

# EXPLORING SOME ARTIFICIAL INTELLIGENCE TECHNOLOGIES THAT CAN BE APPLIED TO LEARNING IN ENGLISH AS A SECOND LANGUAGE CLASSROOM

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## Abstract

*This paper examines some Artificial Intelligence Technologies that can be applied to learning in English as a Second Language Classroom. It discusses the concept and components of Artificial Intelligence (AI). The paper also highlights AI development and interactions with education. An important part of this paper also explores learning English language using AI technologies. The major conclusion of the paper is that AI is anticipated to move and manipulate objects, reason about different perceptions and learning. It can also perform many other things that will make life simpler for humans and the teachers can choose the most effective method of English learning based on each user's requirements and time available. The paper then recommends that the role of AI should be to take away repetitive tasks that can be automated and assist teachers by providing feedback extracted from data during the process of content production in a human-in-the-loop manner.*

**Keywords:** Artificial Intelligence, Technology, Education, Learning, and English Language

## Introduction

Artificial is the intelligence shown by machines, whereas natural intelligence (NI) displayed by humans and other animals. Any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals is attributed to have Artificial Intelligence. As a whole, if a machine can initiate the cognitive functions of a human mind such as learning, communicating and problem solving, it is known as Artificial Intelligence. With the technology of deep learning in medicine, AI has already reached an advanced level in the diagnosing of diseases and speech synthesis by reading the neural activity of the cerebral cortex. AI can compose music and literary drafts, and draw pictures by analyzing the works of artists, writers, and musicians (Maghsudi, 2021). AI can already generate realistic photos and videos that are difficult to

distinguish from real ones. It recognizes a person's face to protect access to data on gadgets, such as banking. Chatbots already exist and are becoming increasingly popular to improve customer communication based on AI (Zilberman, 2019). The intelligent home system is one of the most popular technologies, which can monitor home security, control electricity and water consumption, network condition, clean the house, and generally make our life more comfortable. AI can distinguish odours and the mimic work of the human nervous system with the task of monitoring the environment ecology, as well as improving occupational safety at work. It is widely used in gaming. Studying the environment by trial and error based on AI is also an integral part of human development.

Moving from researchers' laboratories to our homes and gadgets, AI is penetrating our lives. The

advantages of AI are undeniable: the ability to process vast amounts of information in a short time, increase efficiency, and convenience, eliminate long-term processes and automate the usual with no fatigue. AI has become an essential part of the educational process. It can transform the functioning of the education system, increase the competitiveness of institutions and empower teachers and students at all levels (Dickson, 2017). Voice assistants, such as Amazon Alexa, Apple Siri, and Google Home, allow interaction with various learning materials anywhere and anytime without communicating with the teacher (Zilberman, 2019). Intelligent content means various learning materials, from digitized textbooks to customized interfaces. Using the possibilities of AI, students can study multiple courses and curricula worldwide.

### **The Concept and Components of Artificial Intelligence and the History of its Development**

The term AI was constructed first in 1956 by John McCarthy (McCarthy, Minsky, Rochester, & Shanno, 2006). At that time, the researchers came together to clarify and develop the concepts around thinking machines which up to this point, had been quite divergent. McCarthy is said to have picked the name AI for its neutrality; to avoid highlighting one of the tracks being pursued at the time for the field of thinking machines that included cybernetics, automata theory and complex information processing. The proposal for the conference said, 'The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it' (Marr, 2018). AI refers to a broad

field of science encompassing computer science, psychology, philosophy, linguistics, mathematics, and others. It becomes evident that there are many points of view on AI, and many definitions exist.

Dictionary definitions focus on AI that it is a sub-field of computer science and how machines can imitate human intelligence: a branch of computer science dealing with the simulation of intelligent behavior in computers; the capability of a machine to imitate intelligent human behavior' (Merriam-Webster). Different definitions of AI appear based on the goals that different professionals are trying to achieve with an AI system. Generally, people invest in AI development for one of these three objectives: build systems that think exactly like humans do (strong AI), just get systems to work without figuring out how human reasoning works (weak AI), and use human reasoning as a model but not necessarily the end goal (Marr, 2018). Amazon defines AI as the field of computer science dedicated to solving cognitive problems commonly associated with human intelligence, such as learning, problem-solving, and pattern recognition (Marr, 2018). Machine learning is so important to Amazon, they stated, Without ML, Amazon.com could not grow its business, improve its customer experience and selection, and optimize its logistic speed and quality (Marr, 2018). Machine and deep learning are the priority for Google AI and its tools to create smarter, more useful technology and help as many people as possible from translations to healthcare to make our smartphones even smarter. Facebook AI Research is committed to advancing the field of machine intelligence and is creating new technologies to give people better ways to communicate. IBM's three areas of focus include AI Engineering, building

scalable AI models and tools; AI Tech, where the core capabilities of AI such as natural language processing, speech and image recognition, and reasoning are explored and AI Science, where expanding the frontiers of AI is the focus" (Marr, 2018).

### **Artificial Intelligence and Education**

21st century era has been accompanied by many radical changes in the educational system as far as learning inputs, processes, and outcomes are concerned. Intelligent machines as applications of AI contribute to changing the roles played by schools, teachers, and learners. AI also changes the traditional and virtual patterns of interaction in the educational milieu. Teachers and learners will be dealing with interactive machines to share educational experience, and achieve the required objectives (Akintunde, 2023). These applications or technologies are capable of providing interactive educational platforms that conduct discussions with the students and respond to their questions and reactions (Zilberman, 2019). AI solves traditional classroom problems such as paying attention and motivation, caring for individual differences among learners, and supporting those with special needs. With feedback, improving the levels of student achievement, and developing positive attitudes towards teaching/learning, they will also provide solutions to the problem of interaction in large classrooms. These aspects will be directly and positively affected by employing AI applications in the teaching/learning process (Dickson, 2017). Al-Gayyar, (2013) indicates that AI applications vary, and intelligent systems of online electronic learning are among the most essential intelligent educational systems. These are the

most significant applications of AI use in education. They are the outcome of merging many systems and applications in the field of AI such, as Intelligent Tutoring Systems, Activating the Internet, Activating hypermedia, and Activating distance E-education (pp. 503-504). Muhammad (2014) describes various applications of AI, 'which include electronic neural networks, developed hybrid systems, applications of developmental algorithms, electronic auto-copying, adaptive electronic platforms, bio-robots, Nano-technology, chemical and organic systems, and advanced controlling systems' (p. 18). Borge (2016) analyzes the importance of AI applications in the results of student evaluation processes at the university and pre-university stages. AI makes it easy for instructors to measure their students' level precisely, which is something often difficult to achieve. It enables university teaching staff to assess the status of the educational processors and determine deficiencies in the lectures, scientific content, and the educational material introduced to students. AI helps meet the needs of each student according to their abilities and needs by submitting home assignments and monitoring the scores obtained by each student because it has intelligent programmes that identify common mistakes. It gives the instructors hints as to what the problems are, and introduces instant feedback in a file designed separately for each student. Furthermore, AI tools and programmes can cope with classroom density (pp. 10-11).

Nowadays, studies refer to the diversification of AI education applications, including programmed learning and other open-source high technology. The importance of AI applications according to Muhammad, (2014) is determined by the ability: - to suit the needs and skills of the learners;

- to work according to their educational preferences; - and to monitor the progress rate of each learner. These applications contain tracks that suit all learners despite differences among their levels, boost their learning motivation, and cope with students' low levels of attention. They provide feedback that indicates student achievement levels and points of weakness and strength in the scientific content (Borge, 2016). They ensure that the curriculum subjects are integrated parts of each subject, and that the learner has mastered one section before moving on to a more advanced one. The scientific content can be introduced in the form of problems, which the students work out according to their self-study streams. Instructors monitor this process and provide guidance and feedback. AI tutoring systems can replace instructors as they have programmes that provide advice automatically and enable learners to use self-study skills (Kamuka, 2015). Teaching English as a Second Language (ESL) is regarded as developing communicative competence, which is achieved through knowing how to use language elements and vocabulary to develop the skills of listening, speaking, reading, and writing. It also includes using language to produce texts, and how to use it to understand reading passages. The process of language development is based on communication as a goal and as a process. Therefore, using traditional and digital communication strategies in the teaching/learning processes and activities is necessary. It is required to use AI applications such as simulation and communication programmes as they simulate real-life communication situations in English, introduce practical training in language skills, and educational games based on language (Kamuka, 2015). Communication tools based on AI help

design situations for practicing the accurate pronunciation of letters and words through sound drills and visual media. Such devices provide exercises for describing and interpreting images and everyday situations, for listening, and for practicing guided pronunciation. They also allow learners to practice language skills and provide feedback for guidance (Dickson, 2017). Some programmes have language drills that give training in communication through using language skills to guarantee that learners reach proficiency levels (Barnes-Hawkins, 2016). Radwan, (2017) indicates that AI can be used to overcome many of the difficulties of teaching/learning English: using Information Retrieval techniques to build the ability to comprehend reading passages; employing Machine Translation to develop students' translation skills; using Automatic Speech Recognition techniques to learn correct pronunciation, using Text- to-Speech techniques for blind and visually impaired students; using open digital language dictionaries to enrich the vocabulary of the student; using intelligent programmes to augment speaking skills for English learners; implying a writing evaluation technique to teach paragraph and essay writing (Zilberman, 2019).

### **Learning English Language Using Artificial Intelligence Technology**

As one of the most sophisticated information systems in the world at first, AI technology studies how robots can do intelligent tasks that only humans can complete (Han, 2019). The advancement of technology also makes it simpler for us to do some tasks, including studying and learning English (Akintunde & Angulu, 2015). AI technology is one of the technologies that is frequently discussed among the general public. Numerous new

opportunities are being created by technology for language learning (Maghsudi, 2021). According to Luo and Cheng (2020), AI technologies are the driving force behind foreign language instruction. AI technology, among other things, may effectively address issues including limited instructional time, available space, resources, and a tedious measuring procedure. According to Thornton (2007) practically all AI algorithms and technologies may be claimed to do some problem-solving. Thus, this fluid problem-solving and human-like ability to perceive behavior and purpose are all included in the large field of study known as AI. (Cobar, 2019). With the ability to mimic intelligence and make judgments using a method akin to human thinking, AI aims to develop intelligent computers that think and behave like people (Salvaris, Dean & Tok.,, 2018). The three components of how AI operates are having many data, doing repeated tasks, and using clever algorithms.

The programme can learn automatically by recognizing patterns and other elements in the data (Han, 2019). AI is a highly diverse subject of research. Machine learning, neural networks, cognitive computing, computer vision, and scientific language processing are a few of the ideas, methodologies, technologies, and sub-fields that fall under the umbrella of AI. Humans may use an almost effortless method or one that is incredibly difficult and still little understood when communicating with others through language (Cobar, 2019). Therefore, developing a computer system that generates and translates English language fragments has been quite challenging. Language emerged among intelligent beings as a way of communication, which is one reason for the problem. The growth of digital platforms has made teaching and

studying English simpler (Han, 2019). AI technology has enabled advanced English language proficiency. Combining digital and language literacy can help one become more globally competent (Maghsudi, 2021). The text processing of a language serves as the foundation for AI. The language one learns becomes more and more precise the more advanced the AI. Therefore, utilizing AI technology would improve the teaching and learning of foreign languages (Yingsoon, 2021).

AI contributes to disseminating varied information and enhances the effectiveness of English learning (Maghsudi, 2021). The availability of various forms of educational technology makes it simpler for these students to comprehend what the instructor has conveyed. Even kids may efficiently study without needing to speak with professors in person. Many applications for learning languages based on AI technology may be utilized by English instructors, students, and learners. The following are some AI technology that can be applied to learning English.

### **The Impact of Google Translate**

Google Translate can define words and pronounce words in a new language. The users may instantly interpret street signs using the smartphone app 'Translate'. Websites may be translated into some languages using Google Translate as well (Smallwood, 2015). Although Google has produced many user tools, Google Translate may be the most crucial programme, accessed at <http://google.com/translate> (Smallwood, 2015, p. 51). Even a translator has been used in place of text speech. Google Board has already been connected with programmes like Google Translate. Therefore, translating from Indonesian to English or vice versa is as simple as typing.

According to Covili (2016), Google Translate is notable for five reasons, including the following: Up to 50 languages are supported by Google Translate. Using Google Translate, users may translate complete documents. The primary use of Google Translate in teaching and learning English is as an online translator. Students may use it to translate words, phrases, sentences, and paragraphs from Indonesian to English or Indonesian, frequently used in translation exercises (Cobar, 2019). To check the spelling of terms that result from errors, utilize Google Translate. When it comes to verifying English spelling, it is pretty helpful. You may use Google Translate to learn how to pronounce words in other languages. Google Translate may be used by students who wish to study English for free, mainly to learn how to pronounce words.

### **Translating Texts to Speech**

Text-to-speech is an extra capability of Google Translate. The text-to-speech feature of Google Translate allows words translated from several languages, including English, to be uttered in various languages. Google Translates text-to-speech tool reads words more smoothly and with a less flat tone than the competition. A Text-To-Voice system is a device that can automatically phonetically translate text into speech (the arrangement of phonemes to form an address). Because this system has an infinite vocabulary, it can pronounce any word. Regarding instructing and learning English, Text-To-Speech (TTS) may turn computer-generated text into pronunciation (audio), where the pronunciation can be modified for speed and intonation, and the output audio format can be recorded as an audio file. TTS technology may enhance English learning materials and speed up the

teaching and learning process, particularly in the English laboratory (Yudhistiro, 2016).

### **Assessment-Based Learning Environment for English (ABLE)**

Assessment-Based Learning Environment for English is an environment where students may study grammar via assessment. (Zapata-Rivera, Vanwinkle, Shute, Underwood and Bauer, (2007) conceived of this method in addition to others. In assessment-based learning environments, also known as ABLEs, the information obtained from various assessments is utilized to direct instruction (e.g., formative and summative). 'EnglishABLE' refers to a learning environment oriented on tests designed to assist English language learners (ELLs) learn English grammar. EnglishABLE uses a TOEFL CBT job library to generate new upgraded assignments for specific ELL component skills. In addition, learner packages can be found in an adaptive and scaffold learning environment. These packages are designed to assist students in acquiring different English grammatical ideas.

### **Orai**

Orai may serve as both a teacher and a support system for teachers (Suryani, Syahrizal & Fauziah, 2019). Excellent evaluations are being given to Orai, which is also fun to use. Orai is simple to use. One's oratory abilities may be quickly and independently improved. Orai's talents in teaching and studying English are her ability to count the number of words we use and the number of fillers we use while communicating. When using Orai in class, teachers can mix it with other English-speaking topics, such as describing individuals. They can then allow students around 15 minutes to utilize Orai before randomly selecting

students to practice speaking immediately. Lessons, Practice, Progress, and Recordings are just a few of the elements that Orai offers to help students improve their speaking abilities. One can frequently study the primary factors to improve these speaking abilities because they have fascinating information (Salvaris et al., 2018). Those who wish to practice speaking can learn and do so in the 'Lessons' section using the offered information. Before one may study the following lesson's topic, one must finish the first three steps of that content. An app called Orai was created to assist students in becoming better English speakers (Suryani et al., 2019).

### **English Learning Speech Assistant (ELSA)**

English Learning Speech Assistant (ELSA) was created in 2015 by Vu Van and is headquartered in San Francisco, California, in the United States. This application uses AI and speech recognition to improve English pronunciation. ELSA is a programme for learning English that uses speech recognition and artificial intelligence (Zapata-Rivera, Vanwinkle, Shute, Underwood & Bauer, 2007). This technology enables a two-way learning process, allowing users to say specific phrases or sentences, after which the system analyzes them and offers corrected input. In order to identify non-native speakers from most other speech recognition algorithms, the ELSA framework is trained using voice samples of persons speaking English with various accents. A test is administered to users to measure their degree of proficiency. Most native speakers have ELSA ratings of 95 or above, which range from zero to one hundred. ELSA can customize the user's learning route by using the findings to identify compelling sounds that need further adjustment. Based on

the user's current skill level, ELSA will recommend courses they should take next. Regarding the teaching of English and the process of learning it, Application ELSA is an application for learning English that uses AI and voice recognition to assist students in becoming more fluent in spoken English. This technology allows for a two-way learning process; for instance, users may hear how specific English words are spoken or phrases, after which the algorithm analyzes and makes grammatical or structural corrections (Eka, 2020).

### **Chatbot**

The newest technology created to connect with both people and computers automatically are chatbots, one of the AI conversational systems (Nghì, Phuc & Thang, 2019). Previous research has shown the effectiveness of chatbots as a learning tool, particularly for English language learners (Salvaris et al., 2018). The created chatbot application will function as a conversation buddy for English learners and teachers. In general, conversations may be conducted either vocally or in writing, and therefore, the user should be able to practice both. Grammar mistake correction and a daily record feature are required to support the goal of the chatbot application as a tool for English conversation training. The replies received included descriptions of the problems, recommendations for words or phrases to replace them, and locations of the faults. This aims to reduce grammatical mistakes made by the user. Because of this, the daily log feature helps determine how much the user's practice has improved their grasp of English conversation and the structure of sentences. Users get more comfortable with conversational English via this method and receive feedback on their practice and any

errors they may have made. The message the user enters is the first item the fundamental chatbot function analyses. The chatbot and Natural Language Processing (NLP) could decipher the message's meaning by comparing it to the information already included in the database (Haristiani, 2019).

### **Duolingo**

A software application called Duolingo employs a way of learning a language via a game-like format that involves matching words and completing incomplete sentences. This strategy teaches students the syntax, vocabulary, and phrases necessary for constructing sentences. Number of the student's current level of English proficiency, they can utilize Duolingo to teach and learn English while also learning a new science. Duolingo starts by evaluating its users to determine their skill levels and then provides them with teaching materials tailored to those levels. Users of Duolingo who take the exam will get insight into their current level of English proficiency. Duolingo will not make available any English-language content until it has first determined the user's current level of proficiency in the language. In addition to instruction in grammar, Duolingo provides the opportunity to study vocabulary, nomenclature, and various other subjects. The method of education that Duolingo uses to teach English is designed to be similar to gaming and to encourage 'competition' amongst users. The users of this programme will then be able to track their progress in improving their English language abilities.

### **NEO**

The NEO programme, a worldwide system for learning English, was introduced by the California-based English application business Nexgen

English Online Co. Neo is a cellphone-based integrated learning programme that can adjust to the user's learning progress. Thanks to speech recognition and AI. A novel approach to learning English is Nexgen Neo. Neo is an efficient, adaptable, and simple tool for users who lead busy lifestyles. Neo also offers a unique experience for each user with an easy-to-use interface, an adaptive learning system using worldwide Standard English technology, and certifications. The NEO Study application uses AI to continuously evaluate user behavior and data and then give information that automatically changes as users advance. When teaching and studying English, Neo assists users in doing so, quickly than they could. Users of the Neo Study programme may train their powerful voice recognition technology to pronounce each word until they can speak English fluently and correctly.

Using AI systems to learn English according to Eka (2020) has many benefits, including the following:

- 1) AI can do things that are hard for humans to carry out, such as analyzing English down to the phoneme level and recognizing nearly instantaneously how ones' language talents have grown over time;
2. they can be accessed (sometimes even without the internet) anytime and place;
3. AI technology is an alternative that is more effective and easily accessible for learning spoken English;
4. they can assist a much larger number of students and are more scalable than people;
5. since human teachers are becoming more complex, they could speed up the learning process by attaining a higher level of knowledge;

6. those apprehensive about their speaking talents may study in an atmosphere free of tension.

### Conclusion

Robots with an intellect comparable to or greater than that of humans are what AI seeks to create. This complex device's creation aims to shorten working hours, so, tasks may be completed more quickly. Humans can make judgments and do jobs more cheaply by applying AI. With the growth of digital platforms, learning English has become simpler. The usage of AI will grow, thanks to computer and mobile technologies, which will also provide more individuals the chance to become more capable. Digital learning technology also relies heavily on personalized material. We now have an extensive data and artificial intelligence-based adaptive system. We may choose the most effective method of English learning based on each user's requirements and time available.

### Recommendations

The quality of Education ultimately depends on the quality of the learning content. Creating new content requires the wisdom of human content designers and educational experts. To date, AIs have not shown the capability of creating learning content independently. However, they still have plenty to offer in content production by automating mundane jobs and helping humans in tasks where human input is necessary. Specifically, the role of AI should be to take away repetitive tasks that can be automated and assist humans by providing feedback extracted from data during the process of content production in a human-in-the-loop manner.

Three different scenarios stand out in ESL within the framework of technological developments. The first of these scenarios is that there is no

longer a need to learn ESL because communication in a second language will take place with technological devices, human influence will remain in the background. A device will instantly transfer conversations between people from one language to another. The second scenario suggests that second language learning is needed, but the learning method is different. Second language will not be taught in educational institutions with a proper understanding, and it will be learned informally, just like native language acquisition. The last scenario is about learning a second language both formally and informally. The second reminds of the understanding of de-schooling second language learning,. Those who learn through autonomous learning will understand the second language they want to learn online without needing for a school. Undoubtedly, this type of learning method requires learners to have some competencies. Learners should have a developed sense of responsibility, self-control, questioning, interpreting, testing their learning, making decisions, implementation, and self-orientation. Because they no longer have the planning, timing, and evaluation system, they find them ready at school. Learners themselves must create all of these systems. It can be easily observed that these skills are not yet developed in second language students nowadays.

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