HKBP Nommensen Pematangsiantar. There are 70 students out of 75 from two classes with 2023/2024 academic year. The students have been chosen randomly from two classes because the total number of the students learn and sit with the same subject in English class. The object of research guides the formulation of research questions, the design of the study, and the interpretation of findings. Based on the background above the object of the research is focused on the students' handwriting in writing personal letter. The researcher used a descriptive qualitative research method. The instrument is a questionnaire to gather the data from the students.

In this section, the data was gathered by the researcher through the use of study questionnaire using google. The data is analyzed by using Likert scale to get the effectiveness of the artificial intelligence in enhancing the vocabulary. It measures the attitudes, opinions and perception about the social phenomena. The types of the questions provided in the form of statements namely positive statement which described positive interest and negative questions which described negative interests.

To find out how students felt about chatbots as learning aids, the researchers employed an experimental survey. A 5-point Likert-scale online survey with the following items was created: (1) strongly disagree, (2) disagree, (3) uncertain, (4) agree, and (5) strongly agree. It was based on the chosen questionnaire structure. There was a twenty-item Likert scale in the questionnaire. Usability, linguistic accuracy, assessment and feedback, and strengths were the four main areas. To find out what students thought about

Table 1. Result

No	SD	D	U	A	SA	Mean
1	13	28	17	4	2	3,71
2	30	22	7	4	1	4,18
3	15	32	13	2	2	3,87
4	8	31	20	5	0	3,65
5	10	35	12	7	0	3,75
6	18	38	5	3	0	4,10
7	13	32	14	4	1	3,81
8	14	35	8	5	2	3,84
9	12	38	9	4	1	3,87
10	13	24	19	5	3	3,60
11	16	29	13	4	2	3,82
12	12	32	9	7	4	3,64
13	18	30	14	2	0	4,0
14	22	27	12	3	0	4,0
15	14	33	10	5	2	2,81
16	4	4	9	32	15	3,90
17	16	32	11	4	1	3,90
18	22	34	5	3	0	4,17
19	5	25	13	13	8	3,09
20	19	35	7	5	0	4,0

the accessibility and ease of use of chatbots, five items were devoted to the topic of usability. Five additional items were allocated to the language accuracy dimension in order to gauge the students' opinions regarding the possible application of chatbots for enhancing language the evaluation and feedback dimension (n = 3) looked into how students felt about chatbots' ability to provide real-time feedback. Lastly, an analysis of the top seven chatbot strengths (n = 7) looked at the advantages of chatbots. The purpose of the questions was to find out how the students felt the chatbot helped them with their English language proficiency, how satisfied they were with its features and operation, and whether or not they would recommend using it as a teaching tool for English.

Findings and Discussion

To find out how students felt about chatbots as learning aids, the researchers employed an experimental survey. A 5-point Likert-scale online survey with the following items was created: (1) strongly disagree, (2) disagree, (3) uncertain, (4) agree, and (5) strongly agree. It was based on the chosen questionnaire structure. There was a twenty-item Likert scale in the questionnaire. Usability, linguistics accuracy, assessment and feedback, and strengths were the four main areas. There are 20 statements shares for the learners to answer through chatbot application: (1) Chatbot is easy for the use in learning vocabulary, (2) Chabot is an easy tool of Artificial intelligence technology, (3) Chatbot has a friendly interface, (4) Chatbot application is compatible with different operating systems, (5) Chatbot is easy to comprehend, (6) Chatbot uses words, phrases and vocabulary well, (7) Chatbot demonstrate adequate use of the grammar, (8) Chatbot help increase English

language skills, (9) Chatbot provides the correct language use, (10) Chatbot stimulate the accurate language use, (11) Chatbot allows self-check, (12) Chatbot assist in delivering immediate feedback, (13) Chatbot correct the mistakes immediately, (14) Chatbot is a fun learning tool in English, (15) Chatbot can motivate to learn English, (16) Chatbot can understand the various topics, (17) Chatbot build the confidence, (18) Chatbot is helpful for learning English, (19) Chatbot match preferred learning English, and (20) Chatbot reduces anxiety. The following is the result of the answer from the students.

From the above table we can see that questions number (12) and (18) give many responds from the learner. It means that the students are preferred to choose fun and enjoy for learning English vocabulary. This chatbot motivates and enhances the students to learn new words, meaning, synonyms and understand the lexical of the words in immediate feedback. If we compare to the responds of the students' answer in question number (4), (5), (6), (13), (14), (18), and (20) is zero for the strongly agree.

The data was gathered from Google form on 30 students of the first semester university students at FKIP Universitas HKBP Nommensen Pematangsiantar. There were 20 statements written in the questionnaire for the students form. the effectiveness of chatbot use in English class is a likert scale. The options are strongly agree, agree, don't know, disagree and strongly disagree. Here is the calculation of the score:

$$\text{Final Score} = \frac{SA + A + U + D + SD}{\text{Total Scale Score} \times \text{Total Participant}} \times 100$$

The result is that the students' answer mostly strongly agree with the statement. It means that the students are motivated to learn English by using artificial intelligence chatbot in enhancing vocabulary. They feel easy to use, practical, more effective and efficient, reliable and significant to use the chatbot.

CONCLUSION

After finding the results above that the Artificial Intelligent through chatbot application assists the students in increasing the ability for vocabulary and the material is also interesting in the students' mobile. To teach the students at the era revolution 5,0 forces the teachers to master the ICT (Information communication Technology) as the tool to encourage the students for example the various methods and tools that provided in the internet. It is a medium for the teachers in delivering the materials for the students. The teachers can find the meaning of the words in a wide context through chatbot application. This chatbot application is a virtual robot that can

understand and process user requests, and provide relevant answers appropriately. Even the 'bot' itself can mimic human conversations in the form of text and voice applied to websites and applications such as Facebook, WhatsApp, Twitter, and others. The results of research conducted by Aliv Faizal Muhammad and Farah Adila (2021) revealed that chatbots and testing the level of response accuracy increased if the variety of vocabulary data sets increased. In addition, it is said that this media can be used by language learners to practice English conversation (Muhammad & Adila, 2021). Furthermore, in the study it was also described that students also prefer to do 'silent practice' in reading conversational texts while learning English skills and some just memorize them. Since today's learners are typically digital natives, the nature of student learning has shifted from traditional to digital means through the integration of technology in their silver literacy. This new perspective supports the use of technology in language learning, especially English. By using the chatbot application (AI) in learning the vocabulary, it affects the significant effect for the students at FKIP Universitas HKBP Nommensen Pematangsiantar. The students have an ability to remember and comprehend the new lexical words of the vocabulary from the course. Therefore, this technology carries the best tool to improve and facilitate the vocabulary learning for English learners. The students also motivated and engaged in learning the words definition, meaning, synonym from the chatbot application. The use of the chatbot Artificial Intelligence tool to the students can improve the confident and passion for the for the limited vocabulary. It is also simple and practical for the use because the application can be used anytime as it has been installed in the mobile phone. This application is recommended to the teachers for using chatbot application in learning English vocabulary for the students.

In other words, we can conclude that chatbots can aid the students to find the answers of their questions very quickly and efficiently. It does not have to read the time or get an email because this application response instantly and immediate feedback. It helps the students in improving the English language skills such as practicing vocabulary, listening and reading. Understanding AI tools' advantages, risks, and responsible usage is crucial for EFL teaching and learning. Researchers must address technical and practical issues while aligning them with teaching principles. Teachers should best use these artificial intelligence tools to provide personalized and adaptive learning experiences based on students' needs, preferences, and progress, offering

feedback, direction, scaffolding, and assessment.

Artificial intelligence is a crucial tool that motivates the students to learn English language such as vocabulary. Chatbot is one of the example application for the effectiveness to improve the vocabulary mastery. Most of the students mentioned that chatbot is more effective to improve the vocabulary ability to learn English and they enjoy with the systems, features and tools. The chatbot can be beneficial as a additional media for teaching English then giving challenging to the practice and feedback. There are three important parts in English language namely vocabulary, grammar and pronunciation.

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