Artificial Intelligence Applications in English Language Teaching: A Short Survey

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ABSTRACT— ***Artificial intelligence is one of the most popular and influential sciences in many fields. It works continuously to contemporise computer systems to operate with high efficiency and to think like what a human think. In addition, this science seeks to make the work of the machine simulate the work of the human brain in thinking and making decisions, according to the environment in which they live. Therefore, it has become necessary to have artificial intelligence applications in all areas, including education, especially the English language teaching electronically. In this regard, the most influential applications and programs that contribute to the development of teaching English electronically and their effectiveness in developing e-learning will be reviewed. This article concluded that there are applications of artificial intelligence in teaching English electronically, which are of great importance and a great future in the development of language teaching.***

Keywords—Artificial Intelligence, English Language, Teaching, Machine Learning.

1. INTRODUCTION

Artificial intelligence is highly capable digital systems that perform tasks that typically require human intelligence in their design [1]. This means that tasks can be automated, and people can be supported to make practical decisions that contribute to the growth of working life [2][3]. In addition, artificial intelligence has a lot of science fantasy stories, and it is often portrayed as being part of dystopian societies that may lead to the extinction of humanity and the control of life by robots [4][5]. In fact, artificial intelligence helps humans in many areas, including medical, military, space, teaching, and others, and not as some imagine that this science is world control. It also helps us find the shortest route when we travel or select films on *Netflix*, *Amazon Prime*, and other applications. Other instances of artificial intelligence range from trajectory planning, by controlling construction machinery, to allowing industrial robots to see. Also, artificial intelligence utilises advanced analytics and algorithms, including machine learning, to interpret events, support and automate decisions, and take action.

Data processing is a necessary step for success with artificial intelligence technologies [6][7]. Sensors and the Internet of Things are utilised to collect smart data from the practices of individuals from different societies. Algorithms are used to get meaningful effects from this data. To create algorithms, machine learning is favoured, which has the ability to develop intelligent algorithms capable of accomplishing excellent and wonderful assignments [8][9]. Artificial intelligence has an artificial neural network algorithm that simulates the human brain and enters into our applications deep fake that creates fake and unreal content, which is the most amazing idea that occurred in the last twenty years. Figure 1 simplifies how the process of switching the destination and creating a non-real character is done using the encoder and decoder. In short, artificial intelligence can be manufactured according to the desire of specialists. Still, it uses many valuable areas that serve humanity and helps achieve more acceptable effects and excellent accuracy in completing tasks.

Machine learning algorithms fall into three varieties:

- **Supervised learning** allows training of an algorithm based on the data collected as the relationship between condition and outcome is known. The trained algorithm can then help you predict the results. When similar conditions occur again it can continue the prediction process and give better results than before, for instance, recognising objects in images or predicting heart disease (see Figure 2).
- **Unsupervised learning** is utilised to recognise patterns and predict behaviour without algorithm training using so-called training data. This is used to group individuals or observations in order to then be able to predict behaviour based on group affiliation. For illustration, unsupervised training can predict client behaviour and determine what they like or want (see Figure 2).

- **Reinforcement learning** provides the algorithm the opportunity to come up with different proposals for solutions, and then gradually learns how well it is succeeding in achieving one purpose or another. This is especially useful in game-like situations, with clear rules and objectives. Again, this contribute to determining the most suitable solution to a problem from a large number of possible solutions.

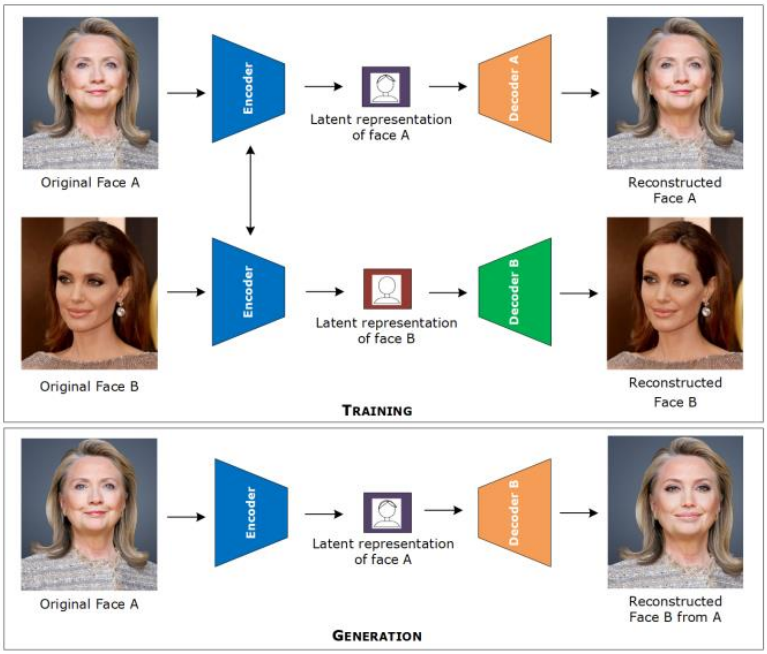

Figure 1: Creation of a Deepfake using an auto-encoder and decoder [10].

As a society, it is important that we engage with the ethical considerations around the use of artificial intelligence. At the same time, artificial intelligence is part of the solution we need to build a more sustainable society. We must not delay developing solutions that create value. The use of artificial intelligence in the health sector can have a significant and important impact in saving human health [11]. Also, artificial intelligence plays an important role in the fight against COVID-19 pandemic [12][13]. The main purpose of this article is to see the importance of artificial intelligence applications and how they contribute to the development of the process of teaching English online.

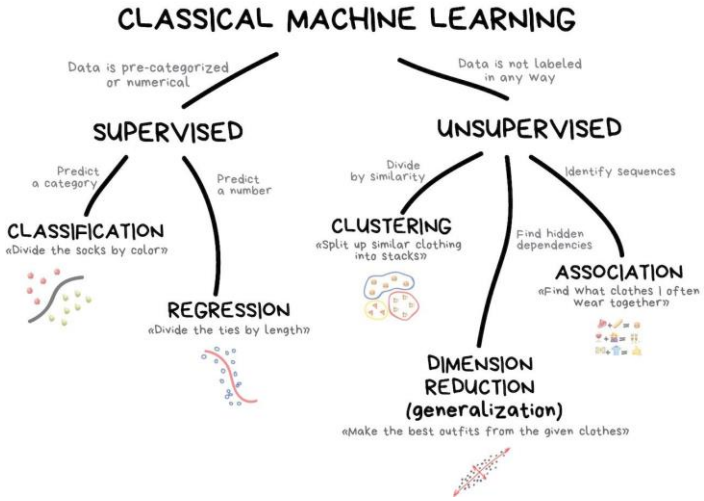

Figure 2: An easy summary of the machine learning classes (supervised and unsupervised learning) [14]

2. ARTIFICIAL INTELLIGENCE APPLICATIONS

This section will address the most influential applications of artificial intelligence and how they are used in many areas, where they will be briefly described. Artificial intelligence has many applications that contribute to the service of humanity, as well as contribute to the selection of the most important solutions to complex issues and assist in decision-making. The most influential applications of artificial intelligence are:

- Artificial intelligence is characterised by the fact that it can be applied to various devices and machines and can be used in analysing issues and utilising logic. It uses mathematical algorithms to accomplish the analysis and planning tasks to build proper decisions [15][16].
- High ability to distinguish sounds and speech, such as recognising natural sounds, the cheers of the masses in the stands, and distinguishing people's voices [17][18].
- This science helps learners through continuous learning and e-learning. These applications are characterised by assisting the learners in finding the study material skilfully and accessing any matter they want without worrying [19].
- It has a significant role in processing and classifying information and data, regardless of its size. The greater the volume of data (Bigdata), the more influential the ability of artificial intelligence to gain and find more acceptable solutions [20].
- Artificial intelligence always seeks to notice similar patterns in the data while seeing the most appropriate ways to analyse it more effectively and better than the human brain [21].
- It is characterised by the ability to find solutions, as machine learning has many algorithms that contribute effectively to finding solutions employing cognitive abilities [22].
- Artificial intelligence uses logic, knowledge, planning, and hypothetical awareness to analyse data employing various intelligent techniques [23].
- Artificial intelligence techniques are applied in various fields of industry by relying heavily on robots to complete the required jobs, for instance, in the automotive industry [24].
- Designing computer software in various fields such as engineering, medicine, educational sciences, commerce, economics, sustainable development, cybersecurity, and many others [25].
- Artificial intelligence has high capabilities in describing and classifying data. For instance, it has penetrated the medical field in diagnosing and predicting diseases and assisting doctors in determining the patient's condition. In addition, it contributed to monitoring the spread of COVID-19, deciding cases of infection and death in all nations, and contributing to the vaccination industry [26][27].
- Artificial intelligence is penetrating the industry of self-driving cars (autonomous) or drones, where AI can fly a plane and reach specific points without the presence of pilots in it [28].
- Artificial intelligence is involved in scientific research, as it provides an electronic environment for cooperation between researchers at different times and places.

Through the above points, it is clear that artificial intelligence is an important and vital part that cannot be dispensed with, as it is necessary for the processes of data analysis and decision-making with high accuracy. Many applications of artificial intelligence are being developed on a daily basis and at a tremendous speed, as there are millions of devices and machines that are widely utilised by millions of people in the completion of their work. Figure 3 illustrates the significance of artificial intelligence applications.

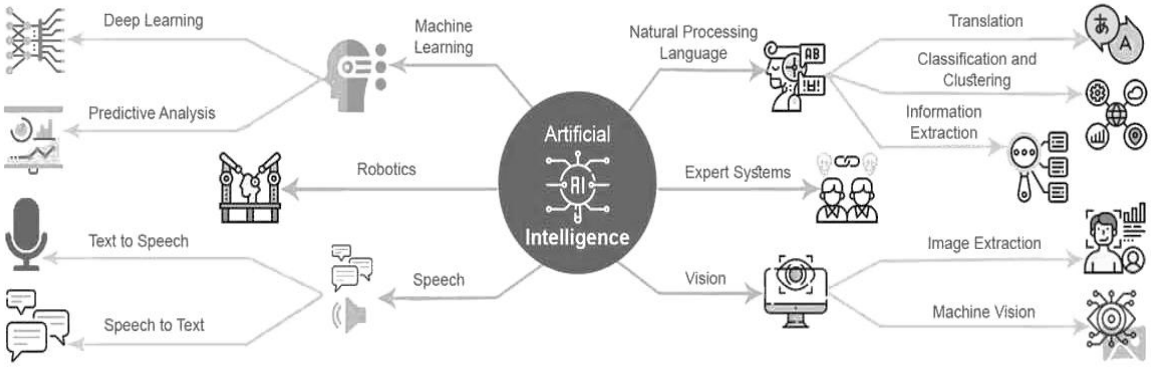

Figure 3: Artificial Intelligence Applications [29].

3. AI IN TEACHING ENGLISH

All workers in the teaching sector agree that the future of learning the English language depends on keeping pace with the development of modern applications and new devices and the revolution of information, electronics, and communications. The English language significantly requires the use of applications dedicated to language teaching. Many people wish to learn English and speak it fluently. There are many applications that support the idea of teaching English, as these applications that contribute to the development of learning the English language are a lot of

downloading. Still, they are exhausting as they support ads and are not used. The relationship of language with a computer and smart devices is mutual, as the computer is used to create linguistic models, analyse its branches, and create applications that contribute to the dissemination and teaching of the English language. The computer is characterised by the ability to develop educational dictionaries in a variety of forms that are straightforward to understand and apply by recognising and distinguishing letters as well as words (see Figure 4). In addition, it is characterised by storing materials, books, and explanations and arranging them according to the user's desire, with the possibility of retrieving the contents, modifying them, deleting them, or obtaining part of them. In short, the computer is a necessary way for every teacher to study English in a modern, fantastic and easy way, as it makes the learner not get tired of the lesson, use the language correctly, and quickly gain experience in the process of learning the English language.

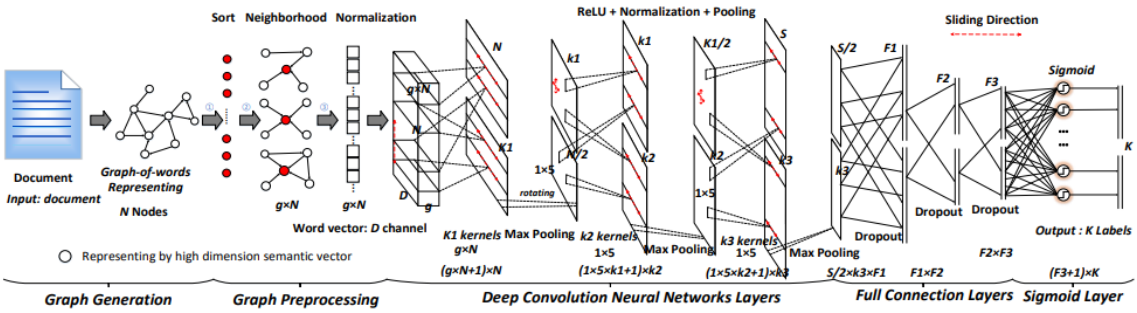

Figure 4: Diagram illustrating artificial intelligence techniques in text classification [30]

The focus is on three primary axes in the growth of the educational process: the teacher, the learner, and the educational material, whether in a physical or virtual environment, as the teacher must rely on the use of computers and techniques in teaching the English language in high quality. Thus, the learner will access the words and sentences perfectly and accurately. In other words, the applications assist teachers in communicating their notes to the learner in a sequence, provide feedback, and make them acquire full knowledge of English grammar and literature. Therefore, teachers must have full knowledge of computers and applications and use programmers to create applications that work on smartphones that contain complete English language learning without a teacher and ads. Moreover, modern technologies have contributed since the COVID-19 pandemic. The world's tendency to use e-learning and its success has forced many workers in the field of education to have experience in using computers and educational applications in order to deliver the scientific material correctly and adequately to the learner, where language is taught English requires a great effort to give it to the learner, as the process of creating an electronic scientific subject requires time and effort. . Therefore, the teacher must be given an opportunity to acquire the skills and abilities to manage classes electronically.

Today, the world lives fast with applications and intelligent devices, and we must concentrate on them continuously and take advantage of them in teaching and making lectures electronically. Also, through these applications, the learner can communicate in sound and accurate English in various life situations faced by an employee, all the skills he/her has acquired in language use, reading and writing, whether in a physical or virtual class. The computer does not differentiate between the two classes, as both are in the same environment for it. Therefore, it is preferable to have computers with the teacher when entering the lesson and to use programs to prepare lectures in an effortless way to understand and apply. The last two years have witnessed tremendous developments in the field of education and the emergence of e-learning in colleges, universities, and even schools and institutes. As a result, it has become vital to use artificial intelligence applications in giving lectures. Therefore, the computer is significant in teaching the English language and continues beyond what we have mentioned. Still, it goes beyond it to other capabilities and opportunities, such as openness to the experiences and cultures of others.

4. CONCLUSIONS

Artificial intelligence is the science that aims to create smart applications and algorithms that contribute effectively to assisting make the right decisions. Also, artificial intelligence helps those working in the education sector to teach scientific subjects in a smart and easy-to-understand way and to disseminate them to learners. This article concluded the necessity of holding training courses in teaching the use of modern electronic programs and methods of their performance. The necessity of introducing computers and electronic devices into all educational institutions, training on them, and utilising them in teaching the English language. English teachers should be aware of the latest applications that are applied in language teaching. It is necessary to encourage the production of a set of scientific papers on the challenges and difficulties that English language teachers face. The continuous endeavour to employ the computer in developing English language curricula. In addition, designing applications that work on smartphones publish the English language professionally, efficiently, and without ads. In the future, more studies will be conducted on the importance of artificial intelligence in other areas of life.

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