



Using Artificial Intelligence in EFL Teacher Education Programs

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Abstract: This article reviews the role played by Artificial Intelligence (AI) in enhancing EFL Teacher Education Programs. It is important to use AI in teaching EFL in general and EFL Teacher Education Programs in particular. It helps EFL Teacher Education Programs in terms of improving the quality of teacher education, enhancing teachers' skills, facilitating personalized learning, access to high-quality educational resources, identifying knowledge gaps, identifying learning styles, adaptive learning and continuous professional development. It is recommended that AI can be used to help qualified EFL precise teachers to cope with this digital era and maximize tending the coming generation which is called “digital learners”.

Key words: Artificial Intelligence, TEFL Teacher Education Program.

Nature of Artificial Intelligence

Artificial intelligence (AI), generally expressed by the general public as the ability of machines or computers to think and act as humans do, represents the efforts towards computerized systems to imitate the human mind and actions (Wartman & Combs, 2018). In this respect, the basic definition of artificial intelligence can be expressed as the skillful imitation of human behavior or mind by tools or programs (Mohammed & Watson, 2019). According to Timms (2016), it may be an illusion of the current structure to think that artificial intelligence will come within the computer format used at home. It could get into our lives within different functions and shapes.

Ng (2017) claims artificial intelligence to be the new electricity of this age. Artificial intelligence is a candidate to be presented as the basic building block of the Fifth Industrial Revolution by providing itself to be a powerful factor in ensuring economic development with its potential (see, Golic, 2019). That could be why investments in artificial intelligence broke a record in China with \$40 billion in 2017 (Mou, 2019). In line with its earnings from AI, China is expected to increase its gross domestic product (GDP) by 26% (\$7 trillion) by 2030. North America is expected to have a 14.5% increase (\$ 3.7 trillion) in the same timeframe (PwC, 2017). These data make the added value and global impact of artificial intelligence more understandable for the future economy, and in our case, for the future of education, which in turn, directs the economy and workforce, paving the way for the new Industrial Revolution.

The in-depth development of artificial intelligence will affect many situations, from the restructuring of the social order in the broadest sense to the education and administration processes in classes and schools. Schools that are expected to adapt to the digital age and embed 21st century skills in their main agendas are

some of the main institutions that could be most affected by the development of artificial intelligence. Karsenti (2019) points out that new forms of technology will fill in our lives and captivate our youth, and this case may leave schools with no choice but to make room for them. In this regard, how the stakeholders from law, business, education, and engineering perceive this development, and how they foresee artificial intelligence in regard to education form the focus of this study. Thus, the purpose of this study is to examine what the use of artificial intelligence in education means and what kind of implication it can reveal for the future of education, according to the opinions of the participants from different sectors.

Brief History of Artificial Intelligence

The term Artificial Intelligence (AI) was coined by John McCarthy, in a famous Dartmouth College Workshop, held in the summer of 1956. The research of artificial intelligence began after the Second World War (Russell & Norvig, 2003). Many engineers started to design machines that have intelligence; that is, to think like what we human do. Alan Turing, an English mathematician, made a speech on whether computers could think independently and possess intelligence. In his book of Computing Machinery and Intelligence, Alan boosted the idea of the artificial intelligence to further research, especially on whether artificial intelligence could have the ability of problem solving.

One of the significant developments was Allen Newell and Herbert Simon's GPS (General Problem Solver), designed to simulate human problem-solving methods (Russell, 1995). During the mid-80s, due to the development of computer networks, researchers started to conduct more practical applications of relative commercial success, such as stock trade prediction and data sorting. Even until now, the research on AI still persists. The dreams of producing human-like intelligence remained from the scientists and researchers (Dreyfus, 1992). With many successful experiments, AI has become popular in various different areas, such as engineering and medical field. Artificial intelligence has now been employed in language teaching and learning and serve a variety of uses for language teaching and learning (Kenning & Kenning, 1990; Warschauer & Healey, 1998). It can be a tutor who offers language drills or skill practice; a stimulus for discussion and interaction; or a tool for writing and research.

Importance of Artificial Intelligence

The rapid development of artificial intelligence technology promotes the innovation of English learning and teaching methods. Teachers have been teaching with the help of multimedia for a long time. Although the classroom is vivid, this teaching method pays attention to courseware explanation and ignores the real-time interaction between teachers and students. Students still passively accept knowledge and have low enthusiasm for learning. The undifferentiated teaching under the unified teaching task cannot get the real-time feedback of students' knowledge mastery, students have little opportunity to learn to apply, and teaching and learning cannot form a good cycle (Jianlin, 2017). Using advanced artificial intelligence technology to make personalized and accurate education possible. Based on big data, artificial intelligence can track and record all kinds of data of learners, model, analyze and evaluate learners, effectively intervene learners, and provide data support for teachers to improve teaching methods and strategies, so as to truly meet the request of teaching (Shouren, 2016).. Artificial intelligence not only changes the way of students' language input and output, which enables students' language learning to penetrate into their daily life, but also plays a significant role in promoting the innovation and reform of English teaching mode. It is a great significance to improve the quality of education to use AI technology better in the complex language environment.

In the field of language learning, artificial intelligence can play its unique advantages. It plays an important auxiliary role in students' learning and teachers' teaching. The application of artificial intelligence

technology in English teaching can give full play to its advantages and make up for the shortcomings of traditional classroom teaching. This paper analyzes the application of artificial intelligence from four aspects of English listening, speaking, writing and translation, and discusses its role in promoting the reform of English teaching.

Listening teaching is the beginning of learning a language and occupies a basic position in English teaching. As an indispensable part of students' English learning process, listening training is of great significance to the cultivation of students' Basic English literacy. However, due to many reasons such as the boring content of listening materials, the difficulty of listening and the inflexibility of teaching methods, students have some fear and resistance to English listening courses. Corpus based English listening teaching can provide learners with a large amount of listening materials. Different difficulties and themes can meet the real needs of many students for English listening. The application of artificial intelligence technology to English Listening Teaching Based on corpus can help students to match learning resources automatically. Artificial intelligence technology can automatically match the listening materials suitable for the students from the corpus, improve the students' interest in learning, and reduce the burden of English listening by analyzing the factors such as students' age, English level and major. Second, students can choose the corresponding English learning materials according to their own interests and their own plans for the future career to conduct in-depth and comprehensive learning. Third, it can realize the interaction between learning and situation. For example, when students scan an object around them, artificial intelligence can automatically recognize and explain the object in English, which realizes the close connection between listening practice and life (*Xiaobing, 2013*).

The application of artificial intelligence technology in English writing teaching is mainly reflected in the correction of English composition content. Firstly, the teacher arranges the writing task in the composition system. The students can write in the composition system after receiving the homework. The artificial intelligence system can provide students with an idea and framework for learning and doing, provide corresponding vocabulary reference in the specific writing, and assist students to complete the task. After the completion of the system for review, students can know their level of learning and doing at the first time, and correct the problems in writing. Through this process, we can help students find out and fill in the gaps in time, and strengthen their writing ability. Such as: correction network. This kind of intelligent teaching platform can give timely and effective feedback to students uploaded English compositions, and make objective evaluation on students' English compositions. (*Jia,2019*).

The system can make a comprehensive analysis of the students' English composition, make a basic judgment on the structure of the students' articles, correct the spelling errors and many grammatical errors in the articles in time, and put forward the modification suggestions in time. Introduce an automatic online correction service tool into English writing teaching, give full play to its advantages of personalization, instant feedback, comment on sentences, online modification, etc., let students have fun in writing in the process of multi manuscript modification, realize self-exploration and self-innovation construction, enhance their sense of self-efficacy in writing ability, and improve their motivation and writing ability. Teachers can use the system's automatic feedback mechanism to make manual secondary correction and make further teaching feedback. Teachers can also master students' learning situation and implement curriculum improvement at any time according to the formative assessment report given by the system, which is of great significance for improving teaching methods and realizing the upgrading of teaching system. (*Xiaoqiong, 2015*).

The ultimate goal of oral English learning is to achieve fluent communication. The level of students' oral English expression can fully demonstrate their practical English application ability. Therefore, the introduction of artificial intelligence technology into English teaching has obvious advantages. First, it can realize the accompanying practice. Artificial intelligence robot can create English learning environment for

students and communicate with students like partners (. Through human-computer conversation, not only can we avoid the embarrassment in practice, but also can improve our oral English level quickly. Second, teachers and students can practice in groups by remote way to achieve group learning in holidays. Intelligent robot can act as a teaching assistant, providing some sentence patterns and fixed collocations for practice activities, which is convenient for group members to practice. In this process, the tension between students and real people can be fully and effectively relieved to help students practice and improve their oral English fluency. In today's oral English teaching, we should promote the in-depth promotion of robot teaching and realize the full and effective development of oral English teaching. This has a great role in improving students' English ability (Kaiquan, 2017).

Artificial Intelligence in Education

Roll and Wylie (2016) highlight Henry Ford's quote, 'If I had asked people what they wanted; they would have said faster horses.' On the surface, it can be said schools have become 'faster classes' that produce results in a shorter time. But, will these 'fast classes' continue to do so or require thinking differently in the 21st century? As we go towards the 22nd century, is it sufficient to provide skills, critical thinking, and metacognition skills? Or should we configure new systems that have never been thought of before for the new age? What opportunities can artificial intelligence offer in education that will differentiate people from robots or smart vehicles and help humans keep their emotional and social aspects? Most probably soon, these topics will be the main agenda of policymakers and implementors in the field; actually, there are already discussions asking if AI can truly replace teachers or not (Felix, 2020).

Manyika et al. (2017) emphasize that good teachers will continue to exist in the future, teaching classes designed to boost students' affective intelligence, creativity, and communication. In fact, according to these authors, developments in artificial intelligence and automation will actually make 'people more human.' While addressing educational research on artificial intelligence, Haseski (2019) briefly states the results of these studies as follows: the use of artificial intelligence in education will make learning more individual, provide effective learning experiences, enable students to discover their talents, improve their creativity and reduce teachers' workload. That being said, there are opposite ideas as well. Transferring the roles of teachers to computers is seen as a danger in the studies on artificial intelligence (Humble & Mozelius, 2019). To prepare for this future, the task of states and nations is to create a teacher profile that will work with these support structures (Wogu, Misra, Olu-Owolabi, Assibong & Udoh, 2018).

Although artificial intelligence studies in education have attracted a lot of attention in recent times, studies about the theory of general artificial intelligence can be traced back to at least the 14th century, and these studies remerged through the work of Alan Turing in 1937 (Humble & Mozelius, 2019). They are now becoming an important point of academic literature and scientific circles. We see extension of AI studies in organizational management as 'artificial intelligence leadership' has begun to be discussed in the literature (Canbek, 2020).

With more usage of artificial intelligence in education, major transformations can be foreseen in the education systems and its processes. Based on the study results, Sekeroglu, Dimililer & Tuncal (2019) stated that artificial intelligence could help teachers improve personalized education for their students. Artificial intelligence can provide access to appropriate and better learning opportunities for excluded people and communities, people with disabilities, refugees, people out of school, and those living in isolated communities (Pedro, Subosa, Rivas, & Valverde, 2019). Research shows how effective individually tailored approaches can be presented with the support of artificial intelligence techniques and intelligent learning environments (Mohammed & Watson, 2019). Although quality education seems to require the active participation of human

teachers, artificial intelligence envisages increasing education and quality at all levels, especially by providing personalization (Grosz & Stone, 2018). Pedro et al. (2019) highlights a dual-teacher model with artificial intelligence in terms of individualized education: teachers spend a lot of time in routine and other administrative tasks, such as repeating frequently, answering questions about many topics, but in-class artificial intelligence-supported assistants (secondary teachers) will reduce the time spent on routine procedures, which will help teachers focus on student guidance and one-to-one communication.

Nature of Teacher Education Programmes

Teacher education programmes can be defined as the practices, strategies, and policies that prepare teachers with the professional knowledge, teaching skills, evaluation techniques, and ethical orientations needed to effectively perform their teaching activities in order to contribute to the development of society (Oyekan, 2000). Teacher education is usually considered to have three phases—pre-service, induction, and in-service—all of which are part of a continuous process (Dunkin,1987).

Teacher education programmes mean both the basic and foundational teacher education oriented towards pre-service teachers and continuous teacher education oriented towards in-service teachers who receive professional development training. Regarding the use of technology, most teachers now recognize the importance of technology in teaching and learning activities. Thus, teacher education programs integrate technology in different ways within the classroom or via online courses—for example, by employing social media, blogs, web conferences, and discussion forums. However, the integration of technology into courses is still difficult due to several factors, such as the school culture, availability of resources, and teachers’ attitudes, knowledge, and skills [8,9]. Nevertheless, governments around the world are implementing policies to bring technology to classrooms, as it is becoming an essential component of the education system . Therefore, teacher education plays an important role in developing teachers’ knowledge and skills related to the use of technology in the classroom (Butler, et al, 2018).

With the gradual integration of information technology and education and teaching, the innovative application of education informatization has brought new opportunities for teacher evaluation and professional development. Artificial intelligence appeared to simulate teachers’ intelligence and capabilities. Thus, it becomes clear that artificial intelligence seeks to build their intelligence to the degree which means understanding this insight, (Qandil, 2016).

Role of Artificial intelligence programmes in teacher Education



Improving the Quality of Teacher Education

AI can play a crucial role in improving the quality of teacher education. Artificial intelligence is becoming an integral part of smart ICT based apps targeted for digital learning in India. (Importance of AI in Improving the Quality of Education in India - India Today, n.d.). One of the significant challenges in teacher education is ensuring that teachers have a strong foundation in the subject matter they teach. AI can provide teachers with access to high-quality educational resources and learning materials that are tailored to their individual needs. AI can also help teachers identify knowledge gaps and provide feedback on areas where they need improvement. Teachers can seek the help of AI to improve their teaching skills. Below is a comparison between the search result for the statement “ways to improve teaching skills” on both Google and open AI ChatGPT.

Enhancing Teachers' Skills

AI can also enhance teachers' skills by providing them with access to a range of tools and resources that can help them become better educators. For example, AI-powered assessment tools can provide teachers with real-time feedback on student performance, enabling them to adjust their teaching strategies to better meet the needs of their students. AI can also help teachers to personalize learning, creating lessons that are tailored to the individual needs of their students. Educational Institutions like the Kendriya Vidyalayas that follow CBSE syllabus have already introduced AI to their students. Humanoid robots are assisting teachers in the classrooms at Indus International School, Hyderabad. (Nataraj, 2022) Many schools that follow IB curriculum have already taken the initiative and introduced AI as a part of the newly introduced robotics subject.

Facilitating Personalized Learning

AI can facilitate personalized learning by providing teachers with access to a range of tools and resources that can help them create personalized learning experiences for their students. AI has the potential to enrich student's experience (Qadir, 2022). For example, AI can help teachers to identify students' learning styles, interests, and abilities and use this information to develop lessons that are tailored to each student's individual needs. AI can also help teachers to track students' progress and adjust their teaching strategies accordingly. “A personalized learning environment can analyze student performance data in real time and automatically provide customized content, learning parameters and feedback. It also allows teachers to better understand student performance and as a result, teachers can design effective learning plans for their students”. (Wadhwa, n.d.).

Access to High-Quality Educational Resources

One of the most significant challenges in teacher education is ensuring that teachers have a strong foundation in the subject matter they teach. AI can provide teachers with access to high-quality educational resources and learning materials that are tailored to their individual needs. For example, the Global Teaching Insights Report found that many teachers in developing countries face significant barriers in accessing high-quality educational resources. But post pandemic the scenario is rapidly changing. The ‘ICUBE 2020’ report by IAMAI and Kantar indicates that the usage of internet which is pre requisite of adopting artificial intelligence continues to grow in India. It is stated that the number of active internet users are expected to grow and reach 900+ Million by 2025. (KANTAR_ICUBE_2020_Report_C1. Pdf, n.d.). AI can help bridge the gap by providing teachers with access to a range of educational resources, such as online lectures, educational videos, and e-books.

Identifying Knowledge Gaps

AI can also help identify knowledge gaps and provide feedback on areas where teachers need improvement. By analyzing teacher performance data, AI systems can identify areas where teachers may need further development or support. This information can then be used to create targeted professional development programs that help address those gaps.

Identifying Learning Styles

One of the critical aspects of teacher education is to develop teachers' skills in identifying and catering to various learning styles of their students. AI can help teachers to identify students' learning styles and provide recommendations for adapting teaching methods. For example, an AI system can analyze data on how a student interacts with an online learning system to infer their learning style and recommend instructional strategies that cater to that style.

Adaptive Learning

AI systems can provide adaptive learning experiences that cater to the needs of individual learners. Adaptive learning is a teaching method that uses AI algorithms to adjust the difficulty and complexity of the learning content to match the individual's learning pace and ability. By using AI to personalize learning, teachers can help students develop more significant mastery over the subject matter and improve their learning outcomes.

Continuous Professional Development

National Educational Policy 2020 has emphasized on the professional development of teachers. AI can provide opportunities for continuous professional development for teachers in many ways. For example, AI systems can provide feedback on teacher performance, highlighting areas where they may need further development. Additionally, AI systems can provide recommendations for professional development opportunities that are tailored to the specific needs of individual teachers.

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