Utilizing AI-Based Technology for English Teaching and Learning

Mr.S.Ramesh Raja[1], Mrs.A.Alagumathi[2]

[1,2]Department of English,

[1,2]Assistant Professor, Sri Bharathi Engineering College for Women, Pudukkottai - 622303

[1]rameshraja4687@gmail.com

[2]alagumathia@gmail.com

***Abstract* — Artificial Intelligence (AI) emulates human intelligence through computer-based simulations, functioning akin to human beings. As a key driver of the 4.0 industrial revolution, AI plays a pivotal role in enhancing education, particularly in English Language Teaching (ELT). This library research aims to explore the significance of AI in ELT and investigate its various applications. The findings reveal that AI contributes to creating an optimal learning environment for English acquisition. Its substantial capacity allows for the customization of learning atmospheres, enabling learners to engage multiple senses while honing English skills based on their proficiency levels, vocational requirements, or personal interests.**

AI facilitates real-life simulated dialogues, including spoken English, and enhances practical skills such as written communication. This results in heightened student engagement and optimizes the overall impact of English language instruction in ELT. The evolution of technology and platforms makes learning English more accessible, with AI technology presenting opportunities to refine language skills. A plethora of ELT applications grounded in AI, such as Google Translate, Text to Speech (TTS), English Able, Orai, Elsa, Chatbot, Duolingo, Neo platforms, and others, serve as smart machines capable of simulating human-like intelligence. These technologies offer diverse learning experiences, making it easier for students to comprehend and master the English language.

Keywords— Artificial Intelligence, English Language, Learning, Teaching

I. INTRODUCTION

The industrial era has compelled individuals to adapt swiftly to rapid changes. The advent of globalization and the fourth industrial revolution has ushered in novel forms of creativity, opportunities, and challenges, particularly in the realm of technology. Consequently, technology assumes a crucial role in disseminating information through various mediums such as text, images, and sound, as highlighted by Rahayu and Pujiyono (2017). The primary purpose of technology is to streamline human tasks and activities. Among the technologies undergoing intensive development, Artificial Intelligence (AI) stands out as a noteworthy example.

Artificial Intelligence (AI) stands out as a facet of computational creativity, garnering increased attention for the development of AI technologies (Cheng & Day, 2014). Various AI technologies have been implemented to imbue computers with creativity, as highlighted by Rahman (2009, p. 343). These technologies involve creating software capable of autonomous functions such as knowledge filtering and computational tasks, contributing to areas like student searches.

AI, also known as Machine Intelligence (Mehrotra, 2019), strives to emulate human intelligence in computer systems and robotic devices (Karsenti, 2019). It encompasses the prediction of machine intelligence through the demonstration of natural intelligence exhibited by humans, essentially infusing machines with human-like cognitive abilities. The field of AI, as defined by Mehrotra (2019), explores the analysis and development of smart machines and applications, aiming to make machines think and behave intelligently, akin to human beings.

The term "AI" comprises "artificial" and "intelligence" (Ahmet, 2018). "Artificial" denotes something simulated, not entirely real but not necessarily fraudulent. On the other hand, "intelligence" encompasses various complex attributes such as reasoning, self-knowledge, understanding, emotional awareness, preparation, consciousness, and creativity.

Joshi (2019, p. 4) emphasizes that AI does not necessarily imply creating an incredibly smart computer that can solve all problems; rather, it involves building machines capable of human-like actions. The objective of AI is to develop computer software or hardware systems that exhibit human-like thought processes or display traits traditionally associated with human intelligence (Campesato, 2020). AI, as a theoretical concept, can perform tasks typically involving human intelligence, including speech understanding, language awareness, decision-making, and visual perception.

AI plays a pivotal role in language education, offering tireless and individualized training, providing learners with abundant feedback and scaffolding activities crucial for fluency development. The promise of AI lies in its potential to expedite skill development.

Kaur & Gill (2019) assert that AI represents a digital endeavor to achieve human-level intelligence through various computational processes. It encompasses advanced technologies that enable humans to perceive, comprehend, function, and learn from machines. AI, as a branch of computer science, emphasizes thinking and acting like humans, borrowing human intelligence traits and incorporating them in a computer-friendly manner. Tasks such as learning, planning, decision-making, and language understanding can be performed by AI.

The integration of technology and digital platforms has facilitated English language teaching and learning, offering opportunities for skill enhancement. However, the development of an English class model utilizing AI should complement, rather than replace, traditional teaching methods. Ribeiro (2020) underscores the pragmatic use of AI in English Language Teaching (ELT), especially given the systematic grammatical structure of the English language.

In conclusion, this research seeks to comprehend the role of Artificial Intelligence (AI) and investigate AI technologies in English Language Teaching (ELT), recognizing the potential for transformative impacts on education and language learning processes.

II. METHOD

This constitutes a library-based research endeavor, involving the systematic collection of data or scholarly writings with the specific goal of addressing the research objective or amassing bibliographic information. It is an investigative process conducted to tackle a problem, grounded in a meticulous and comprehensive exploration of pertinent library materials. Notably, one distinguishing feature of library research is the direct engagement of the researcher with textual sources, as articulated by Zed (2004, p. 4). The forthcoming analysis will encompass an exploration of various reference books, journals, and the findings of previous related studies, establishing a theoretical foundation for the subject under investigation.

The data sources utilized in this research encompass books, journals, and internet sites pertinent to the selected topic. The researcher draws upon a diverse range of books and journals related to the research topic to gather comprehensive research data. The method employed for data collection in this analysis is documentation, entailing the search for information within documents, books, articles, papers, posts, newspapers, and other relevant sources. However, in this study, an evaluation of concepts and theories is prioritized, relying on the existing literature, particularly drawing insights from various articles published in reputable scientific journals.

Following the collection of all pertinent data, the subsequent phase involves data analysis to derive meaningful conclusions. Employing content analysis techniques is crucial for ensuring accurate and reliable results in the data analysis process. Content analysis, a form of study involving a thorough scrutiny of the contents of written materials, is chosen because the nature of the data necessitates a descriptive elucidation.

III. FINDINGS AND DISCUSSION

Relationship between Artificial Intelligence and English Language Teaching

AI-assisted devices form a subset within computer-assisted language learning (CALL), particularly in the context of foreign language learning. The field of AI brings forth a plethora of advancements in foreign language education, propelled by the exponential growth in natural language processing and technologies adept at handling vast amounts of data (Li, 2020). English Language Teaching (ELT) holds a crucial position as an educational objective, aiming to enhance students' ability to engage globally (Mukhallafi, 2020). The expansive development of natural language processing and technologies proficient in managing big data has enabled AI to provide a wide array of improvements in the realm of foreign language education.

Teaching English through artificial intelligence (AI) is a dynamic and challenging domain (Zhu, 2017). AI technologies have the potential to make classrooms accessible to individuals of diverse linguistic backgrounds or those with visual or auditory impairments, fostering inclusivity on a global scale (Marr, 2018). As highlighted by Gawate (2019), AI serves as a crucial support system, benefiting both English language students and teachers. This assertion is echoed by Li (2017), who states that "Artificial intelligence also functions as a tool for enhancing English teaching." In the realm of AI, the integration of language literacy and digital literacy proves to be a synergistic approach to enhancing global competence, particularly in English language acquisition. The importance of personalized content remains pivotal in digital learning technology, with adaptive systems leveraging big data and artificial intelligence now readily available.

In the current study, Mukhallafi (2020) defines artificial intelligence (AI) as the utilization of AI systems for enhancing the teaching and learning of English, specifically focusing on improving the organization, arrangement, and selection of instructional content. This approach aims to diversify instructional sources and educational streams based on learners' proficiency levels. Additionally, AI is employed to individualize self-study procedures, simulate intelligent and expert systems, and establish innovative teaching techniques and assessment methods. Wang (2019), in his research titled "Research on Artificial Intelligence Promoting English Learning Change," explores the relationship between Artificial Intelligence and English teaching, elucidating the connection as follows:

1. Artificial intelligence changes the atmosphere in which English is learned. Artificial intelligence offers a good learning atmosphere for immersive English learning. Through integrating and logically interpreting information such as images, sound, and text in an intelligent device, English learning becomes more stereoscopic and visual. Students communicate with AI through the interface between man and computer, which not only improves the validity of language environments. This statement is also supported by (Zilberman, 2019) that AI has a significant ability to create a personalized atmosphere in which adult learners use all their senses to concurrently exercise English skills in conjunction with their present level of English or occupational needs or wishes.
2. Artificial Intelligence optimizes the teaching impact of English. AI will provide a real simulation dialog platform for the teaching and learning of English in English. We will help students make better use of English words, spoken English, and English writing, and develop their comprehension skills. Not only can the cultural and customs awareness of the various English-speaking countries collected in AI be used to communicate and connect with students, but it can also significantly enhance the interest of students in learning English.
3. Artificial Intelligence increases the practical skill of the students in English class. Artificial Intelligence (AI) is currently the hotspot technology material of social science within the industry. The application of science and technology in English Language Teaching (ELT) requires that teachers and students understand the ability to work the system and solve problems in time. Therefore, as AI is applied to English teaching, it increases the practical operational capacity of the students.

According to Gawate (2019) in his article entitled “Artificial Intelligence (AI) Based Instructional Programs in Teaching-Learning of English Language” states that any advantages of AI-based English language teaching and learning instructional programs are:

1. Friendly need-based instructional programs for consumers. The AI-based teaching software combines aim learners and their contextual needs. It is laid down with the learners' clear expectations and exact criteria. English language teaching-learning misleads to no endpoint without analyzing learners' needs.
2. Qualitative contents: through Artificial Intelligence, it is possible to create qualitative teaching-learning material that operates on all levels of language such as hearing, speaking, reading, and writing.
3. Supplementary teacher and student support system. As an external support mechanism, AI plays a critical function for students and teachers of the English language. AI, when it incorporates humanized knowledge, will do this at anytime and anywhere with precise assistance. While AI-based services are built-in, the position of educators is not denied.
4. Fast feedback system: AI-based systems can be built to learn English in a variety of ways to get feedback. It can be used in AI-based instructional programs to quantify and interpret the input according to the needs of the students, such as gradation, review, cross verification, and in-depth presentation. All facets of the students' success are assessed.
5. Changing the teacher's role as a guide and director. It is difficult to change the position of the instructor as a guide and director and exclude the teacher from the method. AI-based systems only modify the teacher's role in the ELT process. Students should be led and assisted by teachers. The teacher can handle and manage such an AI-based program that needs a few manual modifications, and teachers can do it. AI-related instructional services can only be an aid in teaching-learning of the English language.
6. Connectivity globally. For some AI-related instructional systems, it gives students all the possibilities. Owing to Artificial Intelligence, spatial and time constraints are solved. It is possible to exchange knowledge from quality organizations as well as from organizations. This is truly incredible access to AI-based instructional software. With the help of facial recognition, voice recognition, and movements of the students, it allows remote access. In short, all student behaviors can be managed with AI-based applications.
7. Teaching-learning personalization in English. As per the demand and needs of the students, the course can be created. It can be student-centered in its personalization.
8. The AI-based learning platform helps learners to learn at their speed, to repeat topics, and to highlight items that they have issues with to involve them with activities, to cater to their interests, etc. For the advancement of teaching-learning English, AI-based instructional programs are tailored. It emphasizes the need-based creation of the English course material.

Artificial Intelligence Technology in English Language Learning

Artificial intelligence technology is a technology that explores how the robot can complete the intelligent work that only human beings can complete initially as one of the world's most advanced information systems (Han, 2019). Technology also develops in such a way that it becomes more advanced and makes it easier for us to do some work, such as teaching and learning English. One technology that is often discussed in the wider community is artificial intelligence technology. Technology is opening up many new possibilities for language learning (Fryer & Carpenter, 2006).

Luo & Cheng (2020) states that teaching foreign languages is powered by Artificial Intelligence (AI) technologies. The challenges of short teaching hours, limited space, limited resources, and a monotonous measurement method can be solved efficiently by Artificial Intelligence (AI) technology, etc. Thornton (2007, p. 1) defines that almost all programs/technologies Artificial Intelligence (AI) can be said to be doing some form of problem-solving. It means that Artificial Intelligence (AI) is a broad area of science that incorporates this dynamic problem-solving and human-like capacity to sense behavior and purpose. (Cobar, 2019).

The goal of AI can create smart machines that think and act like humans, with the abilityto simulate intelligence and produce decisions through a process in a similar manner to humanreasoning (Salvaris et al., 2018, pp. 3–4). AI works by combining the presence of several data, repetitive processing, and intelligent algorithms. This allows the software to learn automatically from the patterns or features that exist in the data. AI is a very broad field of study. The scope of theories, methods, technologies, and sub-fields that exist in AI is varied including machine learning, neural networks, cognitive computing, computer vision, and scientific language processing. When humans communicate with others by using a language, they may employ, almost effortlessly or extremely complex and still little understood process (Nilsson, 2014). Thus a computer system capable of producing and interpreting fragments of the English language has been very difficult to create. One cause of the challenge is that language has arisen within intelligent beings as a means of communication.

Teaching and learning English has become easier with the development of digital platforms. Artificial intelligence (AI) technology now offers the opportunity to improve English language skills. Language literacy and digital literacy are a neat combination to improve global competence. AI bases its process on the text processing of a language. The more sophisticated the AI, the more and more accurate the language he mastered. Therefore, the use of AI technologies would strengthen foreign language teaching and learning. (Yingsoon, 2021).

AI plays a role in conveying various information and also helps in making the English learning process even more effective. The existence of various kinds of learning technology makes it easier for these learners to understand what has been explained by the teacher. Even students also have the ease of learning even without having to face the teachers directly. There are so many choices of language learning applications based on the technology of Artificial Intelligence (AI) which can be used by both English educators and students/learners. Some examples of AI technology that can be used in English language learning are as follow:

1. Google Translate

Google has created an enormous suite of tools for users, but after their original search engine, possibly the most important application is Google Translate which can be accessed on http.google.com/translate (Smallwood, 2015, p. 51). Text speech has even been replaced by a translator. Applications like Google Translate are

already integrated with Google Board. So translating Indonesian to English, or vice versa is as easy as typing on a keyboard. Covili (2016) states that there are five things about Google Translate, they are: Google Translate can translate into up to 50 different languages. The users can translate entire documents using Google Translate. Google Translate can pronounce words in the new language and provide definitions of the words. By using the mobile app for „translate", the users can translate street signs on the fly. Google Translate also can translate websites into a variety of languages.

Concerning teaching and learning English, Google Translate as a translator is the main function, namely as an online translator. Students can use it to translate words/phrases/sentences/paragraphs from Indonesian English or Indonesian English which are used a lot in Indonesian English translation activities. Google Translate can be used to check the spelling of words that arise due to typos. It is very useful when it comes to checking the English spelling. Google Translate can be used as a tool to learn foreign language word pronunciation. For students who want to learn English for free, especially how to pronounce words, google translate can be used.

2. Text to speech (TTS)

Google Translate adds text to speech as an additional feature. The text to speech feature of Google Translate provides various languages to be spoken, from words that are translated from various languages such as English. The text to speech feature in Google Translate can read text with a less flat intonation and is smoother than the others. A Text- To-Speech (TTS) system can be defined as a system that can convert text into speech automatically through phonetization (the arrangement of phonemes to form speech). A TTS system can pronounce any word because the vocabulary is unlimited.

Concerning teaching and learning English, Text-To-Speech (TTS), can convert computer-generated text into pronunciation (audio), where the resulting pronunciation can be adjusted for speed, intonation, and the output audio format to be saved in the form of an audio file. TTS technology can streamline the teaching and learning process and complement the learning media for English subjects, especially in the English laboratory (Yudhistiro, 2016).

3. English Able

English ABLE is an Assessment-Based Learning Environment for English grammar. This technology was developed by Zapata-Rivera et al (2007). Assessment-based learning environments (ABLE) use assessment knowledge to direct instruction from a variety of sources (e.g. formative and summative). Concerning teaching and learning English, English ABLE refers to a learning environment that focused on tests to help English language learners (ELLs) learn about grammar in English. English ABLE uses a TOEFL CBT job library to build new sets with improved assignments aimed at unique ELL component skills. An adaptive, scaffolded learning environment, also offers packages for learners to help students master facets of English grammar.

4. Orai

Orai's perfect option for public speaking. It can not only be used to support a teacher but can also be used as a teacher. Orai is getting excellent reviews and is enjoyable to use. Orai is user-friendly. Improving your oratory skills is a quick, self-directed strategy. Concerning teaching and learning English, Orai's strengths are being able to detect how many words we say to detect how many fillers we say while we speak. Using Orai in class, the teachers can combine it with English speaking subject matter at that time, such as describing people, then give students about 15 minutes to use Orai and after that choose randomly to come forward to practice speaking immediately. Orai provides several features designed to hone students' speaking skills, namely Lessons, Practice, Progress, and Recordings. Each of the main features has interesting content and can be studied repeatedly to hone these speaking skills. In the 'Lessons' feature, those who want to practice speaking can learn and practice their speaking skills on the content provided. Each content consists of three content stages that must be completed before you can learn the next lesson content. Orai is an application purposed to help students to be better English speakers (Suryani et al., 2019).

5. Elsa

English Learning Speech Assitant (ELSA) and designed by Vu Van in 2015, and is based in San Francisco, United States. This application makes use of Artificial Intelligence (AI) and speech recognition to help improve and perfect English pronunciation. ELSA (English Learning Speech Assistant) Speak is an application for learning English that applies artificial intelligence and speech recognition. This technology allows for a two-way learning process, for example, the users can pronounce certain words or sentences, then the system will perform analysis and provide corrective input. The ELSA framework is trained to use voice data of people speaking English with multiple accents, to recognize the speech patterns of non-native speakers, distinguishing them from most other speech recognition technologies. Users are given an assessment test to determine their level of proficiency. ELSA provides scores ranging from zero to 100, with most native speakers scoring 95 or above. The results help ELSA personalize the user's learning path, highlighting which sounds hit the spot, and what else needs tweaking. ELSA makes suggestions for specific lessons according to the user's abilities. Concerning teaching and learning English, Application ELSA (English Learning Speech Assistant) Speak is an application for learning English that applies artificial intelligence and speech recognition to help students improve their English speaking skills. This technology allows for a two-way learning process, for example, users can pronounce certain English words or sentences, then the system will perform analysis and provide corrective input (Eka, 2020).

6. Chatbot

Chatbots as one of the artificially intelligent conversational systems are the latest technologies designed to communicate both with humans and computers automatically (Nghi et al., 2019). Several previous studies have proven the use of chatbots as a

learning medium, especially learning English (Afrianto et al., 2019).

Concerning teaching and learning English, the Chatbot application that is built will act as an English conversation partner. Conversations, in general, can be carried out orally or in writing so that it should be possible for the user to be able to practice both. To support the purpose of the chatbot application as a medium for English conversation training, a grammar error correction feature and a user's daily log feature are needed. The responses obtained included the location of the errors, suggestions for replacing words/sentences, and descriptions of errors. This is an effort to minimize errors in the user's sentence structure. Then the daily log feature is useful for measuring the extent to which the user's practice progresses in conversation mastery and English sentence structure. That way, users not only familiarize themselves with conversational English, but also get corrections and assessments of their practice. The simple chatbot function starts with the message the user sends. The NLP (Natural Language Processing) and chatbot then interpreted the message by referring to the message according to the current database (Haristiani, 2019).

7. Duolingo

Duolingo is a web that is used to learn foreign languages. Duolingo is a language learning application that uses a game method by matching words and filling in the blank parts of sentences. This method aims to teach the grammar, words, and phrases needed in a sentence. Concerning teaching and learning English, Any student at any level of English can learn a new science with Duolingo. So that the learning materials obtained by users match their abilities, Duolingo conducts tests first. After taking the test, Duolingo users will know what level of English they are at. Only then will Duolingo provide English material that has been adapted to the user's abilities. Not only about grammar, but Duolingo is also equipped with learning vocabulary, terms, and so on. Duolingo's English teaching method is also designed to be gaming-like and "competitive" with other users. That way, users of this application can see the development of English language skills that have been learned so far.

8. Neo

Nexgen English Online Co., an English application company from California, United States, launched the neo application, a global English language learning system. Neo is an integrated learning solution via cellphone to gain proficiency in English that can adapt to the development of user learning through artificial intelligence and voice recognition systems. Nexgen Neo is a new solution to learning English. Neo is an application that is effective, flexible, and easy to operate for users who have an active lifestyle. With an easy-to-use interface, an adaptive learning system using international standard English technology and certificates, Neo also presents a different experience for each user. Artificial intelligence (AI) in the neo Study application regularly analyzes user behavior and data to then provide content that automatically adapts as users progress.

Concerning teaching and learning English, Neo helps users master English faster as if they were accompanied by an expert personal teacher. Through the neo Study application, users will use the advanced speech recognition feature which trains them to correct the pronunciation of each word until they become proficient in speaking English.

The benefits of using AI tools in English language learning are: 1) AI can do things that cannot be achieved by individuals, such as evaluating English down to the phoneme and understanding how your language skills have progressed almost immediately over time. 2) At any moment, wherever they are genuinely accessible (sometimes even without the internet). 3) AI tools for learning spoken English are a more accessible and successful alternative. 4) They are more scalable and can serve a lot more students than people do. 5) They can accelerate learning by an increased level of instruction, with human teachers alone becoming difficult with such frequency. 6) For those who lack trust in their speech capacity, AI instruments have a pressure-free learning environment.

III. CONCLUSION

Artificial intelligence endeavors to create robots endowed with intelligence comparable to, or even surpassing, human intelligence. The expectations for artificial intelligence encompass a broad spectrum of capabilities designed to simplify tasks for humans, including natural language processing, perception, reasoning, movement, object manipulation, knowledge acquisition, and learning. The ultimate goal of developing such advanced machines is to enhance efficiency by reducing the time required for various activities. Through the utilization of artificial intelligence, decision-making becomes more cost-effective, contributing to overall efficiency.

The evolution of digital platforms has facilitated the process of learning English. The integration of computer and cell phone technologies not only expands opportunities for people worldwide but also amplifies the incorporation of artificial intelligence in language learning. Personalized content emerges as a pivotal aspect of digital learning technology, with the availability of adaptive systems leveraging big data and artificial intelligence. This enables tailoring the approach to learning English based on the unique needs and schedules of individual users.

IV.REFERENCES

1.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.

2.Ahmet, C. (2018). Artificial Intelligence: How Advance Machine Learning Will Shape The Future Of Our World. Shockwave Publishing via Publish Drive.

3.Campesato, O. (2020). Artificial Intelligence, Machine Learning, and Deep Learning. Stylus Publishing, LLC.

4.Cheng, S.-M., & Day, M.-Y. (2014). Technologies and Applications of Artificial Intelligence: 19th International Conference, TAAI 2014, Taipei, Taiwan, November 21-23, 2014, Proceedings. Springer.

5.Cobar, J. (2019). Artificial Intelligence: Data Analytics and Robot Learning in Practice and Theory. Self Publisher.

6.Covili, J. J. (2016). Going Google: Powerful Tools for 21st Century Learning. Corwin Press. Devi, K. G., Rath, M., & Linh, N. T. D. (2020). Artificial Intelligence Trends for Data Analytics Using achine Learning and Deep Learning Approaches. CRC Press.

7.Eka, I. (2020, February 20). Aplikasi ELSA Speak Ekspansi ke Indonesia, Fokus Tingkatkan Kemampuan Berbicara Bahasa Inggris. Dailysocial. https://dailysocial.id/post/elsa- aplikasi-belajar-bicara-bahasa-inggris

8.Fryer, L., & Carpenter, R. (2006). Bots as Language Learning Tools. Language Learning & Technology, 7.

9.Gawate, S. (2019). Artificial Intelligence (AI) Based Instructional Programs in Teaching- Learning of English Language. https://doi.org/10.33329/ijelr.64.69

10. Gawate, S. P. (2019). Artificial Intelligence (AI) Based Instructional Programs in Teaching- Learning of English Language. International Journal of English Language, Literature and Translation Studies (IJELR), 6, 6.

11.Han, B. (2019). Application of Artificial Intelligence in Autonomous English Learning among College Students. International Journal of Emerging Technologies in Learning (IJET), 14(06), 63–74. https://online-journals.org/index.php/i-jet/article/view/10157

12.Haristiani, N. (2019). Artificial Intelligence (AI) Chatbot as Language Learning Medium: An inquiry. Journal of Physics: Conference Series, 1387, 012020. https://doi.org/10.1088/1742-6596/1387/1/012020

13.Joshi, A. V. (2019). Machine Learning and Artificial Intelligence. Springer Nature.

14.Karsenti, T. (2019). Artificial intelligence in education: The urgent need to prepare teachers for tomorrow‟s schools. Formation et Profession, 27(1), 105. https://doi.org/10.18162/fp.2019.a166

15.Kaur, D. J., & Gill, N. S. (2019). Artificial Intelligence and Deep Learning for Decision Makers: A Growth Hacker's Guide to Cutting Edge Technologies. BPB Publications.

16.Li, R. (2020). Using Artificial Intelligence in Learning English as a Foreign Language: An Examination of IELTS LIULISHUO as an Online Platform. Journal of Higher Education Research, 1. https://doi.org/10.32629/jher.v1i2.178

17.Luo, M., & Cheng, L. (2020). Exploration of Interactive Foreign Language Teaching Mode Based on Artificial Intelligence. 2020 International Conference on Computer Vision, Image and DeepLearning (CVIDL), 285–290. https://doi.org/10.1109/CVIDL51233.2020.00-84

18.Marr, B. (2018, July 25). How Is AI Used In Education—Real World Examples Of Today AndA PeekIntoTheFuture.Forbes. https://www.forbes.com/sites/bernardmarr/2018/07/25/how-is-ai-used-in-education- real-world-examples-of-today-and-a-peek-into-the-future/

19.Mehrotra, D. D. (2019). BASICS OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING. Notion Press.

20.Mukhallafi, T. R. A. (2020). Using Artificial Intelligence for Developing English Language Teaching/Learning: An Analytical Study from University Students‟ Perspective. International Journal of English Linguistics, 10(6), 40. https://doi.org/10.5539/ijel.v10n6p40

21.Nghi, T. T., Phuc, T. H., & Thang, N. T. (2019). Applying Ai Chatbot For Teaching A Foreign Language: An Empirical Research. 8(12), 6.

22.Nilsson, N. J. (2014). Principles of Artificial Intelligence. Morgan Kaufmann.

23.Rahayu, S., & Pujiyono, W. (2017). Media Pembelajaran Kecerdasan Buatan Pokok Bahasan Metode Pelacakan Menggunakan Multimedia Pada E-Learning.JSTIE (Jurnal SarjanaTeknikInformatika)(E-Journal),5(1),136–145. https://doi.org/10.12928/jstie.v5i1.10824

24.Rahman, S., Mahbubur. (2009). Methods and Applications for Advancing Distance Education Technologies: International Issues and Solutions: International Issues and Solutions. IGI Global.

25.Ribeiro, R. (2020, March 9). Artificial Intelligence in English language learning. Cambridge.Org.https://www.cambridge.org//elt/blog/2020/03/09/artificial- intelligence-english-language-learning/

26.Salvaris, M., Dean, D., & Tok, W. H. (2018). Deep Learning with Azure: Building and Deploying Artificial Intelligence Solutions on the Microsoft AI Platform. Apress.

27.Shin, M.-H. (2018). How to use artificial intelligence in the English language learning classroom. Indian Journal of Public Health Research & Development, 9(9), 557. https://doi.org/10.5958/0976-5506.2018.01058.6

28.Smallwood, C. (2015). The Complete Guide to Using Google in Libraries: Research, User Applications, and Networking. Rowman & Littlefield.

29.Sridhar, G. S. (2018). Artificial Intelligence: The Future Way of Technology. G.S.SRIDHAR. Suryani, L., Syahrizal, T., & Fauziah, U. N. E. (2019). Using Orai Application in Teaching Pronunciation. Indonesian EFL Journal, 5(2), 93–102. https://journal.uniku.ac.id/index.php/IEFLJ/article/view/1835 Thornton, C. (2007). Artificial Intelligence. New Age International. Wang, R. (2019). Research on Artificial Intelligence Promoting English Learning Change. Proceedings of the 3rd International Conference on Economics and Management, Education, Humanities and Social Sciences (EMEHSS 2019). Proceedings of the 3rd International Conference on Economics and Management, Education, Humanities and Social Sciences (EMEHSS 2019), Suzhou City, China. https://doi.org/10.2991/emehss-19.2019.79

30.Whitby, B. (2009). Artificial Intelligence. The Rosen Publishing Group, Inc.

31.Yingsoon, G. Y. (2021). Using AI Technology to Support Speaking Skill Development for the Teaching of Chinese as a Foreign Language [Chapter]. Multidisciplinary Functions ofBlockchain Technology in AI and IoT Applications; IGI Global. https://doi.org/10.4018/978-1-7998-5876-8.ch010

32.Yudhistiro, K. (2016). Pemanfaatan Teknologi Text-To-Speech Sebagai Media Pembelajaran Pada Laboratorium Bahasa Inggris. Jurnal Teknologi Dan Manajemen Informatika, 2(1), Article 1. https://doi.org/10.26905/jtmi.v2i1.622

33.Zapata-Rivera, D., Vanwinkle, W., Shute, V., Underwood, J. S., & Bauer, M. (2007). English ABLE. Proceedings of the 2007 Conference on Artificial Intelligence in Education: Building Technology Rich Learning Contexts That Work, 323–330.

34.Zed, M. (2004). Metode Penelitian Kepustakaan. Yayasan Obor Indonesia.

35.Zhu, D. (2017). Analysis of the Application of Artificial Intelligence in College English Teaching. Proceedings of the 2017 2nd International Conference on Control, Automation and Artificial Intelligence (CAAI 2017). 2017 2nd International Conference on Control, Automation and Artificial Intelligence (CAAI 2017), Sanya, China. https://doi.org/10.2991/caai-17.2017.52

36.Zilberman, A. (2019, December 31). AI And Learning: The Latest Learning Methodology. ELearning Industry https://elearningindustry.com/artificial-intelligence-best-tool-learning-english.