



Artificial intelligence applications and tools in higher education
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Abstract: Today's world is rapidly evolving in various fields, where the use of AI technologies in manufacturing or service delivery is not limited to improving and developing education as a method and tools. Education is one of the areas in which AI applications are increasingly used and possesses a broad horizon for future development.
Keywords: intelligence, artificial, tools, education.

I. INTRODUCTION

AI improves and develops education by providing tools and applications that help learners as well as teachers improve their educational capacity in better ways, at greater scale and at lower costs, thereby achieving effective outcomes for all school age groups. How is AI used in education? What are his most important tools?

1. AI concept:

Initially, the concept of artificial intelligence is made up of two words, artificial intelligence, so intelligence can be defined as the ability to learn, adapt, flexibility and act. Attitudes, problems and thinking about relationships must be constructive and purpose-oriented. While the word artificial or industrial is actually related to making things as a result of the activity or act it does. Thus it can be said that artificial intelligence is made by man but human intelligence is the making of God Almighty.

2-There are several definitions of artificial intelligence:

.1John McCarthy's Definition (1956) John McCarthy: Artificial Intelligence is the Science and Engineering of Making Smart Machines

.2Winston Definition: (1992): Artificial intelligence is the study of mental abilities through the use of computational models.

.3Definition of Fahad Al Qasim (2017): Artificial Intelligence is the study and design of intelligent customers as the intelligent client is a smart system, it is a system that recognizes its environment and offers actions that increase the chance of success in achieving its goals.

Definition of Mr. Karima Mahmood's names (2020): AI is one of the subcomputer sciences that is interested in creating physical software and moons capable of simulating human behavior.

In the light of the above, AI can be defined as a science and an important area in the life of the individual, organization and society, which aims to provide smart software and a smart machine industry to do things and works similar to that of man, with the aim of making life and work better and easier and less expensive.

3 _Characteristics of artificial intelligence:

AI has many characteristics that have made it an effective investment in many areas as follows:

AI applications on devices and machines enable them to plan and analyze problems using logic.

Recognizing sounds, speech and the ability to move things around, AI adopters can understand and analyze inputs well to deliver outputs that meet the user's needs efficiently, enabling continuous learning where the learning process is mechanical and subjective without being monitored, and supervising the tremendous amount of information he is exposed to can observe and analyze similar patterns in data more

effectively than human brains can find solutions to unfamoral problems using his abilities.

4_The importance of artificial intelligence:

AI has invaded a number of areas of life and work, including finance and business. For example, it cares about the cognitive processes that man uses to perform the work that he prepares intelligent and correct to improve performance in the future. AI has certain behaviors and characteristics that make it mimic human mental abilities and patterns of work.

Artificial intelligence refers to systems and devices that mimic human intelligence, not the function that it collects. In addition, it has the ability to think super and analyze data more than it does in a particular way or function, also artificial intelligence is to study how to make machine computers create better than humans do right now. Although AI provides images of high-performance, human-like robots dominating the world, but it is not intended to replace human beings substantially, making it a very valuable asset of business.

5 Artificial intelligence in education:

If the idea of creating smart machines and artificial intelligence goes back - as passed from us - to at least the 14th century, artificial intelligence in education) (AIED) is a modern specialty that, since the 1970s (2022Humble & mozelius), has benefited greatly from several achievements in new information and communication technology that have had an impact on its knowledge and professional environment. Collaborative work with AI systems is required in several areas, including education.

Historically, it seems that the first artificial intelligence program developed in the field of information technology was in the 1950s, and it was in the 1950s. It was a logical theoretical kind in the field of informatics in general, because AI in education seemed like a kind of applied curiosity by computer scientists, But it has gradually shifted to more specialized software and has made a strong impact in the field of education and especially the smart teaching system environnements informatiqu pour l apprentissage humain intelligent tutoring.

6.The most important developments in the use of artificial intelligence in the education sector:

The use of artificial intelligence in education (IAIED) is a thriving area in terms of the effectiveness of its applications The International Society for Artificial Intelligence in Education (IAIED) was founded in 1977 and sponsored the publication of the International Journal of Artificial Intelligence in Education (IJAIED). The following will be presented as facilitated by the artificial intelligence applications in the field of education in the form of applied classifications, with some indicating that the elements overlap:

The compilation of several studies showed four applied areas in academic support services and institutional and administrative services in the education sector: Profiling (profiling/profiling) and forecasting/prediction, assessment and evaluation, and adequacy and personality systems, and smart education systems. This was especially done by researchers from America, China, Taiwan and Turkey and with limited contribution from researchers with educational background for their part, Lukin and others describe three types of AI software that have become available in the field of education: Personal teachers, smart support for collaborative learning, smart virtual reality.

The answer to my question is what? During, for example: deep learning software), how?

For example: S.A.M.R compensation/increase (add)/modify/redefine...)

This is in order to improve the answer to what we know, how we know, and on their bilateral side (baker & smith) applications of artificial intelligence in education (AIED) to three groups: learner-oriented, teacher-oriented, and institutional system-oriented.

Padilla referred in his article to three curricula that began to affect the composition in the education sector:

_ Chabot: Tools that serve as students' teachers in virtual learning environments s responses ", which are useful in creating conversations and in conducting automatic and adaptive assessments of the responses of other students, Even with open texts, the application of automated education has the ability to create predictive models of answers to the questions drafted, Thus, scrupulous and reformulated questions to build new information nodes, the machine learning derives from statistical learning methods and uses data and algorithms to perform the tasks usually performed by humans using computers.

On the other hand, widely known AI applications such as recommendation systems or facial recognition and predictive analysis have become, Face recognition software is used to capture and monitor facial expressions for students These systems provide insights into students' behaviour during learning processes and allow teachers to intervene and take appropriate action. These include developing learner-centered practices and increasing their participation. Predictive analysis algorithms are used primarily to identify and detect learners' patterns based on analysis to detect university students at risk of failure or failure to complete their education, allowing teachers to intervene and provide students with the help they need.

_ Create online self-learning platforms such as Siri siri or Google Assistant....

_ Educational robots: are simple machines used inside and outside the classroom to perform tasks that meet users' needs, with the contribution of both sides of the educational process: teacher and student....

As for Huang and others, the past decades have produced several studies on the use of "artificial intelligence in the education sector" (AIED) that can be classified according to the nature of the target role index into four roles (smart teacher, smart education, smart learning tool or partner and policy-making consultant):

_ Smart Teacher: May represent a large volume of AIED applications, including smart education systems, adaptive/personalized learning systems or recommendation systems. Examples of basic smart education systems include "Cognitive tutors", who analyze the effects of learners and visualize a diagnosis of their knowledge and "automatic teacher" (Auto Tutor) which supports the learning of certain subjects, computer literacy and critical thinking. The most recent example is "supportive", which combines the advantages of smart education with evaluation to provide real-time feedback to students while addressing duties and providing data-supporting reports to clients on each school duty.

_ Smart Education: The Smart Education Systems application "ITS" refers to JASOP programs designed to integrate AI technologies to provide teachers (Smart) Know what they teach, who they know, and how they know, these smart systems can determine the course of learning and choose and recommend learning content for students and provide scaffolding Pillars) and help engage students in dialogue and simulation of individual education, thus smart education systems have tremendous potential to support education and learning, especially in large-scale tele-education institutions, and thus run teaching materials with thousands of students, where human individual education is difficult or impossible.

It should be noted here that this type of education is a rare applied category since most AI-based educational systems generally focus on helping learners, rather than providing opportunities to encourage learners to work as teachers or counselors. However, involving learners in texts, helping others "AI students" on understanding complex concepts can be an excellent approach to enhancing their higher thinking competencies and knowledge levels. For example, smart education can be a conversation robot with which learners can interact, or a well-developed Robert and teach him by providing training examples on a particular topic, so he can then answer questions about the subject.

- Smart learning tool or partner: from this student-centred learning perspective, Providing an intelligent learning tool or partner is an important issue. It can help learners to collect and analyze data in effective and effective ways. and enabling them to focus on critical points or higher thinking, rather than low-level tasks such as editing and calculation And some tools can analyze and present data in a smart way to help learners think deeply and find the implications behind the data, For example, traditional thinking tools, such as concept mapping, help learning to regulate knowledge by linking relationships between concepts in a negative way, Conversely, a smart concept mapping tool can clarify or provide hints to learners in addition to evaluating the maps of the developed concepts during their drawing process.

-Policy-making consultant AI techniques have been used in information and guiding policy and law development in recent years. It is possible and glorious to build policies in education, because AI technologies help policymakers understand trends and problems more accurately in educational environments from macro and micro perspectives, which can help them build and evaluate effective educational policies.

Finally, it is worth mentioning what Goksel, Bozkurt states about the fact that the scope of artificial intelligence is broader and that its future will probably be of three applications: natural language processing, higher education, and deep education, which are valid, but are invested in developing them and developing branches of them because they are promising in the field of education.

7_Assessment of the use of artificial intelligence in the education sector:

References specializing in the evaluation of the relationship of artificial intelligence to education mention several evaluative indicators and different names: pros, cons, benefits, strengths opportunities, weaknesses, challenges, threats, fears, risks, borders... The evaluation process will be adopted through the analytical matrix, S, F, T, swoc, which took the original name in English (swot) of the first letters of the analytical elements reagents, foreges, weinesses, forts, thungations, and forts.

Of course, the traditional method of evaluating content can be adopted only by presenting the elements of negatives and pros, or by adopting a more accurate presentation containing the four elements of the above-mentioned analytical matrix (strengths, weaknesses, opportunities and challenges). The second option, as mentioned above, was adopted through a general review of some of the specialized literature that addressed the subject of application of artificial intelligence in education.

Strengths: The presentation of developments in the use of AI in the education sector in the former component indicates that its strengths/benefits/advantages are numerous, including:

_Educational intelligence applications help achieve the goals of individuals (teachers and learners) and educational institutions, because they are considered a factor for learning natural language and help to evaluate teaching and learning efficiently, especially in the fields of STEM education and languages. However, rapid progress in machine learning using the deep neural network in artificial intelligence, is not at the same level in all disciplines.

_ Personal learning systems, also known as adaptive learning platforms or smart learning systems, are considered One of the most supportive synthetic applications for students and teachers, it provides students with access to different teaching materials based on their individual educational needs and themes. For example, Comparing students' scores in tests, research shows that education based on personal learning systems resulted in higher grades of choice than traditional teacher-led education.

Microsoft's 2018 report on more than 2,000 students and teachers from Singapore, the United States and Canada shows that artificial intelligence supports students' learning progress.

_The Insight Analysis website states that learners can use AI to complete puberty, including administrative work, evaluating learning models, dripping test papers, responding to general inquiries, and by the same site eight ways to use AI in science:

- _Preparation of lessons and lectures.
- _Providing in-person learning.
- _Enabling comprehensive access for learners.
- _Identify the citizens of the lectures that should be improved.
- _Perform automated, automated, routine tasks,
- _Support in education.
- _Promote virtual learning.
- _Create smart educational contents.

_2weaknesses:

In an earlier element, we mentioned the adverse repercussions of the use of AI in general, which in fact encompasses most sectors of society, and we see here those related to the education sector:

_Threaten the careers of teachers and administrative staff in this sector, undermine pupils' construction, analytical and creative abilities because they are more dependent on certain AI applications and provide some applications that are not suitable for pupils in scientific and ethical terms.

In addition, with regard to weaknesses related to certain applications, many AI systems in the education sector have been designed with a low degree of intelligence and sometimes at some level can be called stupid teaching systems. It has also been observed that AI generally has its own limitations, such as the bias of aggregated data and the bias of its application algorithms.

_ On the other hand humble humble, the use of artificial intelligence in educational processes generally focuses on the execution of tasks without clear thinking or strategies, And without specific educational context or goals. This is due to several reasons such as the constant demand to use it because of its existence or because of the institutional pressure to do so. Also to the fact that many AI tools are not designed for educational purposes, they require non-standard adaptation and use to their original purpose. This means that there is no natural integration and they are used simply because they are attractive or new. Education ", usually implemented

using behavioural curricula focusing on content education rather than learner. To avoid some of the disadvantages some schools have taken against this type of artificial use: strict action, such as prohibiting or restricting access to catgut on school networks and computers, in order to avoid negative impacts on students' learning and provocation of content reliability.

Others also suggested asking pupils to write texts in school or use modern references, because before March 2023 the chatGpt system used only references 2021, so students could be impeded by requesting references starting in 2022, but the effectiveness of this procedure was in effect before the identification of the AI robot that has come to use data

There are also those who have called on teachers to use the detector. The problem is that AI is progressing faster than the detector, because IT developers, as expected, are focusing their efforts more on improving AI so that it is renewed before the detector and supplying it with detector deception.

In contrast, there are suggestions to adapt to this common numbered reality - in order to improve academic performance - and recommend introducing new AI technologies into the classroom, by assigning classes to teach how to make use of AI for everyday work or group projects where you try to maximize the potential of this tool.

It is also suggested that teachers use educational strategies adapted to these developments such as reversed learning, an educational approach in which educational content is delivered outside the classroom and face-to-face time _ attendance education _ to develop targeted and personalized educational activities in place of the traditional way in which direct guidance is provided in the classroom and practice activities are assigned at home. This will save time in the classroom for more important learning activities, such as discussions, exercises, laboratories and projects, and encourages cooperation among students.

While noting that there were some features of adaptation that seemed especially to be used by language education programs: Duolingo, Babel, Lingvist or Gymglish, which have come to benefit extensively from AI techniques in order to customize each student's learning pathways. It is what trends advanced conversation robots such as ChatGpt by providing a robot professor to teach all student

.-Opportunities:

In the context of the proposals mentioned at the end of the preceding component, the most important opportunities for the use of artificial intelligence in future education are presented below:

- Teachers should realize that AI applications are only tools with rich and innovative communication capabilities, so they can be used intentionally and strategically to support learning processes. They should also know that the development of their

students' potential can be targeted through the use of AI, and can be monitored with conscious planning capable of making real transformations in the education sector.

Some studies in this area (humble) have found that there are many opportunities available in the field of the use of artificial intelligence in education, such as the possibility of supporting teachers and students in more customized and adapted educational environments. For example, smart solutions can facilitate students' learning.

Since AI, systems are able to perform certain tasks for students; the teacher's interaction with his or her students must change to fully harness the potential of technology. His or her role remains essential, but with more emphasis on guiding and overseeing the learning process of students, and strategically utilizing technology to improve education in an innovative interactive context.

On the other hand, the teacher must act as a mediator and regulator of the teaching process and interaction with students, defining objectives, regulating content and promoting cooperation and participation. Of course, the interaction between teachers and students should not be limited to a particular time or place, where the student manages his or her study time and reaches the subjects at the appropriate time.

Within this dynamic, there are different ways of what a teacher should do in the interaction between students and artificial intelligence to improve learning.

The crucial role is to oversee and guide students' work with AI, and ensure that it is used appropriately and is in line with the objectives of learning and academic standards. The teacher must also continue to provide personal interaction with students to help them learn.

It should provide a broader context for students' work with AI which helps them to understand the purpose of the tasks and how they relate to educational materials, It is important to enhance students' creativity and thinking by encouraging them to think critically about the work they do using AI. Teachers should teach students how to use AI critically and distinguish accurate and valuable information, while avoiding bias and misinformation.

One of the most important tasks of the student when working with AI is to know how to assess the accuracy and usefulness of information generated by AI. This means developing basic skills to evaluate the information generated by AI and compare it with other sources of information, in order to determine its formula, relevance and value to the learning process.

Most important are the skills required in this field: analytical skills to analyze and understand large amounts of data, understand how AI technologies work and how they are used to make informed decisions. Programming skills to work on AI technologies and create applications and solutions.

Communication skills to explain and present reports and results, creative thinking to generate new ideas and methods in the use of these technologies. Knowledge and understanding of

ethical issues related to the use of artificial intelligence technologies, such as privacy, bias and responsibility. Collaboration and teamwork skills to effectively develop and use artificial intelligence technologies.

9Challenges:

More than thirty years ago, information and communication technology became the key to addressing a variety of learning-learning problems, improving the quality of education. However, its integration only posed several challenges.

- A potential concern for education professionals is the "risk of extinction of the teacher's profession" resulting from predictions of future AI techniques and the real and psychological effects that can occur to those affected. Although AI is not advanced enough to replace teachers, it has since become able to play the roles of other employees in the education sector such as teachers' assistants and administrators.

- Some previous research warned that the widespread application of AI technologies in education could harm the relationship between teachers and learners and hinder their development to become future learners and able to dispense with online platforms and artificial teaching assistants.

- Another potential challenge is that AI technologies interfere with what students are expected to learn, by standardizing and stereotyping what they should learn, by "exaggerating" the individualization of education.

- As AI researchers, product developers, venture capitalists and educational technology advocates pay greater attention to the educational market, the potential negative consequences of poorly implemented or inadequate AI systems in education are increasing.

- Many schools and teachers still lack knowledge and are not ready to integrate artificial intelligence into education, increasing the risk of misuse of technology when applying artificial intelligence. This can have negative consequences for privacy and surveillance, and personal data can be leaked and used to influence individuals within the educational system. In this context, previous research has pointed to the importance of adopting ethical frameworks rather than using and developing artificial intelligence in education, while noting that they need to be constantly discussed and updated due to the rapid development of artificial intelligence technologies and its potential for wide application.

- The Humble & Mozelius,2022 study indicated that there are challenges related to important aspects of AI applications in the education sector that must be taken into account in their implementation.

These aspects relate to the following questions: What is the future role of teachers and staff of educational institutions in the widespread use of artificial intelligence systems in this sector? How does this comply with our educational convictions or theories? Do educational leaders and teachers have enough knowledge in the field of artificial intelligence to distinguish between a bad system and a good system?

Alternatively, how do we apply AI systems appropriately in the educational environment? How do we protect demand data and teachers when the skills and knowledge needed to develop AI systems in the education sector are linked to for-profit organizations rather than within the education sector (public in particular)?

These questions need careful study and careful treatment in the years to come, especially the question of the extent to which artificial intelligence is aligned with educational theory in future research, where the design of any new synthetic technology integrated into education should aim to meet educational needs.

In this context, the authors (Humble & Mozelius, 2022) recommend the programming of renewed training courses on artificial intelligence, which do not necessarily have to deal with the most technical parts of neural networks and natural language processing, but are instead designed for a general audience (such as students, teachers and administrative staff). Yes, there are some alternatives such as Mooc that have been developed over the past years, but there is still a lack of practical training courses on artificial intelligence and courses that discuss the ethical aspects of artificial intelligence.

-For its part, some of the site (yahoo.finanzas, 2023) states that the process of integrating information and communication technology into education strategies has been successful in some places while facing several complications elsewhere, Because the evolution experienced by AI is no longer just tools to help perform tasks But it also allows cooperation with the focus of the educational process in creating new things, which presents an additional challenge that must be addressed.

In this context, teachers and students must be taught to work collaboratively and critically with AI. Students especially need to understand how to use AI tools, systems and platforms. In particular, students should understand how to use AI tools, systems and platforms, and develop skills to use it safely, taking into account ethical controls. They do not use them for all kinds of homework without their teachers' knowledge. In this context, for example, reports by the Dutch website NOS.nl indicated that more than 250 students admitted to using a sophisticated synthetic text generator (ChatGPT) to perform their homework and, in almost all cases, were not disclosed (Yahoo, finanzas, 2023).

"_Molano" (MoIano, 2023) also indicates that if it is true that AI can perform tasks such as creating written content (paragraphs, articles....) Solving sports problems, solving tests and assessments..., it is important to bear in mind that these tasks are only part of what students are expected to learn in a high-quality education system, and that there are other processes such as: Thinking - not just getting ideas - analyzing and finding creative solutions to problems and being able to adapt to challenges in a variety of situations, which cannot be automated using artificial intelligence, to remain as a space for the teacher to help his or her demand for critical thinking, management and development of analytical, evaluation and creative skills.

That is, AI systems help students solve exercise, write articles, solve sports problems, get rid of spelling errors or get ideas... An important process reflects in promoting long-term understanding and retention of materials, but it cannot be a substitute for the learning process. Here is meant to "help" exercise and improve some skills and provide automated and personal feedback rather than "total replacement" of analysis thinking, essay writing, exercise solution, etc.

_We conclude by presenting what the UNESCO region (2019) (UrquiiIaCastaneda,2022) has proposed in this area, presenting six major challenges in the future regarding the integration of artificial intelligence into education as a means of improving equality and quality of education and promoting the achievement of sustainable development goals (SDGs), combining new opportunities for AI to improve education and how education should prepare/be students and future workers in an AI-driven world.

The following six challenges are presented:

*First challenge: a comprehensive AI policy for sustainable development.

*Challenge II: Ensuring inclusion and equity in AI in education.

*Challenge 3: Prepare teachers for AI-supported education and prepare AI to understand education.

*Challenge 4: Develop comprehensive and quality data systems.

*Challenge 5: Make research on artificial intelligence in education meaningful.

* Challenge 6: Adopt ethics and transparency in all the use and dissemination of data.

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