Interactive learning: Utilizing artificial intelligence

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ABSTRACT

One of the cutting-edge technologies is artificial intelligence (AI). Artificial intelligence (AI) has become widely accepted in a number of fields recently in the life of modern day human being, such as, knowledge acquisition, learning, healthcare, and security. In order to develop an interactive intelligent system for user interaction, the field of human-computer interaction (HCI) has been fusing AI and human-computer interaction during the past few years. By using different algorithms and utilizing HCI to give the user transparency and establish their trust in the computer, AI is being employed in a range of fields. Global scientists are interested in artificial intelligence, a significant technology that mimics human cognitive capacities. An artificial neural network, which can mimic human mind, is the fundamental building block of artificial intelligence technology. This form of brain architecture is composed of densely linked neurons and serves largely as a mechanism for processing input to deal with a specific problem. Due to a rapidly developing technology, robots may now perform tasks that were formerly reserved for humans alone. Along the perspective of knowledge development and interactive learning this paper tries to shade some light on recent researches and activities on AI influencing learning through a vertical literature review.

KEYWORDS: Artificial intelligence, learning, knowledge development, interactive learning, deep learning, healthcare, human-computer interaction, human-centered design, machine learning, usability, user-centered design.

INTRODUCTION

Digital technologies are now widely used for engagement in the contemporary world. One of the most important and fundamental components of all fields and industries nowadays is computing. Mobile computing has emerged as one of the key trends in our period among all the modern technologies (Grudin, 2019). In several cutting-edge fields, technological interaction has been given prominence. In the technical context, interaction variables are also critically important for user-friendliness and management (Zeng, Chen & Lew, 2020).

By integrating itself within the systems with the aid of various technological acceptance theories, artificial intelligence is playing a crucial role in increasing the flexibility and intelligence of interaction (Sohn & Kwon, 2019). The field of human-computer interaction is mostly utilized to facilitate user engagement with technology (Yun, Ma & Yang, 2021).

In other words, artificial intelligence is renowned for fostering intelligent interactions (Bryndin, 2020). With the advent of Explainable artificial intelligence, a new era has built a bridge between human-computer interaction and artificial intelligence (Nazar, et., at., 2021).

Healthcare, corporate operations, security, financial and legal decisions, autonomous vehicles, smartphones, and AI for designers are just a few of the fields where explainability in AI is active Arrieta, et., al., 2020). Figure-1 illustrates the key elements of AI system in terms of learning and knowledge acquisition.

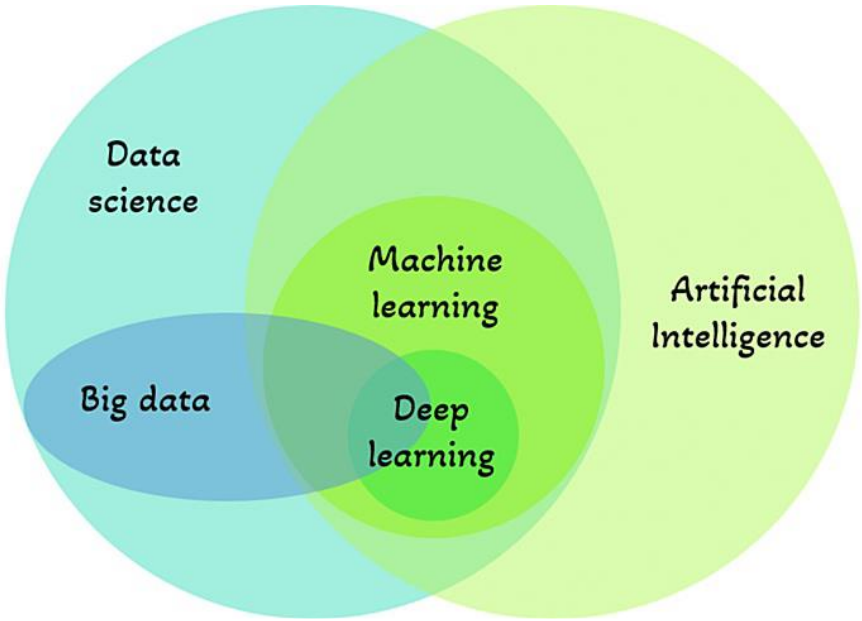

Figure-1: Key elements of AI systems (Adopted from Chen, 2022)

Interactive learning, a method of instruction made possible by technology, typically refers to online education. Interactive learning has recently gained prominence and been acknowledged by many institutions as a potential way to give students access to on-demand learning options to enhance their learning process. Virtual learning environments, distributed computing, flexible Internet environments, and general remote learning are all examples of areas where the concept of e-learning is understood (Darko, et al., 2011).

The Interactive learning experience can be impacted by a variety of elements, including structure, quality of support systems, material quality, quality of support networks, evaluation, and diversity of peer support networks (Arbaugh, 2000; Areti, 2006). To ensure that students learn effectively, universities and educators must take these aspects into account. Investigating the factors that influence student satisfaction with online learning is crucial (Bender, Wood & Vredevoogd, 2004; Roberts, et., al., 2005; Alnagar, 2020).

In our life, education is important. The primary aspect of education that is related to learning. Visualization and the ability to distinguish between right and wrong become more powerful with education. The computing power of intelligent machines and the development of new teaching and learning tasks are directly related to the future of education. These developments have the potential to fundamentally alter higher education institutions' internal structures and systems of governance.

The cost of education has increased significantly in recent years, making it difficult for low-income parents of talented kids to enroll their children in the reputable institutions of their choice. Education does assist one understand the true meaning of social and cultural norms in order to develop into a decent member of society.

Additionally, it highlights the constraints and dangers faced by contemporary students. The various aspects of artificial intelligence in higher education, especially interactive learning is examined in this paper. (Sethis, K., Chauhan, S. & Jaiswal, V., 2021). Therefore, as the methodology, this paper seeks to find various aspects of AI and its impact or utilization in the modern day life through a vertical literature review.

METHODOLOGY

The only way to improve the content and knowledge-based abilities in higher education is to upgrade it. As a result, knowledge representation and reasoning are crucial for representing facts, opinions, and information as well as for deducing the logical meaning of represented knowledge that is stored in knowledge bases. This paper offers a comprehensive overview of knowledge, representation, and reasoning in higher education, as well as the related art of study. For improved representation of facts, beliefs, and information, many artificial intelligence-based knowledge representation and reasoning methodologies and schemes are offered. Different methods of reasoning are explained in order to deduce the correct interpretation of the knowledge, and then various problems with knowledge representation and reasoning are addressed (Tomar, D. & Tomar, P., 2021).

The scholarly output on artificial intelligence in education (AIEd) has greatly expanded as a result of researchers and practitioners promoting AI and utilizing its pedagogical potential (Hinojo-Lucena et al., 2019). Scientific literature can be studied through the identification of research purpose, assessment of scientific collaboration, and detection of research themes to fully comprehend the background and current state of a topic (Chen et al., 2020). Given the explosive expansion of AIEd research, it would seem appropriate to synthesize the existing literature and provide a concise summary (Liang, 2021).

BACKGROUND

Understanding intelligent beings is the central principle or concept of artificial intelligence (AI). Numerous definitions discuss AI using various terminologies and frameworks. According to Kurzweil, artificial intelligence (AI) is the "art of building machines that perform tasks that require intelligence when performed by people" from 1990. Winston put up the alternative

definition of AI in 1992, describing it as "the Study of the Compilations that Make It Possible to Perceive Reason and Act." "The branch of computer science that is concerned with the automation of intelligent behavior," according to Luger's definition of AI in 1993 (Dosilovic, Brcic & Hlupic, 2018; Nazar, 2021).

Artificial intelligence is the study of intelligent agents, which are objects that can understand their surroundings and take appropriate behavior to maximize their chances of success. In other words, AI operates as an intelligent agent that chooses the optimal course of action given the circumstances (Ongsulee, 2017). Network load balancing, intelligent agricultural techniques, security, livestock, inventory management, and manufacturing and production are only a few of the industries where AI is in use (Shahid, et. al., 2020; Hassan, et. al., 2021). Figure-2 shows various trends of AI utilizing machine learning.

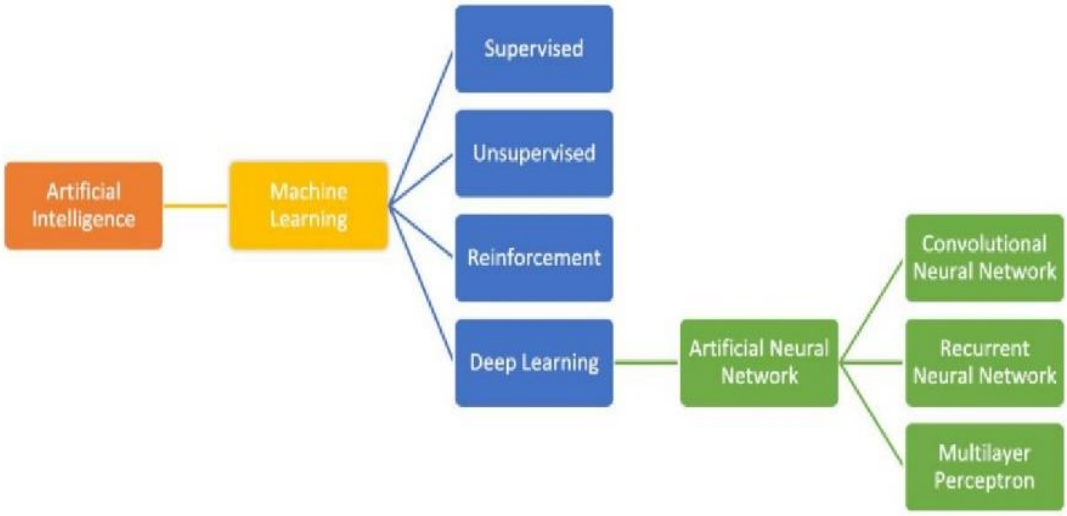

Figure-2: Artificial intelligence and its various applications through machine learning (Adopted from Nazar, 2021).

Deep learning, sometimes referred to as deep machine learning, deep structured learning, and hierarchical learning, is a field of machine learning. For sake of reasoning, it may be termed as interactive learning too, thus incorporating ideas to include AI methods and applications. Furthermore, it has been observed that deep learning extracts features on its own, without assistance from a human. This method draws inspiration from the artificial neural network, which is a component of the human brain (Kim, 2019).

An emerging technology that is well-liked in educational technology is artificial intelligence. In higher education, AI is essential to e-teaching and e-learning, which is more familiar to be termed as interactive learning. Exploring the wonders of AI's progress in higher education for teaching and learning processes is a primary focus of this paper. It examines how businesses teach and grow as well as the educational implications of emerging breakthroughs in transit student learning. Research is being done to forecast the future notion of cutting-edge instructing

in all reality. Late innovative degrees of development and the speeding new headway in cutting-edge training are studied. A thorough systematic review is used to present the function of AI in higher education (Diwaker, C., Sharma, A. & Tomar, P. (2012).

Artificial intelligence (AI) is advancing quickly and has been continuously changing the modern world for decades. All kinds of industries, including commerce, economics, transportation, healthcare, education, and so on, benefit from AI technologies. The growth of artificial intelligence in education (AIEd) has drawn the attention of numerous scholars, who focused on the ways in which AI supports teaching, learning, evaluation, referencing, and cooperation. There are several issues raised. How have AI technologies impacted education? How do AI technologies help with curriculum, assessment, student learning, and teaching methods in the classroom? How do educators handle artificial intelligence (AI) technologies? What ethical issues do AI technologies raise? What are the challenges facing education-based AI? (Shen, L., et.al., 2021).

Artificial intelligence (AI) has mostly been applied to education in a few ways that help with test systems and competency building. It is envisaged that AI will help solve the demand for learning, education, and teaching with the continuous development of educational AI solutions. To offer teachers the time and freedom to learn and adapt—uniquely human skills that would struggle on machines—AI can improve performance, personalize, and expedite administrative procedures. The ideal AI educational system would produce the best outcomes for pupils by combining the strengths of both teachers and machines. Education professionals have long been concerned about tailoring the curriculum to meet the unique needs of each student, but the AI gives teachers a previously unheard-of level of flexibility to manage 30 pupils in each session. With AI, there are numerous possibilities for the teaching and learning process that take into account each student's interests and comprehension, which will improve the effectiveness of the educational system (Sakalle, et. al., 2021).

For many years, computers have been playing a major role in the field of education. Artificial intelligence (AI) research has recently had a positive impact on applications in education. Using sophisticated machine learning and deep learning algorithms, knowledge could be derived from incomplete data.

The author has examined the effects of artificial intelligence on the field of education in this paper. The author will go through how various interactive learning models can predict student performance as a result of the advancement of learning techniques over the past few decades. It has been observed that contemporary models can spot the problems by getting to know each pupil. The author will next try to suggest various learning strategies for raising student performance after that (Kharb, L. & Singh, P. (2021).

Higher education's future is inextricably related to advancements in new technologies and the computing power of emerging intelligent machines. Advances in artificial intelligence in this area present new opportunities and problems for teaching and learning in higher education and have the potential to significantly alter governance and the internal structure of these institutions. Technology should not be used in higher education to replace or replace the educational process with a set of processes for material distribution, control, and assessment. Instead, it should be

used to improve human thinking and to support it. With the development of AI solutions, it is crucial for educational institutions to be vigilant and ensure that tech lords do not monopolize control over the secret algorithms that fuel them. This paper has tried to discuss both the advantages and disadvantages of AI technologies for higher education teaching, learning, and research utilizing AI (Tomar, P. & Verma, S. (2021).

To enhance further discussions, a few important aspects of AI has been discussed in the next section that throws light on the evolution of learning among many perspective of the modern society.

DIFFERENT ASPECTS OF AI:

First, the general scope of learning is being discussed; then the relationship with quantum theory has been put forward; afterwards, as a case study, utilization of AI in radiology has been discussed; thereafter, use of AI in machine learning and healthcare sectors has been synthesized.

Learning:

The number of published studies in the area has expanded as a result of the growing use of Artificial Intelligence (AI) technology in education. Since it has the ability to support learning in a variety of contexts, artificial intelligence (AI), a machine-based technique with algorithmic power for making predictions, diagnoses, recommendations, and decisions, has gained importance within the educational community (Hwang et al., 2020a). With several applications including intelligent tutors for content delivery, feedback providing, and progress supervision (Bayne, 2015), the field of artificial intelligence in education (AIEd) has exhibited technological advancements, theoretical developments, and successful pedagogical influence (Roll & Wylie, 2016).

The advantages of AIEd are well known. Instructors can teach effectively and efficiently through tailored and adaptive education by using AI to give specialized support and increase knowledge-gap awareness (Guan et al., 2020). Additionally, AI offers algorithm-based judgments that allow for efficient real-time evaluation of complicated abilities and knowledge (Chen et al., 2021). Additionally, classroom dynamics and student involvement can be examined using AI-enabled educational systems, which helps to identify at-risk pupils in real-time mode and enables prompt intervention (Tsai et al., 2020).

In recent years, classrooms and teaching methods have benefited from the introduction of computer hardware, software, and internet services. However, it is necessary for artificial intelligence (AI) to cause the actual disruption in education. Artificial intelligence has established itself as a force that can fundamentally alter several industries, bringing about previously unimaginable changes. Expert systems can be created to interact with the environment using AI in ways that mimic human abilities including speech recognition, visual perception, and intellectual activity. In order to improve learning and life outcomes for everyone, this paper will discuss the role of artificial intelligence in the education sector, including its market size, the impact of AI in education, and case studies of current AI presence in education

(smart content, smart tutoring systems, virtual facilitators, and learning environments, etc.). The paper ends with a discussion of the concerns and problems (Sharma, et., al. (2021).

ITSs for special education, NLP for language education, educational robots for AI education, EDM for performance prediction, discourse analysis in CSCL, neural networks for teaching evaluation, affective computing for learner emotion detection, recommender systems for personalized learning, and ITSs for special education are eight promising areas within AIEd (Liang, et. al., 2021).

Quantum theory and learning:

Intelligent learning systems and quantum information technologies are both emerging technologies that are anticipated to have a profound impact on civilization in the future. The associated fundamental research fields

Machine learning and artificial intelligence (AI) versus quantum information (QI) both have their own unique problems and issues that have thus far primarily been studied independently. However, a growing amount of recent study has explored the issue of how much various fields can actually benefit from one another.

QML investigates the relationship between quantum computing and machine learning, examining how the findings and methods from one field might be applied to address issues in the other. We have recently seen notable advancements in both directions of influence. For instance, quantum computing is finding a crucial use in accelerating machine learning tasks, which are essential in our "big data" age. On the other hand, machine learning is already ingrained in a number of cutting-edge technologies and may play a significant role in advanced quantum technologies. Quantum improvements have been (theoretically) proven for interactive learning tasks, demonstrating the potential of quantum-enhanced learning agents, in addition to quantum speed-up in data analysis and classical machine learning optimization employed in quantum experiments. The first accomplishments in using artificial intelligence to design quantum experiments and conduct autonomously some aspects of real research have also been reported.

The majority of the physical disciplines have been influenced by quantum theory. The impact of this ranges from minimal adjustments to significant overhauls, especially in fields that deal with somewhat small sizes. It was discovered in the latter half of the 20th century that real quantum effects can also be used to enable characteristics that are superior to those possible with purely classical systems in engineering-type activities. The laser, transistors, and nuclear magnetic resonance devices were all developed during the first wave of such engineering.

The second wave, which picked up steam in the 1980s, is an extensive, if not entirely systematic, examination of the possibility for using quantum effects for diverse jobs that, at their core, include the processing of information. This covers the scientific fields of computing, sensing, metrology, and cryptography, all of which now speak the same language of quantum information science. Research into these interdisciplinary programs was frequently incredibly fruitful. For instance, quantum computation, communication, cryptography, and metrology are currently

mature, influential academic fields that have, arguably, altered the way we think about information and its processing.

It has been clear in recent years that the interaction between the fields of artificial intelligence and machine learning, quantum information processing, and has its own serious questions and prospects. Although many study areas are only now beginning to receive more attention, the very first concepts were already present in the early years of QC, and we have made an effort to fairly recognize such forward-thinking studies (Dunjko & Briegel, 2018).

Precision education in radiology:

The focus of health care is changing from populations to individuals in the era of customized medicine. Artificial intelligence (AI), which has potential uses in radiology in particular, is able to learn without explicit instruction.

While teaching radiology students about AI has received a lot of attention, our goal is to concentrate on how radiology students may be taught more effectively using AI. Although the concept of utilizing AI to enhance education is not new, relatively little AI is currently being used in medical and radiological education. We present an AI-integrated framework to supplement radiography education based on the current educational framework and provide use case examples informed by the operations of our own institution. The emergence of "AI-augmented radiology" may pave the way for not only "precision medicine," but also for what we term "precision medical education," which involves individualized instruction for each student based on their requirements and learning preferences (Alam, 2020).

Numerous ways in which the use of artificial intelligence (AI) in medicine will alter radiology practice. There is growing agreement that teaching medical students and post-graduate training in radiography should now include understanding AI (Slanetz, et. al., 2018; Pietrzak, et. al., 2018). The discipline has talked about training radiologists in AI use, but the focus of this research is on using AI for "precision education" in radiology.

In general, AI has the potential to increase production and efficiency in the medical field. Artificial intelligence (AI) techniques are computational models that may simulate human performance on a job, frequently without being specifically built for that activity. Although AI more generally refers to a much broader collection of computational algorithms that carry out complicated activities previously assumed to require human ability, deep learning models are one class of AI that have achieved recent success. A few examples of current effective AI radiological applications are (i) anomaly identification, (ii) anatomic segmentation, (iii) picture quality assessment, (iv) natural language processing (NLP), and (v) protocol and worklist optimization (Lakhani, et. al., 2018).

Figure-3 shows how to approach learning theories in a triangle and how to include AI into radiology education. Each of the learning theories—behavioral, cognitive, and constructivist—presents problems and potential answers.

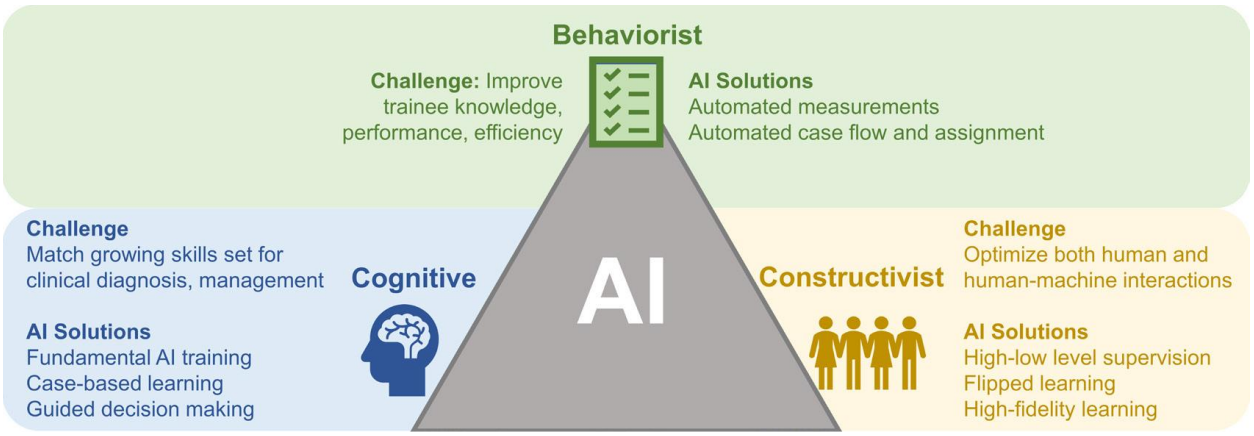

Figure-3: Approach of AI based learning theories in the field of radiology education (Adopted from Alam, 2020).

Machine Learning and Artificial Intelligence:

Machine learning is the creation of automated systems that are capable of processing massive volumes of data to extract relevant and possibly useful information (data mining) and to use that information to solve real-world issues. Data classification refers to the combination of the two elements, i.e., information extraction and application. In this context, the goal is to create tools that, after studying a sizable labeled base of available data, are able to automatically label data that hasn't been seen before (Maglogiannis, 2007).

Within the last ten years, "machine learning" and "artificial intelligence" applications have grown in popularity. In science and the media, both phrases are widely used, occasionally with the same meaning and other times with different connotations. In this work, we want to define the relationship between these concepts and, more specifically, to define how machine learning contributes to artificial intelligence.

The words data mining, deep learning, and statistical learning are connected, frequently used in the same context, and occasionally used interchangeably with machine learning and artificial intelligence. Despite being extensively used in various cultures, the phrases' specific meanings and usage vary greatly.

Machine learning is an area of computer science that focuses on creating effective algorithms to solve issues with computational resources. While machine learning makes use of statistical concepts, it also incorporates techniques that are not wholly dependent on statisticians' earlier work, leading to original and highly referenced contributions to the subject. In recent years, interest in deep learning in particular has surged. Deep learning models may learn representations of data with numerous degrees of abstraction since they are made up of multiple processing layers. Deep learning has significantly enhanced machine learning's capabilities, such as in speech and picture recognition (Duong, 2019).

With the aid of computer systems that can learn to solve a problem instead of being explicitly programmed, a set of techniques known as "machine learning" are frequently employed to tackle a variety of real-world problems. We can distinguish between supervised and unsupervised machine learning in general. As supervised approaches are the ones that are most frequently employed, we concentrate on the latter for the sake of this work. Learning in the context of supervised machine learning refers to the process of gaining information about a given task through the use of a set of examples (or "past experience").

Although statistical methods are employed during the learning process, it is not necessary to manually modify or program rules or strategies in order to solve a problem. In order to create a model by running an algorithm on a set of known data points in order to gain knowledge about an unknown set of data, (supervised) machine learning techniques always try to do this.

In contrast, artificial intelligence imitates intelligence in machines by using methods like machine learning, statistical learning, or other methods like descriptive statistics (Duong, 2019).

Healthcare:

The amount of interest in using artificial intelligence techniques in medicine and healthcare has significantly increased over the past few decades. Healthcare organizations are requesting more and more computer interaction from doctors and nurses as the discipline of e-health, or electronic health systems, develops to support more clinical operations. Many scholars who work in the AI domain are drawn to the field of computational analysis and artificial intelligence in medicine in this context. The majority of research projects in this field focus on creating diagnostic tools that will aid medical practitioners in their work (Maglogiannis, 2007).

While intelligent tele-medicine and tele-health apps address the requirement for ongoing medical supervision of residents in remote, underserved places, expert systems and machine learning algorithms are utilized to provide second views in diagnosis. By using data mining, computational analysis, visualization, and simulation of data and experiments, medical and biomedical informatics increase the search for new information about biological and therapeutical processes.

By enhancing healthcare and switching to digital health technology, which encompasses several fields like artificial intelligence, big data, wearables, and medical technology and gadgets, significant breakthroughs in the field of healthcare have been made in recent years.

Every day, there is a greater need for healthcare technologies. To increase technology adoption, ensure compliance, good ergonomics, and high-performance design for all users and contexts of usage, there are numerous problems and gaps between industry and academia that need to be filled. Several applications have been mentioned for enhancing HCI in prior research on healthcare. A few of them are a natural user interface, kid computer interaction, interpretation for those with disabilities, and human factors in healthcare.

The most important field when discussing AI and HCI is human-robot interaction. Robots have been employed in industry in the past. Today, however, robots are also employed in social

settings. The main goal of social robots is to integrate into human society and interact with people. Robotics in the healthcare industry is being used to address issues such a lack of healthcare personnel, rising healthcare expenses, and an increase in vulnerable populations like the ill, elderly, and children with impairments.

AI is supplying insights to the healthcare industry that can enhance patient and clinical team results, lower costs, and influence public health. Early detection and diagnosis are the other tasks that AI is carrying out in the healthcare industry]. According to reports, AI is used to process both organized and unstructured healthcare data.

Various fields of healthcare and medicine are implementing and using artificial intelligence. The use of AI in healthcare encompasses such tasks as identification, diagnosis, and treatment as well as patient interaction and health management (Nazar, 2021).

FUTURE ISSUES

Beyond the obvious examples, direct computational approaches to build human-level Go-playing software had failed, whereas AlphaGo (Silver et al., 2016), a fundamentally learning AI technology, achieved this complex goal. It has recently become increasingly clear that learning methods may make the difference between a given technology being realizable or being effectively impossible. In fact, quantum computing (QC) may develop into a technology that lowers the barriers to quantum computers through exquisitely quick and adaptive control, potentially implemented by an autonomous smart lab. However, cutting-edge research suggests that machine learning (ML) and artificial intelligence (AI) techniques may be able to assist at a deeper level by assisting in the discovery of novel physics that may be the missing piece for fully developed quantum technologies. We may, therefore, require ML and AI to create quantum computers (Dunjko & Briegel, 2018).

Although there may be basic reasons for framing such a broad theory, it may also have more practical repercussions. In fact, it may be argued that the fields of quantum machine learning and future quantum artificial intelligence may make up one of the most significant research fields to have emerged in recent years. Such a bold statement is justified in part by the clear possibility of influence in both directions between the two components of quantum learning (and quantum AI). In fact, the interactive learning in a sense is highly involved within the intricate evolution of the AI techniques. Hence, future learning methods need to be observed among various perspectives of AI formations.

OPPORTUNITIES AND CHALLENGES

There has been a heated philosophical debate surrounding the phrase "Artificial Intelligence" since John McCarthy first used it in his proposal for the Dartmouth Conference in 1955, but it had had been used earlier as evidenced by works by Alan Turing, for example. Questions like "what is it?" and "can it really exist?" as well as "will it ever surpass human intelligence?" and "how should we refer to it?" have plagued us for years and their intensity hasn't lessened.

Whatever our individual responses to the aforementioned philosophical issues may be, there is one fact that we can all accept as given. Artificial, computational, or machine intelligence, or simply AI, is a field that has recently started to reach maturity. Therefore, whether or not they are legitimately referred to as intelligent, a long range of approaches, tools, and applications that have been developed under the broad heading of artificial intelligence have offered useful solutions to challenging real-world issues. Furthermore, it is obvious that, as computing develops, research in the field of artificial intelligence will provide solutions to an increasing number of real-world issues (Maglogiannis, 2007).

The incapacity of humans to oversee and validate the machine's operation is one issue that is frequently related with machine learning. The fact that automated systems examine a big volume of data in a digital format is one of the factors that renders the task hard for humans to complete. Two study areas that concentrate on resolving this issue are dimension reduction and data visualization.

We live in a world where artificial intelligence (AI) exists. AI has a different degrees of influence on anything we do online. It can automate a variety of processes in schooling and other fields. The education sector is mostly benefited by AI, particularly for educational purposes. There may be software to carry out all tasks that require automation. This software can highlight areas for course enhancement. Students and teachers can benefit from the feedback provided by AI software. Data that is powered by AI benefits students, teachers, and educational institutions. AI in education has many advantages that enhance student learning, including personalization, instruction, grading, feedback on course quality, building a worldwide classroom, performance monitoring, and many more. When a new, promising technology is developed, it may appear to create whole new options for resolving long-standing issues since the limitations of the technology and the difficulties in utilizing it are frequently not fully appreciated (Singh, T. & Mishra, J., 2021).

Other difficulties will need to be overcome for precision education to be implemented successfully. All stakeholders, including trainees, program directors, etc., must consent to the use of AI. The learning curve for doctors, technologists, and engineers will be quite steep.

Almost everyone's daily existence requires them to make hundreds of decisions. "Good decision making" refers to the ability to make decisions based on information that is accurate, timely, and suitable. A very effective tool for making logical decisions based on many kinds of information is emerging: decision support systems. The author made an effort to comprehend how wise choices are necessary for any successful endeavor in this paper. Finding and analyzing the appropriate information is a laborious task that always calls for professional guidance in our complicated environment where the explosion of information has both positive and negative consequences. In today's digitally-driven world, a variety of apps are made specifically for the educational field to benefit both students and teachers. For the finicky or confused student, technology can speed up decision-making and help (Arora, M., 2012).

CONCLUSIONS

Since it has the ability to support learning in a variety of contexts, artificial intelligence (AI), a machine-based technique with algorithmic power for making predictions, diagnoses, recommendations, and decisions, has gained importance within the educational community (Hwang et al., 2020a). With several applications including intelligent tutors for content delivery, feedback providing, and progress supervision (Bayne, 2015), the field of artificial intelligence in education (AIEd) has exhibited technological advancements, theoretical developments, and successful pedagogical influence (Roll & Wylie, 2016). The advantages of AIEd are well known. Instructors can teach effectively and efficiently through tailored and adaptive education by using AI to give specialized support and increase knowledge-gap awareness (Guan et al., 2020).

More research on the best ways AI may support personalized learning, such as adaptively proposing learning materials and supporting learners' problem-solving, is necessary given the widespread adoption of personalized learning (Chen et al., 2021). However, in order to deliver personalized experiences, large-scale learner data—which can be extremely personal—are necessary for training AI models.

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Biography

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