Benefits and Challenges in Implementing Artificial Intelligence in Education (AIED) in ESL Classroom: A Systematic Review (2019-2022)

Nor Syazliana Sharifuddin & Harwati Hashim

Universiti Kebangsaan Malaysia, Faculty of Education, 43600, Bangi, Selangor, Malaysia.
Email: p117025@siswa.ukm.edu.my, harwati@ukm.edu.my (Corresponding Author)

Abstract
Artificial Intelligence (AI) has gained significant attention in recent years, permeating various sectors and transforming the way tasks are performed. In the field of education, AI has the potential to revolutionize traditional teaching and learning methodologies, particularly in the context of English as a Second Language (ESL) classrooms. This systematic literature review aims to provide a comprehensive overview of the current state of research on the implementation, challenges, and impacts of AI in ESL classrooms based on different countries. For this purpose, a systematic review has been carried out in ERIC, WOS and Scopus databases. After applying the inclusion and exclusion criteria, the sample was set at 25 articles. The findings reveal that AI technologies offer promising opportunities to enhance ESL instruction. Despite the potential benefits, the review also uncovers several challenges and limitations associated with AI implementation in ESL classrooms. Furthermore, the review identifies the need for further empirical research to measure the long-term effects of AI. In conclusion, this systematic literature review provides valuable insights into the current landscape of AI implementation in ESL classrooms. It highlights the potential of AI technologies to enhance language instruction, while acknowledging the challenges that need to be addressed. The findings of this review can guide educators, policymakers, and researchers in making informed decisions about the integration of AI in ESL classrooms, fostering effective and inclusive language learning environments in the digital era besides to require further research and analysis on AI in Malaysian ESL classroom context.
Keywords: Artificial Intelligence, ESL Classroom, Challenges of AI, Benefits of AI, AIEd

Introduction
Ever since the outbreak of Covid-19 prevailed the emergence of hundreds of applications widely used in ESL classroom. Those applications are used to substitute traditional teaching method in order to survive the outbreak so that the students were able to learn even via online learning. This has proven how technology can be a powerful tool to initiate and enhance

teaching and learning in ESL classroom (Pazilah et al., 2019). If there is one positive outcome from the Covid-19 pandemic in 2020, it is the intervention to the education world to prioritise the incorporation of technology in the teaching and learning process (Siti Saleha, Dg. Syuhada and Melor, 2022).

The results of many studies show that the use of Artificial Intelligence has grown throughout the COVID-19 pandemic, and by analyzing the data gathered during the study are able to demonstrate that tools and systems powered by Artificial Intelligence have become more popular among all parties involved in the educational process (Pantelimon et al., 2021).No one can afford to halt the digital transformation of the educational industry or the wave of change caused by machine learning (Ja'ashan, 2020). As a result, smart phone technology, MALL, CALL, and Artificial Intelligence (AI) to aid learning have advanced rapidly (Haristiani, 2019). Along with the resurrection of technology in education, Artificial Intelligence in Education (AIEd) started taking place and emerge as a new popular education trend nowadays. It is not something new and was discovered in the 1940s and has subsequently evolved to meet human needs. The rapid growth of computing technologies has made AIED applications easier to implement and can benefit both teachers and students (Kim et al., 2020).

The use of AI technologies or application programmes in educational settings to facilitate teaching, learning, or decision making is referred to as AIED. Computer systems can provide personalised guidance, supports, or feedback to pupils, as well as supporting teachers or policymakers, with the help of AI technologies, which replicate human intelligence to make inferences, judgements, or predictions (Gwo-Jen Hwang et al., 2020). Based on the results of a study by Syzdykbayeva et al. (2021) revealed that the use of Artificial Intelligence has grown throughout the COVID-19 pandemic, and by analysing the data gathered during the study proven that tools and systems powered by Artificial Intelligence have become more popular among all parties involved in the educational process. Nonetheless, educators are at the crossroads about its functions and uses, and are more concern about either it can bring more harms or advantages to the students (Wong et al., 2020). Therefore, it is importance to enlighten the teachers and students about the powerful tools initiated by the AI and some of them have even been used by them during the pandemic outbreak learning session besides AI can help to reduce teachers' workload (Dai & Zheng, 2019). Artificial Intelligence possesses remarkable functions to help with human lives, which include education field (Wen, 2021).

Since its existence in early 1940s, Artificial Intelligence undergone rapid growth (Mesco, 2019) and now it also includes voice recognition, expert system, machine vision and Natural Language Processing (NLP). Thus, it requires teachers to have a good foundation in AI in order to implement the applications in the ESL classroom. This is supported by research by Brummelen & Lin (2020) showed that K–12 instructors require more scaffolding in AI tools and curriculum to promote ethical and data-related debates and to prioritize supports for learner evaluation and engagement, peer–to–peer cooperation, and critical reflection. The incorporation of AI in education provides promise and represents a ray of light in educational growth (Xu & Ieva, 2021). Artificial Intelligence development in education keep progressing tremendously as a huge potential to assist both educators and students in the teaching and learning process (Siswa, 2020). With the advancement of AI, they can do wonders starting from the simplest task such as autocorrect to the complex tasks such as smart assistance. Back then, the traditional ESL classroom teaching and learning requires teachers to have arduous

tasks to prepare all the teaching materials but the existence of AI bring a new paradigm towards 21st century learning where students are more motivated (Ali, 2020) and teachers can have a better teaching and learning environment.

Contradict to its benefits, according to (Siti Saleha, Dg. Syuhada and Melor, 2022) despite the fact that AI is becoming more ubiquitous in ESL instruction, many teachers and educators still have misconceptions about it. They consider AI to be only tied to robots or machines, despite the fact that AI is present in many facets of our lives. Romero-Rodrguez et al. (2019) observed that "this technology of AI is already being introduced in the field of higher education, although many teachers are unaware of its scope and, most importantly, of what it consists of. As the teachers' role shifted to be a facilitator of learning in the classroom, the student's role shifted towards active learners and 21st century learning should open up for active collaboration among students as they take responsibility towards their learning (Sariani, Khairat & Yaningsih, 2021). With AI, there are hundreds of applications that can be used to facilitate learning (Reiss, 2021), however teachers must have the courage and mitigate the misconception on AI besides to maintain the ethics in using AI in education. Apart from that, Artificial Intelligence applications have been used to investigate students' ideas and contents (Lee, 2021), collaborative interactions (Jarvel an et al., 2020), and emotions (Zhu et al., 2019). In addition to that, recent advancements have focused on the application of AI in education to simplify classroom administration and boost teaching productivity (Keerthiwansha, 2018) and this can reduce the teachers' tasks as the teachers are required to cater to all language needs of the students while keeping constant records on their development, drawbacks and attendance.

Incorporating Artificial Intelligence technology into the online teaching platform can enhance instructional resources, create a positive learning environment for teachers and students, and increase learning effectiveness (Pan, 2020; Kashive et al., 2020). Since Artificial Intelligence is the most current trend, there have been few researches have been done on the aspects of its benefits and drawbacks, challenges, uses of AI in education especially AI in the ESL classroom. Hence, this systematic literature review paper will try to explore the aspects of AI that has been explored by the researchers from different countries to map the research gap about AI in the ESL classroom. This is to help

RQ 1 : What are the benefits of implementing AI in the ESL classroom?
RQ 2 : What are the challenges of implementing AI in the ESL classroom?

Integration of Artificial Intelligence in Education (AIEd)
Artificial Intelligence (AI) has the potential to revolutionize education by transforming various aspects of teaching and learning. There are some ways in which AI is being utilized in education. The first uses of AI in education are for the personalised learning. AI-powered platforms can adapt to individual student needs, providing personalized learning experiences. By analyzing student data and performance, AI systems can identify knowledge gaps, recommend suitable learning materials, and offer customized feedback, enabling students to learn at their own pace and focus on areas that require improvement. This function can help to ease teacher's burden as well to provide instant feedback about their students' needs and they can let their students to take in charge of their own learning.

Apart from that, it provides Intelligent Tutoring Systems (ITS) where AI can act as a virtual tutor, providing immediate and personalized feedback to students (Chrysafiadi & Virvou, 2021). Intelligent tutoring systems can stimulate human interactions, assess student understanding, and offer explanations and guidance. These systems adapt their instruction based on individual student responses, helping learners grasp complex concepts effectively. Artificial Intelligence is also capable in analysing vast amounts of educational data, including student performance, engagement, and behavior (Omar et al., 2021; Al Ghamdi, 2022). This data analysis can provide valuable insights into student learning patterns, identify areas for intervention, and help educators make data-driven decisions to improve teaching strategies and curriculum design. In addition to that, it can also help in automated grading and assessment. AI can automate grading processes for assignments, quizzes, and exams (Hurt et al., 2020). By using machine learning algorithms, AI systems can assess and provide feedback on student work, saving time for educators and offering immediate feedback to learners. This enables teachers to focus more on personalized instruction and supports timely feedback for student growth such as suggesting corrections and identifying learners' mistakes (Bhatt & Muduli, 2021).

The famous Virtual Assistants and Chatbots are commonly being used not only in education but also in another field. AI-powered virtual assistants can assist students and teachers by answering questions, providing information, and offering guidance and also alerts about deadlines (Shekhar et al., 2020). Chatbots can engage in natural language conversations and provide immediate responses, making learning resources more accessible and enabling students to seek assistance whenever needed (Suta et al., 2020). AI can also help in content creation and recommendation (Haristiani, 2019). AI can generate educational content, such as quizzes, exercises, and practice materials. AI algorithms can analyse student performance data and recommend appropriate learning resources, helping students access relevant and engaging content aligned with their learning goals (Haristiani, 2019). Language Learning and Translation is another uses of AI that can be very helpful for weak learners to learn the language especially English for L2 learners. AI language models can facilitate language learning by providing speech recognition, pronunciation feedback, and language translation services (Winata et al., 2019). These AI systems assist learners in improving their language skills, practicing pronunciation, and understanding foreign languages more effectively.

While AI holds great promise for education, it is important to address potential challenges and ethical considerations. Ensuring data privacy, addressing algorithmic bias, and maintaining a balance between human interaction and AI assistance are essential for responsible AI integration in education. By harnessing the power of AI in education, we can create more personalized, adaptive, and inclusive learning environments that benefit both students and educators.

Artificial Intelligence in ESL Classroom
English teaching and learning can be classified into numerous forms, including English as a foreign language (EFL), English as a lingua franca (ELF), and English as a second language (ESL) and ESL being a phrase that is commonly used in Malaysian education. The Malaysian ESL classroom consists of students with different level of proficiencies and it is rather difficult to design the lesson that can actually fit and cater to all their language needs.

There have been many issues, challenges and barriers when it comes to their proficiency levels as each skill comes with its own problem. For example, for writing skill low proficiency level students are unable to construct correct order of Subject Verb Object (SVO) sentences, issues with the usage of tenses, inability to use derivational suffixes properly (Keerthiwansha, 2018). As for the reading, students are unable to read with correct pronunciations and they have problem with the correct use of grammar too. As for the speaking and listening skill, most students have difficulties in maintaining the conversation and they failed to master the technique of active listening due to insufficient vocabularies (Putri, Amri & Ahmad, 2020). Students have trouble speaking owing to a lack of vocabulary knowledge, problems pronouncing words, confusion over word order, fear of making mistakes, and other reasons including teaching tactics, curriculum, and environment, with teaching strategies being the main cause of problems (Putri, Amri & Ahmad, 2020). Hence, Artificial Intelligence can be seen as a new solution that can cater for the problems.

Artificial Intelligence for language teaching was first proposed in the 1970s (Weischedel, 1978). As the early systems were designed as such to detect objective errors, such as grammar and spelling and AI keep upgrading into modern system that are not only able to detect errors but can suggest corrections (Yuan & Briscoe, 2016). One of the examples for this 'intelligence' is Grammarly. The post-pandemic of Covid-19 has caused the blooming of usage by both teachers and students. Artificial Intelligence functions does only able to detect errors and spelling which is very appropriate to be used in the ESL classroom (John & Woll, 2020) but it also works beyond that. Aside from the spelling, grammar, and style checkers are included into word processing software, tools have evolved that go beyond the basics of pointing out more basic problems in composition and provide further help to students on improving their writing (Mike &Perkins, 2023). The emergence of AI software and applications that can fit into ESL classroom gives us the overview of the function of AI in ESL teaching and learning, the benefits and drawbacks of AI and example of tools that are commonly used by the students and teachers for ESL classroom. The deep integration of Artificial Intelligence technology in education improves the quality and effectiveness of foreign language teaching such as in ESL or EFL classroom (Yanzhua, 2020).

There are a few ways of how Artificial Intelligence can be applied in ESL classroom. The foremost way is through AI-Powered Language Learning Platform. It is a platform that supports ESL students in their language acquisition journey (Pikhart, 2020). The platform utilizes AI algorithms and natural language processing capabilities to provide personalized learning experiences. It can benefits students in a few ways such as for personalized learning paths. The AI system assesses students' language proficiency levels through initial assessments and ongoing performance tracking (Nazari et al., 2021). Based on the analysis of their strengths and weaknesses, the platform generates personalized learning paths for each student, highlighting the areas that require improvement. Apart from that, AI application can be implemented in ESL classroom to help teachers to reduce their workload and able to help teachers in grading their students efficiently (Reiss, 2021). AI applications such as Automatic Writing Evaluation (AWE) can help students with their writing problems. Through formative feedback and assessment, AI-powered writing tools could be an effective tool for non-native postgraduate students in English academic writing to increase learning behavior and attitudinal technology adoption (Nazari et al., 2021).

Besides that, it is also can be helpful for adaptive content and exercises. The platform offers a wide range of interactive exercises, quizzes, and multimedia content tailored to individual

students' needs. AI algorithms analyse students' responses and adapt the difficulty level or content based on their performance (Lee et al.,2020). This ensures that students are challenged at an appropriate level and receive targeted practice in areas where they need more support. As much as AI can mimic human intelligence, it is also can provide intelligent feedback and correction. As students engage in language exercises, the AI system provides immediate feedback on their responses (Chiu,2021). It corrects grammar, vocabulary, and pronunciation errors, offering explanations and suggestions for improvement. The system can also track persistent errors and provide specific guidance to help students overcome recurring challenges besides to help teachers in identifying errors with minimal time (Vittorini et al.,2020). Apart from that, the platform includes an AI chatbot or virtual language assistant that engages students in simulated conversations besides enhancing their cultural content (Mageira et al.,2022). The chatbot prompts students with questions, responds to their answers, and provides feedback on their spoken language skills. Through natural language processing, the AI system recognizes and evaluates students' speech patterns, pronunciation, and fluency, offering guidance for improvement.

The AI-powered platform continuously tracks and analyzes students' progress, providing real-time insights to both students and teachers (Majid, 2022). It generates comprehensive reports on students' performance, highlighting areas of improvement and tracking their language development over time. This data assists teachers in providing targeted support and designing personalized instruction. By integrating AI such as using Augmented Reality (AR) into the ESL classroom through a language learning platform and providing real life scenario, students benefit from personalized instruction, immediate feedback, targeted practice, and engaging conversational experiences (Yuh-Shihng Chang et al.,2020). The AI system supports students' language acquisition process, enabling them to progress at their own pace, receive individualized attention, and develop their English language skills effectively besides giving them immediate feedbacks (Chiu, 2021). Additionally, the AI platform frees up teachers' time, allowing them to focus on providing guidance, facilitating discussions, and offering personalized support to students. Despite the fact that there is limited evidence for collaboration between conversational AIs and human teachers, future language education should incorporate conversational AIs to promote intelligence amplification and reduce human teachers' workload through classroom orchestration (Hyangeun, Insook, Yujung, 2022).

Method
As illustrated in Figure 1 this systematic review follows to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure, which consists of four processes: identification, screening, eligibility, and inclusion. PRISMA has been frequently used by researchers due to its comprehensiveness and adaptability to diverse studies. As a result, the goal of this study and the systematic review process are as follows.

Figure 1: PRISMA Systematic Review Adapted from M.J.;McKenzie et.al.

a.   Identification Phase
The PRISMA guidelines state that the identification phase is the initial step in the systematic review process. In keeping with the goal of this study, three databases—the Educational Resources Information Centre (ERIC), Scopus, and Web of Science (WoS)—were picked for this

systematic review. In order to adhere to the structures that were intended to be studied, the essential phrases in this systematic review were carefully chosen. In learning English, terms connected to Artificial Intelligence (AI) were used. Table 1 displays the search string that was employed in this study. After the automatic search in the first phase, 921 items were found overall.

Table 1
Search String for Systematic Literature Review

Database	Search String
ERIC	Artificial Intelligence or AI in English language learning
SCOPUS	TITLE-ABS-KEY(("Artificial Intelligence"OR "AI") AND ("ESL" OR "English language learning*" OR "EFL" OR "English as foreign language" OR "English as second language"))
Web of Science (WoS)	TS=(("Artificial Intelligence" OR "AI" AND "ESL" OR "English language learning*" OR "EFL" OR "English as foreign language" OR "English as second language"))□

b. Screening Phase

After finding the articles, the PRISMA model suggests the screening phase as the next step. There are 602 articles were taken out because duplicate papers that occur in multiple databases are rejected at this stage, leaving 602 articles for further screening. The inclusion and exclusion criteria listed in Table 2 below were used to screen these articles once again. In all, 452 papers were disregarded because they were unavailable, not journal articles, unrelated to ESL/EFL, AI, or both. As a result, 56 papers were kept for further review.

Table 2
Inclusion and Exclusion Criteria

Inclusion	Exclusion
Publish in 201-2023	Published before 2014
Written in English language	Written in Spanish or other language
Accessible	Inaccessible
Primary Research	Not primary research e.g : conference, review paper
Indexed in WoS, Scopus & ERIC	Not a journal article
Artificial Intelligence in ESL/EFL	Not Artificial Intelligence
Artificial Intelligence	No learning setting

c.   Eligibility

In the third phase, which is the eligibility phase, the selected articles are thoroughly checked to make sure they meet the inclusion criteria mentioned above. This is vital in ensuring the data obtained from the study has good quality and reliability. From the 56 articles remaining, another 34 articles rejected, which makes the remaining articles to be a total of 22 articles. It is very important to select the articles that relates the Artificial Intelligence with the ESL learning because it is important to see the research gap in this paper. There have been few researches that focuses about AI in the ESL classroom as compared to AI in education. There are vast researches on the AIEd (Artificial Intelligence in Education) but little attention has been given on the ESL classroom aspect. The findings also showed there is a research gap between AIEd and ESL classroom aspect where little research has been done to study and explore on the effectiveness, drawbacks, challenges, and applications of AI that can be implemented in ESL classroom.

d.   Included

The articles for this review focus on the benefits and challenges of using AI in the ESL classroom. The studies included are displayed in Table 3. Based on the table, 3 articles were extracted from 8 ERIC, 13 articles from Scopus and 1 from WoS. The majority of the studies were carried out at the higher education level, including universities and colleges. The articles selected are important to identify the applications of AI that has been used in the ESL classroom, the benefits and drawbacks of the applications and also to identify the challenges. Besides that, Table 3 also present the data of selected articles based on their respected countries. The articles selected in this paper shown there is little research been done in Malaysia on the aspect area of Artificial Intelligence in Education (AIEd) and none of the articles selected in this paper are from Malaysia.

Table 3
Included Articles and Their Respective Countries of Research

No	Study	Database	Country
1	Benali, A. 2021	ERIC	Canada
2	Kent, 2022	ERIC	Korea
3	Meng-Yue C. Dan L. & Jung W., 2020	ERIC	China
4	Xu B. & Ieva M. G., 2021	ERIC	Latvia
5	Xu J, He S., Jiang S., Yang Y. And Cai S., 2019	ERIC	Beijing, China
6	Obari H. & Lambacher S., 2019	ERIC	Japan
7	Dian Toar Y. G. Sumakula, Fuad Abdul Hamied, 2022)	ERIC	Indonesia
8	Johanathan Woodworth & Khaled Barkaoui, 2020	ERIC	Canada
9	Albatool Abalkheel, 2022	SCOPUS	Saudi Arabia
10	Heloísa Orsi Koch Delgado, 2020	SCOPUS	Brazil

11	Aminah Almutairi, Alexander Gegov, Mo Adda, Farzad Arabikhan, 2020	SCOPUS	United Kingdom
12	John Maurice Gayed, May Kristine Jonson Carlon, Angelu Mari Oriola, Jeffrey S. Cross, 2022	SCOPUS	Tokyo, Japan
13	Shaojie Liu, 2022)	SCOPUS	China
14	Jan Wira Gotama Putra, Simone Teufel, Takenobu Tokunaga, 2023	SCOPUS	Tokyo & Uk
15	Xin An,Ching Sing Chai,Yushun Li,Ying Zhou,Xi Shen,Chunping Zheng, Mengyuan Chen,2022	SCOPUS	China
16	Beatriz Peña-Acuña & Rafael Crismán-Pérez, 2022	SCOPUS	Spain
17	Chunpeng Zhai, Santoso Wibowo, 2023	SCOPUS	Australia
18	Meijin Hsiao And Maosheng Hung, 2022	SCOPUS	China
19	Fenglin Jia, Daner Sun, Qing Ma and Chee-Kit Looi, 2022	SCOPUS	Hong Kong, China
20	Zhe Zhang, 2022	SCOPUS	China
21	Jiaxin Liu, Xianghu Liu, and Chuan Yang, 2022	SCOPUS	China
22	Donghwa Lee,Hong-Hyeon Kim, Seok-Hyun Sung, 2023	Wos	Korea

Table 3 showed the articles included based on their respective countries. The findings reveal the researchers have conducted their research based on their respective countries on the research topic AI in ESL classroom and the findings revealed that 8 researches are from China including Beijing and Hong Kong, 2 articles from Canada, 2 from Korea, 3 from Japan, 2 from United Kingdom, and the rest is from Latvia, Indonesia, Saudi Arabia, Brazil, Spain and Australia but none from Malaysia.

Results
This review analysed the articles interpretively, categorizing the themes for the research questions. The themes were classified based on the platform mentioned in the literature review to answer the research questions. All articles selected were exported to a referencing software, Mendeley. Then, thematic analyses were carried out to identify the main themes to answer the following research questions:

RQ 1 : What are the benefits of implementing AI in the ESL classroom?
RQ 2 : What are the challenges of implementing AI in the ESL classroom?

Based on the research question above, Table 4 will display the data on the main findings for each research and the benefits, drawbacks and challenges will be further discussed in the discussion part. The selected articles have been analyzed according to the two aspects of the questions; benefits, and challenges of using AI application for ESL/EFL/TESOL classroom.

No	Study	Database	Findings
1	(Benali, A. 2021)	ERIC	Benefits of Using Automatic Writing Feedback
2	(Kent, 2022.)	ERIC	Advantages and Disadvantages of using Voice over Interfaces in TESOL classroom
3	(Meng-Yue C. Dan L. & Jung W., 2020)	ERIC	Benefits of using an auxiliary system of intelligent English culture teaching
4	Xu B. & Ieva M. G., 2021)	ERIC	advantages of using AI in China's English teaching in the classroom.
5	Xu J, He S., Jiang S., Yang Y. And Cai S.,2019)	ERIC	advantages the usage of the AR application
6	(Obari H. & Lambacher S.,2019)	ERIC	Benefit of Using AI Speakers Google Home Mini and Amazon Alexa as part of Blending Learning in English Skills in native Japanese undergraduate
7	(Dian Toar Y. G. Sumakula, Fuad Abdul Hamied)	ERIC	Teachers' perception believed that AI can benefits the students and teachers.
8	(Johanathan Woodworth & Khaled Barkaoui, 2020)	ERIC	The use of Automatic Writing Feedback can support the BL program incorporating AI speakers improved the students' overall English skills, particularly listening comprehension. The results suggest the integration of AI
9	(Albatool Abalkheel, 2022)	SCORPUS	Benefits of AI and Bloom Digital Taxonomy can help to overcome the challenges of pandemics.
10	(Heloísa Orsi Koch Delgado, 2020)	SCORPUS	Benefits and drawbacks of using AI in adaptive learning.
11	(Aminah Almutairi, Alexander Gegov, Mo Adda, Farzad Arabikhan, 2020)	SCORPUS	AI – based English Learning Framework can assists the students in learning English as a foreign language.

12	(John Maurice Gayed, May Kristine Jonson Carlon, Angelu Mari Oriola, Jeffrey S. Cross,2022)	SCORPUS	Impacts of using AI KAKU on students writing
13	(Shaojie Liu,2022)	SCORPUS	Benefits of integrating AI technology with English classroom
14	(Jan Wira Gotama Putra, Simone Teufel, Takenobu Tokunaga,2023)	SCORPUS	Benefits of using of ICNALE-AS2R, containing essays written by English-as-foreign-language learners from various Asian countries, that have been annotated with argumentative structure and sentence reordering.
15	(Xin An,Ching Sing Chai,Yushun Li,Ying Zhou,Xi Shen,Chunping Zheng, Mengyuan Chen,2022)	SCORPUS	Positive impacts on PE, SI, AIL-TK, and AI-TPACK had significant positive predictive power on BI; and EE, FC, AI-TPK had indirect effects on BI.
16	(Beatriz Peña-Acuña & Rafael Crismán-Pérez,2022)	SCORPUS	Using the AI application to improve learning oral and writtenskills for interacting in English.
17	(Chunpeng Zhai, Santoso Wibowo,2023)	SCORPUS	The use of AI dialogue system in EFL is still at the infancy stage though it provides benefits.
18	(Meijin Hsiao And Maosheng Hung,2022)	SCORPUS	AI algorithm model can provide positive impacts to the learners especially for grammatical error detection.
19	(Fenglin Jia, Daner Sun, Qing Ma And Chee-Kit Looi, 2022)	SCORPUS	Benefits and challenges in the integration of AI into facilitating language teaching and learning guided by the mobile learning principle.
20	(Zhe Zhang,2022)	SCORPUS	The knowledge of students about cross cultural knowledge is very limited thus AI can benefit the students.

21	(Jiaxin Liu, Xianghu Liu, And Chuan Yang,2022)	SCORPUS	positive and satisfactory attitudes towards the potential of ASR in oral training and believed that the technology could meet many of their needs such as the scoring system to help them more intuitively understand the real speaking level.
22	(Donghwa Lee,Hong-HyeonWos Kim, Seok-Hyun Sung, 2023)		Benefits of using LGC-based learning," setting specific study objectives in the design, development, and testing of an AI-

based system that can facilitate Korean students' LGC-based English language learning experience.

Discussion
Benefits of Using AI in ESL Classroom
Based on the findings, there are a few benefits of implementing AI in the ESL classroom. The ability to experience personalized, adaptable, inclusive, and engaging learning is considered as a possible benefit of AI-powered tools in education (Delgado et al., 2020). The AI resources support teachers in developing more sophisticated and stimulating learning environments than would otherwise be possible while also assisting learners in developing the information and skills necessary for a changing labour market. Apart from that, (Delgado et al., 2020) also mentioned regardless of the use of AI as part of technology integrated in the ESL classroom, the human element of education should not be overlooked or forgotten by teachers when utilizing technology in the classroom. Therefore, certain software enables teachers to include personal inquiries in the learning path in addition to paying attention to their students' feelings.

In addition to that, another contribution of AI in the ESL classroom is application of Artificial Intelligence adaptive learning tools: the teaching of English in focus educational data mining6 techniques to determine whether students are regularly attending class or turning in their assignments in order to identify the risk of school evasion is one of the many contributions of AIEd currently in use. An additional benefit of AIEd is the ability to provide efficient virtual one-on-one tutoring in a class of 20 or 30 pupils, freeing up the teacher to concentrate on social and creative activities. In fact, given their understanding of each student as an individual, intelligent tools can even help construct groups of students with complementary knowledge and abilities. Additionally, group discussions can be summarized and analyzed using machine learning so that the instructor can see when students are deviating from the subject or failing to cooperate (Delgado et al., 2020).

AI is an umbrella term to describe an automated device that can behave of human intelligence processes such as learning, reasoning, self-correction and can provide benefits to the learners and teachers. The AWE, AES, and AWCF elements of new writing apps can be provided in one integrated application, which might potentially offer versatile and time-saving improvements to the writing curriculum (Koltovskaia, 2020). The development of ESL research writing may be aided by the new AI Applications' thorough instructional practice and plagiarism detection feature (Zawacki-Richter et al., 2019). Research conducted by (Nazari et al., 2021) revealed

the effectiveness of the AI application's group format for research writing in L2 Ph.D. students. The findings showed that, when compared to NEAI, AI was more effective at boosting academic emotion, engagement, and self-efficacy. This is supported by to Cavalieri and Dianati (2016) and Parra and Calero (2019), Grammarly can help students develop their EFL writing skills. The use of AWE can boost pupils' writing confidence, particularly when they get encouraging comments. When no human support is available, intelligent feedback can help students strengthen their writing autonomy by allowing them to examine their mistakes, recognize the wrong writing patterns, and model the mistakes (Nazari et al., 2021).

Challenges in Implementing AI in ESL Classroom
As instructional technology gains more sophisticated features, potential social and ethical concerns are brought up (Richards and Dignum, 2019). In a survey of the literature on the use of (humanoid) robots in the classroom, four topics were used to analyze their ethical impact: (1) privacy; (2) replacing humans; (3) effects on children; and (4) responsibility. The nature of intelligence, how to balance the interests of individuals and the general public, how to deal with moral conundrums, and how automation will affect the labour market are just a few of the fundamental concerns surrounding AI that cannot be fully addressed by technology ((Jia et al., 2022). Due to the interdisciplinary nature of these issues, educational programs' roles and contents must evolve (Dwivedi et al., 2019).

Another challenge is the influence, governance, ethics, and accountability of these technologies around the world are urgently in question due to the fast-expanding capabilities and presence of AI-based systems in our daily lives (Dwivedi et al., 2019). How can decisions be made regarding the application of AI be made? How can the various needs and viewpoints of those who employ, employ these technologies, interact with them, and are affected by them be integrated? How can we use AI systems to their fullest potential without risking the development of new biases and inequalities or worsening those that already exist? Computer science or engineering alone cannot provide an answer to these questions. Thus, it remains as the biggest challenges towards implementing AI in ESL classroom ((Jia et al., 2022).

Based on the research by (Abalkheel, 2021) on the use of AI and Digital Taxonomy Bloom supported by Ja'ashan (2020) took into account the high expectations set for student accountability and performance. Although it was important during this epidemic, instructors who believed that their face-to-face instructional approaches profoundly affected students' learning were unwilling to incorporate technology into their practice (Gulnaz, Althomali, & Alzeer, 2020; Ma et al., 2021). Therefore, it was determined that low self-efficacy is another issue preventing Saudi EFL instructors from reacting to this unexpected teaching alternative mode during the outbreak (Rahman, 2020). Thus, it is also one of the challenges discovered in this study on the use of AI and Digital Taxonomy Bloom in learning English in Saudi Arabia. The other challenges is the teachers' competencies. According to research, Saudi instructors received insufficient training on teaching and learning strategies related to online learning (Abalkheel, 2021).

Future Research
In recent years, the integration of Artificial Intelligence (AI) into education has gained significant attention worldwide. Specifically, in the context of English as a Second Language (ESL) classrooms, AI offers immense potential for enhancing language learning experiences. Future research should shed light on the application of AI in the ESL classroom within the Malaysian context, identifying key areas for future research and exploration.

However, there have been little research has been done about Artificial Intelligence in ESL classroom under Malaysian context. As we are shifting towards AI in education under 4IR (Industrial Revolution) which means education also requires shifting in align with IR, more research should be done to explore the potential of using AI in Malaysian ESL classroom. Future research could delve into the unique characteristics, needs, and challenges faced by Malaysian ESL learners. Exploring the language proficiency levels, specific areas of difficulty, and cultural factors that influence language learning in the Malaysian context would enable the development of AI solutions tailored to address these challenges effectively when implementing AI in the ESL classroom. Malaysian consists of diverse ethnic groups, hence the acceptance of AI in education besides language proficiency levels and also other aspects will be an interesting topic to research on to give awareness towards policy makers, teachers, and also the public on the current shift in education, Artificial Intelligence. Addressing the challenges, benefits, and drawbacks of AI under Malaysian context might reveal different issues and problems as compared to this systematic literature review paper.

There are a few interesting aspects or area of research that can be done for future research under Artificial Intelligence but in Malaysian ESL classroom context. Researchers could investigate the development and efficacy of AI-powered language learning platforms designed specifically for Malaysian ESL learners. These platforms could incorporate local contexts, cultural nuances, and diverse Malaysian English varieties to provide relevant and engaging language learning experiences. Besides, future research could explore effective ways to integrate AI into ESL pedagogy in Malaysian schools. Investigating how AI can be seamlessly integrated into lesson plans, curriculum design, and teaching practices would provide insights into optimizing the benefits of AI while maintaining a balanced approach that values human interaction and guidance. Moreover, research could focus on the development of AI-based assessment tools that align with the Malaysian ESL curriculum and proficiency standards. These tools could provide accurate and timely feedback, track learners' progress, and identify areas for improvement, thereby supporting teachers in making data-driven instructional decisions.

Investigating the potential of AI to personalize language instruction for Malaysian ESL learners would be valuable. Research could explore how AI algorithms can adapt content, exercises, and learning paths to suit individual learner preferences, needs, and learning styles, ultimately enhancing learner engagement and outcomes. Future research also could explore the role of AI-powered virtual language assistants in Malaysian ESL classrooms. Investigating how these assistants can support speaking and listening practice, provide conversational opportunities, and offer personalized feedback would contribute to a deeper understanding of their impact on language acquisition. Last but not least, considering Malaysia's multicultural and multilingual society, research could explore how AI in the ESL classroom can address the unique linguistic and cultural diversity present in Malaysian schools. Investigating how AI can foster inclusivity, support learners from diverse backgrounds, and promote intercultural understanding would be valuable.

As AI continues to advance and shape the field of education, its integration into the Malaysian ESL classroom presents exciting opportunities for enhancing language learning experiences. By undertaking research focused on the Malaysian context, future researchers can uncover insights into tailoring AI solutions to address the specific needs and challenges faced by Malaysian ESL learners. This research will contribute to the development of effective AI-driven tools, pedagogical approaches, and policies that foster enhanced language acquisition

and support educators in their pursuit of educational excellence in ESL classrooms across Malaysia.

Conclusion

The advantages and disadvantages of employing Artificial Intelligence (AI) in the setting of English as a Second Language (ESL) classrooms have been thoroughly investigated in this systematic research review. The research's current state is clarified by the findings, which also offer researchers, educators, and policymakers' useful information. The research gap has been filled by exploring the challenges, benefits and drawbacks of AI in the ESL classroom since most of the research focusing on other education fields. Hopefully there are more research on the Malaysian ESL classroom context will be explored by future researchers.

The review has shown that AI technologies have many potential advantages for teaching ESL. Intelligent tutoring systems are capable of offering individualized feedback and adaptive learning opportunities that are tailored to the various learning demands of each individual studentIn multilingual classrooms, machine translation software facilitates effective communication and comprehension, and virtual reality platforms provide immersive environments for language learning. The analysis also identified a number of difficulties and disadvantages related to the application of AI in ESL classrooms. Given that AI systems frequently need access to personal data, privacy concerns have become a major problem.

Additionally, there are substantial obstacles to successful integration due to a lack of teacher training and technology limitations. Concerns about justice and equity in the learning process are also raised by the possibility for bias in AI algorithms. It is clear that additional study is required to address these issues and fully reap the rewards of AI in ESL classrooms. To determine how AI will affect the growth of linguistic competence, learner motivation, and intercultural competence, long-term empirical investigations are necessary. Additionally, efforts should be taken to guarantee that AI technologies are created with ethics and inclusivity in mind, taking into account the diverse linguistic and cultural backgrounds of ESL learners.

In conclusion, the integration of AI in ESL classrooms holds great promise for enhancing language instruction. While there are challenges and drawbacks to be addressed, the benefits of AI, such as personalized learning experiences, enhanced language practice, and immersive environments, cannot be overlooked. By carefully navigating the challenges and leveraging the benefits, educators, policymakers, and researchers can harness the power of AI to create effective and inclusive language learning environments, preparing ESL learners for success in the digital age.

Reference

Ali, Z. (2020). Artificial Intelligence (AI): A Review of its Uses in Language Teaching and Learning. IOP Conference Series: Materials Science and Engineering. https://doi.org/10.1088/1757-899X/769/1/012043.

AlGhamdi, A. (2022). Artificial Intelligence in Education as a Mean to Achieve Sustainable Development in Accordance with the Pillars of the Kingdom's Vision 2030—A Systematic Review. International Journal of Higher Education. https://doi.org/10.5430/ijhe.v11n4p80.

Bhatt, P., & Muduli, A. (2022). Artificial Intelligence in learning and development: a systematic literature review. European Journal of Training and Development. https://doi.org/10.1108/ejtd-09-2021-0143.

Brummelen, J., & Lin, P. (2020). Engaging Teachers to Co-Design Integrated AI Curriculum for K-12 Classrooms. Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3411764.3445377.

Chrysafiadi, K., & Virvou, M. (2021). Evaluating the learning outcomes of a fuzzy-based Intelligent Tutoring System. 2021 IEEE 33rd International Conference on Tools with Artificial Intelligence (ICTAI). https://doi.org/10.1109/ICTAI52525.2021.00221.

Chiu, T. (2021). A Holistic Approach to the Design of Artificial Intelligence (AI) Education for K-12 Schools. TechTrends, 65, 796 - 807. https://doi.org/10.1007/s11528-021-00637-1.

Dai, L., & Zheng, X. (2019). Research on the Reform and Practice of Teaching Mode in Colleges and Universities under the Background of Artificial Intelligence–A Case Study of Statistical Curriculum. DEStech Transactions on Social Science, Education and Human Science. https://doi.org/10.12783/DTSSEHS/ICESD2019/29860.

Elnaggar, O., & Arelhi, R. (2021). Quantification of Knowledge Exchange Within Classrooms: An AI-based Approach. The European Conference on Education 2021: Official Conference Proceedings. https://doi.org/10.22492/issn.2188-1162.2021.17.

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

Hurt, J., Runyon, M., Hammond, T., & Linsey, J. (2020). A Study on the Impact of a Statics Sketch-Based Tutoring System Through a Truss Design Problem. 2020 IEEE Frontiers in Education Conference (FIE). https://doi.org/10.1109/FIE44824.2020.9274208.

Hinojo-Lucena, F.-J., Aznar-Díaz, I., Cáceres-Reche, M.-P., & Romero-Rodríguez, J.-M. (2019). Artificial Intelligence in higher education: A bibliometric study on its impact in the scientific literature. Education Sciences, 9(1), 51. https://doi.org/10.3390/educsci9010051.

Ji, H., Han, I., & Ko, Y. (2022). A systematic review of conversational AI in language education: focusing on the collaboration with human teachers. Journal of Research on Technology in Education, 55, 48 – 63 https://doi.org/10.1080/15391523.2022.2142873.

Kashive, N., Powale, L., & Kashive, K. (2020). Understanding user perception toward Artificial Intelligence (AI) enabled e-learning. The International Journal of Information and Learning Technology. https://doi.org/10.1108/ijilt-05-2020-0090.

Kim, J., Merrill, K., Xu, K., & Sellnow, D. (2020). My Teacher Is a Machine: Understanding Students' Perceptions of AI Teaching Assistants in Online Education. International Journal nof Human–Computer Interaction. https://doi.org/10.1080/10447318.2020.1801227.

Lee, L., Dabirian, A., McCarthy, I., & Kietzmann, J. (2020). Making sense of text: artificial intelligence-enabled content analysis. European Journal of Marketing, 54, 615-644. https://doi.org/10.1108/ejm-02-2019-0219.

Mageira, K., Pittou, D., Papasalouros, A., Kotis, K., Zangogianni, P., & Daradoumis, A. (2022). Educational AI Chatbots for Content and Language Integrated Learning. Applied Sciences. https://doi.org/10.3390/app12073239.

Meskó, B. (2019). The Real Era of the Art of Medicine Begins with Artificial Intelligence. Journal of Medical Internet Research. https://doi.org/10.2196/16295.

Nazari, N., Shabbir, M., & Setiawan, R. (2021). Application of Artificial Intelligence powered digital writing assistant in higher education: randomized controlled trial. Heliyon, 7. https://doi.org/10.1016/j.heliyon.2021.e07014.

Ng, Davy. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2023). Teachers' AI

digital competencies and twenty-first century skills in the post-pandemic world. *Educational Technology Research and Development*, *71*(1), 137–161. https://doi.org/10.1007/s11423-023-10203-6

Pan, X. (2022). Design of the intelligent online learning platform. 2022 14th International Conference on Measuring Technology and Mechatronics Automation (ICMTMA). https://doi.org/10.1109/icmtma54903.2022.00239.

Pantelimon, F., Bologa, R., Toma, A., & Posedaru, B. (2021). The Evolution of AI-Driven Educational Systems during the COVID-19 Pandemic. Sustainability. https://doi.org/10.3390/su132313501.

Pazilah, F., Hashim, H., & Yunus, M. (2019). Using Technology in ESL Classroom: Highlights and Challenges. Creative Education. https://doi.org/10.4236/ce.2019.1012244.

Pikhart, M. (2020). Intelligent information processing for language education: The use of artificial intelligence in language learning apps. Procedia Computer Science, 176, 1412 - 1419. https://doi.org/10.1016/j.procs.2020.09.151.

Reiss, M. (2021). The use of AI in education: Practicalities and ethical considerations. London Review of Education. https://doi.org/10.14324/LRE.19.1.05.

Vittorini, P., Menini, S., & Tonelli, S. (2020). An AI-Based System for Formative and Summative Assessment in Data Science Courses. International Journal of Artificial Intelligence in Education, 31, 159 - 185. https://doi.org/10.1007/s40593-020-00230-2.

Putri, S., Amri, S., & Ahmad, A. (2020). THE STUDENTS' DIFFICULTIES FACTORS IN SPEAKING. J-Shelves of Indragiri (JSI). https://doi.org/10.32520/jsi.v1i2.1059.

John, P., & Woll, N. (2020). Using Grammar Checkers in an ESL Context: An Investigation of Automatic Corrective Feedback. the CALICO Journal. https://doi.org/10.1558/cj.36523.

Sariani, S., Khairat, M., & Yaningsih. (2021). An Optimization of Language Learning in Writing Through E-Learning: Encountering Covid-19 Pandemic. . https://doi.org/10.26858/IJOLE.V5I1.15375.

Siswa, T. (2020). The Effectiveness of Artificial Intelligence on Education: Learning During the Pandemic and in the Future. International Journal of Engineering and Computer Science. https://doi.org/10.31295/IJECS.V3N1.195.

Shekhar, G., D'souza, R., & Fernandes, K. (2020). AI-Driven Contextual Virtual Teaching Assistant Using RASA. Proceedings of the 21st Annual Conference on Information Technology Education. https://doi.org/10.1145/3368308.3415442.

Suta, P., Lan, X., Wu, B., Mongkolnam, P., & Chan, J. (2020). An Overview of Machine Learning in Chatbots. . https://doi.org/10.18178/ijmerr.9.4.502-510.

Syzdykbayeva, A., Baikulova, A., & Kerimbayeva, R. (2021). Introduction of Artificial Intelligence as the Basis of Modern Online Education on the Example of Higher Education. 2021 IEEE International Conference on Smart Information Systems and Technologies (SIST). https://doi.org/10.1109/SIST50301.2021.9465974.

Wen, J. (2021). Innovative Application of Artificial Intelligence Technology in College Physical Education. Journal of Physics: Conference Series. https://doi.org/10.1088/1742-6596/1881/4/042028.

Winata, G., Madotto, A., Wu, C., & Fung, P. (2019). Code-Switched Language Models Using Neural Based Synthetic Data from Parallel Sentences. . https://doi.org/10.18653/v1/K19-1026.

Wong, K., Gallant, F., & Szumacher, E. (2020). Perceptions of Canadian radiation oncologists, radiation physicists, radiation therapists and radiation trainees about the impact of

Artificial Intelligence in radiation oncology - national survey. Journal of medical imaging and radiation sciences. https://doi.org/10.1016/j.jmir.2020.11.013.

Yanhua, Z. (2020). The Application of Artificial Intelligence in Foreign Language Teaching. 2020 International Conference on Artificial Intelligence and Education (ICAIE). https://doi.org/10.1109/icaie50891.2020.00017.

Zawacki-Richter, O., Marín, V.I., Bond, M., Gouverneur, F., 2019. Systematic review of research on artificial intelligence applications in higher education – where are the educators? Int. J. Educat. Technol. Higher Educat. 16 (1).

Reference for The Selected Articles

Abalkheel, A. (2021). AMALGAMATING BLOOM'S TAXONOMY AND ARTIFICIAL INTELLIGENCE TO FACE THE CHALLENGES OF ONLINE EFL LEARNING AMID

POST-COVID-19 IN SAUDI ARABIA. International Journal of English Language and Literature Studies, 11(1), 16–30. https://doi.org/10.18488/5019.v11i1.4409

Almutairi, A., Gegov, A., Adda, M., & Arabikhan, F. (2020). Conceptual Artificial Intelligence framework to Improving English as Second Language. Advances in Engineering Education, 17, 87–91. https://doi.org/10.37394/232010.2020.17.11

An, X., Chai, C. S., Li, Y., Zhou, Y., Shen, X., Zheng, C., & Chen, M. (2023). Modeling English teachers' behavioral intention to use Artificial Intelligence in middle schools. Education and Information Technologies, 28(5), 5187–5208. https://doi.org/10.1007/s10639-022-11286-z

Delgado, H. O. K., de Azevedo Fay, A., Sebastiany, M. J., & Silva, A. D. C. (2020). Artificial Intelligence adaptive learning tools: the teaching of English in focus. Brazilian English Language Teaching Journal, 11(2). https://doi.org/10.15448/2178-3640.2020.2.38749

Gayed, J. M., Carlon, M. K. J., Oriola, A. M., & Cross, J. S. (2022). Exploring an AI-based writing Assistant's impact on English language learners. Computers and Education: Artificial Intelligence, 3. https://doi.org/10.1016/j.caeai.2022.100055

Hsiao, M., & Hung, M. (2022). Construction of an Artificial Intelligence Writing Model for English Based on Fusion Neural Network Model. Computational Intelligence and Neuroscience, 2022. https://doi.org/10.1155/2022/1779131

Jia, F., Sun, D., Ma, Q., & Looi, C. K. (2022). Developing an AI-Based Learning System for L2 Learners' Authentic and Ubiquitous Learning in English Language. Sustainability (Switzerland), 14(23). https://doi.org/10.3390/su142315527

Lee, D., Kim, H. hyeon, & Sung, S. H. (2023). Development research on an AI English learning support system to facilitate learner-generated-context-based learning. Educational Technology Research and Development, 71(2), 629–666. https://doi.org/10.1007/s11423-022-10172-2

Liu, J., Liu, X., & Yang, C. (2022). A study of college students' perceptions of utilizing automatic speech recognition technology to assist English oral proficiency. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.1049139

Liu, S. (2022). Construction and Computation of the College English Teaching Path in the Artificial Intelligence Teaching Environment. Computational Intelligence and Neuroscience, 2022. https://doi.org/10.1155/2022/3415999

Meng-yue, C., Dan, L., & Jun, W. (2020). A Study of College English Culture Intelligence- Aided Teaching System and Teaching Pattern. English Language Teaching, 13(3), 77. https://doi.org/10.5539/elt.v13n3p77

Nazari, N., Shabbir, M. S., & Setiawan, R. (2021). Application of Artificial Intelligence powered digital writing assistant in higher education: randomized controlled trial. Heliyon, 7(5). https://doi.org/10.1016/j.heliyon.2021.e07014

Peña-Acuña, B., & Crismán-Pérez, R. (2022). Research on Papua, a digital tool with Artificial Intelligence in favor of learning and linguistic attitudes towards the learning of the English language in students of Spanish language as L1. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.1019278

Peng, C. (2022). An Application of English Reading Mobile Teaching Model Based on K – Means Algorithm. Mobile Information Systems, 2022. https://doi.org/10.1155/2022/3153845

Putra, J. W. G., Teufel, S., & Tokunaga, T. (2023). Improving logical flow in English-as-a- foreign-language learner essays by reordering sentences. Artificial Intelligence, 320. https://doi.org/10.1016/j.artint.2023.103935

Sanosi, A. B. (2022). THE IMPACT OF AUTOMATED WRITTEN CORRECTIVE FEEDBACK ON EFL LEARNERS' ACADEMIC WRITING ACCURACY. Journal of

Teaching English for Specific and Academic Purposes, 10(2),301–317. https://doi.org/10.22190/JTESAP2202301S

Toar, D., Sumakul, Y. G., Hamied, A., & Sukyadi, D. (n.d.). LEARN Journal: Language Education and Acquisition Research Network Artificial Intelligence in EFL Classrooms: Friend or Foe? https://so04.tci-thaijo.org/index.php/LEARN/index

Wang, Y., Luo, X., Liu, C. C., Tu, Y. F., & Wang, N. (2022). An Integrated Automatic Writing Evaluation and SVVR Approach to Improve Students' EFL Writing Performance. Sustainability (Switzerland), 14(18). https://doi.org/10.3390/su141811586

Xu, B., & Margeviča-Grinberga, I. (2021). A discourse on innovation of english teaching in China from the perspective of Artificial Intelligence. Cypriot Journal of Educational Sciences, 16(5), 2313–2323. https://doi.org/10.18844/cjes.v16i5.6347

Zhai, C., & Wibowo, S. (2023). A systematic review on Artificial Intelligence dialogue systems for enhancing English as foreign language students' interactional competence in the university. Computers and Education: Artificial Intelligence, 4. https://doi.org/10.1016/j.caeai.2023.100134

Zhang, Z. (2022). The Cultivation of Cross-Cultural Communicative Competence in English Teaching under the Background of Artificial Intelligence and Big Data. Wireless Communications and Mobile Computing, 2022. https://doi.org/10.1155/2022/9566066