

Artificial Intelligence: A Role in Higher Education

- Kadam J. L.*

Department of Economics, H.P.T Arts & R.Y.K Science College, Nashik

Artificial intelligence (AI) in education has rapidly emerged as a focal point within educational research. AI offer numerous advantages as a supplementary tool for pedagogical techniques. To explore the breadth of Artificial intelligence (AI) is used in higher education (AIED) to improve teaching, research, and operations. AI technologies include machine learning, generative AI, and computer vision. This paper presents the various aspects in using AI tool in higher education. AI is a set of technologies that enable computers to perform a variety of advanced functions, including the ability to see, understand and translate spoken and written language, analyze data, make recommendations, and more. AI is the backbone of innovation in modern computing, unlocking value for individuals and businesses. For example, optical character recognition (OCR) uses AI to extract text and data from images and documents, turns unstructured content into business-ready structured data, and unlocks valuable insights. AI is a broad term for technologies that allow computers to perform tasks that usually require human intelligence. AI uses algorithms, data, and computational power to simulate human intelligence.

Key Words : Meaning of AI, educational goal, benefits and disadvantages of AI.

Introduction:

The use of Technology has increased tremendously in every field and the education sector remains no stranger to this development every Technology innovation is done with the main aim of assisting manual labour to improve productivity and outcomes. Alan Turing in 1950s describe a system "Artificial" or "Intelligent" if it passed an imitation game in which a human listener has to distinguish between a conversation with human and machine. If the listeners fail to identify a difference the system is to be described as an "Intelligent" or "Artificial" system. The term artificial intelligence was first used in 1955 by John McCarthy, a Dartmouth math professor. AI is a booming technology domain capable of altering every aspect of our social interaction. It has been seen that the use of Artificial Intelligence in education has initiated new teaching and learning solution that are currently being modified and restructured in different context through welcomed by academicians, students, industries and other stakeholders. The increase applications of AIED demand interdisciplinary approaches while most AI research is carried out only in STEM fields. Research in AIED has surged in recent years, yielding a substantial body of work exploring various aspects of these applications, including design, effectiveness and outcomes. Recent statistics indicate that 43% of college students in the US use AI tools like chat GPT and half of instructor's employee AI to develop their lessons. Adaptive

learning enabled by AIEd has been shown to improve student test result by 62%, while AI usage, in general enhances student performance by 30% and reduce anxiety by 20%. 60% of current occupations have the possibility of being automated in the next 10 years¹.

Objectives:

1. To study the importance of AI
2. To study the disadvantages of AI
3. To study the role of AI

Research Methodology:

This research utilizes a mixed-method approach, combining qualitative and quantitative data. The methodology includes:

Qualitative Data: Interviews

Quantitative Data: Survey

Result and Discussion:

Mathematics plays a pivotal role in AI Courses in linear algebra, calculus, probability and statistics from the bedrock upon which AI algorithms are built. Linear algebra, for instance, is indispensable for understanding neural networks and deep learning, while probability and statistics are crucial for machine learning models and data analysis. An introduction to Artificial Intelligence course will provide students with an overview of AI, covering its history, application and fundamental techniques. This should be followed by a specialized course in machine learning, including supervised and unsupervised learning, reinforcement learning, and deep learning. Machine learning is the heart of AI. Enabling system to learn from data and improve over time without explicit programming.

Course in Robotics and Expert Systems should also be included. Robotics combines AI with mechanical engineering, allowing students to create intelligent machines capable of performing complex tasks. Natural Language Processing and computer vision are also crucial components of the core AI curriculum; NLP enables machines to understand and generate human language translators. Computer vision, on the other hand involves teaching machines to interpret and understand visual information from the world, which is essential for applications such as autonomous vehicles and facial recognition system. The inclusion of AI for the internet of things (IoT) and AI in cybersecurity reflects the interdisciplinary nature of modern AI applications. IoT involves connecting everyday devices to the internet, creating vast networks of data that AI can analyze and optimize. Cybersecurity, on the other hand, leverage AI to detect and respond to threats, enhancing the security of digital system.

Benefits of Artificial Intelligence:

1. Automation:

AI can automate workflows and processes or work independently and autonomously

from a human team. For example, AI can help automate aspects of cybersecurity by continuously monitoring and analyzing network traffic. Similarly, a smart factory may have dozens of different kinds of AI in use, such as robots using computer vision to navigate the factory floor or to inspect products for defects, create digital twins, or use real-time analytics to measure efficiency and output.²

2. Reduce human error:

AI can eliminate manual errors in data processing, analytics, assembly in manufacturing, and other tasks through automation and algorithms that follow the same processes every single time. Humans make decisions based on individual judgements and biases. Using specific algorithms, machines make decisions based on empirical data and algorithms. This minimises the chances of error and eliminates human error. For difficult problems that require complex calculations with no margin of error, machine learning and artificial intelligence provide the perfect solution. Today, this is done in several forms. For example, businesses today use virtual or digital assistants and bots to engage users. This helps in minimising human effort and error and also saves time. These digital assistants are designed to always provide the best solution to the user based on predetermined data and responses fed by the machine learning expert. AI functions with a zero margin of error. Every AI-powered system, solution, bot or program is fed data that help it analyse given situations, respond to them and learn new variations of responses based on frequent situations. Applications where this is necessary include space travel, Medicare and hospitality, among other domains, where precision is key.

3. Eliminate repetitive tasks:

AI can be used to perform repetitive tasks, freeing human capital to work on higher impact problems. AI can be used to automate processes, like verifying documents, transcribing phone calls, or answering simple customer questions like “what time do you close?” Robots are often used to perform “dull, dirty, or dangerous” tasks in the place of a human any business; there are several tasks that are repetitive and mundane. While they don’t require too much thinking, they are important and need dedicated personnel. This adds to company costs and also has some margin of error due to human intervention.³ Using AI-powered solutions, businesses can automate these tasks to save time and money. They also create a seamless customer experience. Some of the most important tasks automated using AI include customer support and user engagement. AI can also take on additional responsibilities when businesses adjust various parameters available to suit the task at hand. Human beings cannot be ‘adjusted’ this way, which makes them very limited in terms of their potential as compared to artificial intelligence.

4. Fast and accurate:

AI can process more information more quickly than a human, finding patterns and discovering relationships in data that a human may miss. When human beings perform tasks, there is always an inherent risk of loss of life. This is true for a wide range of situations like bomb diffusers, space exploration, sewage treatment etc. By using an

AI-powered robot for this task, business organisations can overcome these risks and reduce them to 0%. Additionally, machines can provide a higher degree of accuracy than human beings.

5. Infinite availability:

AI is not limited by time of day, the need for breaks, or other human encumbrances. When running in the cloud, AI and machine learning can be “always on,” continuously working on its assigned tasks.

6. Accelerated research and development:

The ability to analyse vast amounts of data quickly can lead to accelerated breakthroughs in research and development. For instance, AI has been used in predictive modelling of potential new pharmaceutical treatments, or to quantify the human genome.

7. No tiredness or wear and tear:

Human beings are physically limited. They cannot withstand all physical environments and high-pressure situations for endless periods. This is where AI comes in handy, to go where humans cannot go themselves. This includes high-pressure environments such as deep-sea exploration. Due to the customisable mechanical structure of the hardware, there are fewer chances of irreplaceable wear and tear or damage.

8. New and innovative solutions:

AI has been the driver of growth and innovation in a wide range of industries and businesses. With the world focusing more on ‘smart’ solutions and devices, AI is the technology that is making each of these devices smarter. With AI applications like smart watches, smart appliances and smart cars, the world is quickening reaching a place where human intervention has been minimised and solutions that were inherently manual have been automated entirely.

9. Available around the clock:

Humans need breaks, but machines don't. According to several studies, humans are known to achieve peak productivity for only about 3 to 4 hours a day. They also require vacations and time off work to recover from stress whenever they are overworked. Another advantage of AI is that it doesn't require time off and can be available 24x7.⁴

Disadvantages of Artificial Intelligence:

1. Leads to unemployment:

AI-powered solutions are an efficient way to automate a wide range of tasks, repetitive and otherwise, thus minimising the need for human personnel. As a result, a growing section of the workforce is facing unemployment as organisations around the world replace human beings with robots and AI-powered solutions. The competition across industries is increasing multi-fold and businesses are focusing on providing the best customer experience possible. AI solutions provide a consistent experience for all users,

making them the best solution available to boost business growth.

2. No ethics or emotions :

Ethics and morals are highly subjective and cannot usually be defined by rules or algorithms. One of the greatest fears humans have regarding AI is the impulse to wipe out humanity to save the planet from further damage and destruction. The only thing stopping humans from doing this are their legal and moral obligations. Moreover, emotions and ideologies form the basis of team building and collaboration. This limits AI in comparison to human knowledge and expertise.

3. Lack of improvement :

AI has been designed to perform a single task optimally no matter how many times it has to. However, in terms of improvement and growth, AI remains limited in its scope. If you want any changes or improvements in the outcome while using an AI solution, you must update your tool and algorithm to reflect this change.

4. High cost of creation and design:

AI solutions have been designed to mimic human behaviour. Creating a solution that can not only replicate the human mind but also evolve and personalise answers is not a small task. Businesses need to allocate a large volume of resources, personnel, time and money to create a state-of-the-art AI solution. Even the most fundamental ones require significant attention to detail and expertise, which doesn't come cheap. Additionally, as technology evolves and user behaviour patterns change, manufacturers must move forward too. The cost of constantly updating technology and usage patterns also weighs on the hiring organisation.

5. Humans become lazy:

As machines and devices become smarter, humans become lazier. We have gone from a time when people had memorised entire lists of phone numbers to people not having to remember any information since it is readily available to them. This is not an immediate problem, but it will lower the quality of individuals in the generations to come.

Conclusion:

Artificial Intelligence, ranging from narrow AI to superintelligent AI, has profoundly impacted various sectors, from healthcare to transportation. Its ability to analyze vast amounts of data and make predictions has led to increased efficiency and new opportunities. However, it also presents ethical challenges that we must navigate carefully. As we move forward, it is crucial to continue researching and developing AI in a responsible manner, ensuring that it serves as a tool for human betterment while mitigating potential risks.

References:

1. Floridi, Luciano, *"The Ethics of Artificial Intelligence: Principles, Challenges, and*

- Opportunities*" (Online Edn, Oxford Academic, 24 Aug. 2023),
2. Rajiv Malhotra, "Artificial intelligence and the future power" Blog (2021).
 3. Tom Taulli Artificial Intelligence Basics: A Non-Technical Introduction 1st Edn, [Apress (2019).
 4. <https://www.koenig-solutions.com>
 5. University News a weekly Journal of Higher Education Vol. 62 no.45 November 04-10, (2024).
 6. University News a weekly Journal of Higher Education Vol. 62 No.26 June 24-30, (2024).
 7. University News a weekly Journal of Higher Education Vol. 62 No.42 October 14.20, (2024).