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Artificial Intelligence in Education

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Abstract

Computer and information communication technologies have over the years continued to evolve, leading to the development of artificial intelligence. Artificial intelligence, according to Coppin, is the ability of machines to adapt to new situations, deal with emerging situations, solve problems, answer questions, device plans, and perform various other functions that require some level of intelligence typically evident in human beings (p.4). In another definition, Whitby defined artificial intelligence as the study of intelligence behavior in human beings, animals, and machines and endeavoring to engineer such behavior into an artifact, such as computers and computer-related technologies (p.1).

Keywords- Computer, information communication technologies, Artificial Intelligence, Education.

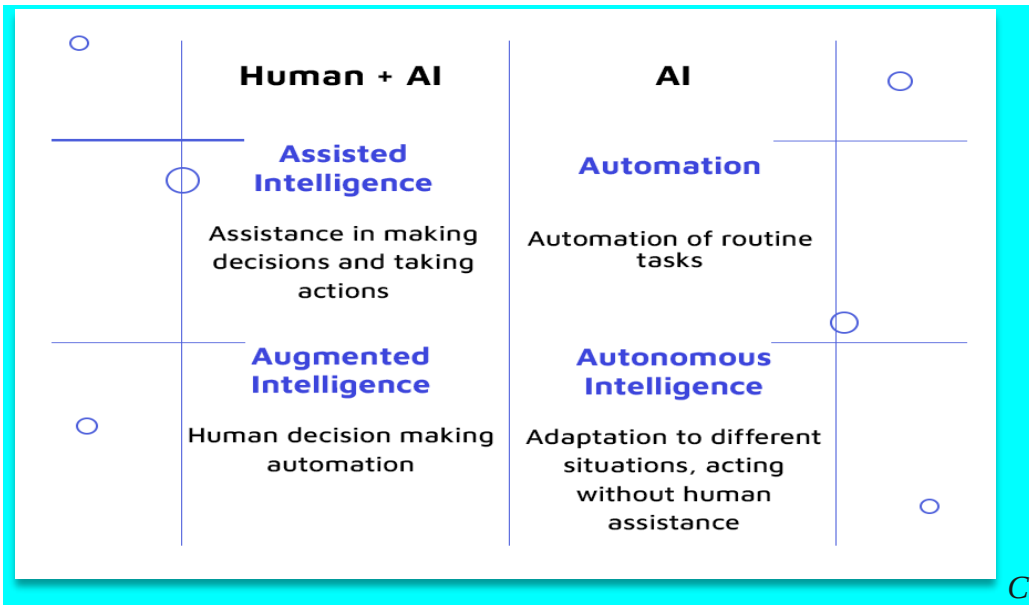
Introduction

In line with the adoption and use of new technologies in education, artificial intelligence has also been extensively leveraged in the education sector. Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices, and ultimately accelerate the progress towards SDG 4. However, these rapid technological developments inevitably bring multiple risks and challenges, which have so far outpaced policy debates and regulatory frameworks.

PRINCIPLES OF ARTIFICIAL INTELLIGENCE
AI tools mostly comply with 3 basic principles:

1. **Learning:** Acquiring and processing the new experience, creating new behavior models
2. **Self-correction:** Refining the algorithms to ensure the most accurate results
3. **Reasoning:** Picking up the specific algorithms to resolve a specific task

AI is Presented in 4 basic forms:



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The forms of AI in the first row are incapable of learning from their experience.

Regarding the big opportunities, AI tools open for every sector including the educational one. The adoption of technology seems to be one of the most promising ways to transform organizations.

ROLES OF AI IN EDUCATION

Artificial Intelligence (AI) has always been a big topic of discussion. The knowledge of AI, as we know, predominantly comes from sci-fi films and books. The movies and novels have often portrayed AI as the cause of genocide and destruction, but there is more to it than that! With a few brilliant scientists, like the late Stephen Hawking, arguing against the creation of AI, many others justify its invention to benefit humanity tremendously. The machine intelligence phenomenon has already begun its integration with every sector, including the education system. Educationalists anticipate the role of Artificial Intelligence, in the education sector, to increase dramatically in the next few years. Global adoption of technology in education is transforming the way we teach and learn. Artificial Intelligence is one of the disruptive techniques to customize the experience of different learning groups, teachers, and tutors.
Not only does AI have the capacity to transform the existing automated management systems, which automate administrative operations at the institution level, but it also has the ability to transform the conventional teaching and learning methods technologically. It does this by seamlessly integrating with eLearning tech and online Learning Management Systems (LMS), to introduce educational technology, such as Virtual and Augmented Reality in classrooms, which provide real-time teaching and learning experiences to students as well as teachers.

This is how Artificial Intelligence tools may be applied to improve study processes:

1. Personalize Education

Artificial Intelligence helps find out what a student does and does not know, building a personalized study schedule for each learner considering the knowledge gaps. In such a way, AI tailors studies according to student's specific needs, increasing their efficiency.
To do it, many companies train their AIs, armed by the Knowledge Space Theory, to define and represent the knowledge gaps, taking into account the complexity of scientific concepts relations between each other (one can stimulate the learning of another or become a basis for filling in the gap).

2. Produce Smart Content

- **Digital lessons**
  Digital learning interfaces with customization options, digital textbooks, study guides, bite-sized lessons, and much more can be generated with the help of AI.
- **Information visualization**
  New ways of perceiving information, such as visualization, simulation, web-based study environments, can be powered by AI.
- **Learning content updates**
  Besides, AI helps generate and update the content of the lessons, keeping the information up to date and customizing it for different learning curves.

3. Contribute To Task Automation

Administrative tasks simplification: grading, assessing, and replying to students is a time-consuming activity that could be optimized by the teacher using AI.

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Do you remember the hints Gmail provides in the messages you compose based on the overview of your current and past messages plus the business vocabulary essentials? It would be great to have such an option on any Learning Management System or learning platform envisaging the feedback.

(AI-powered grading tool could be trained to display the information on the learning progress of each student)
Entrusting a set of routine tasks to AI helps teachers make room for something more important: concentrating on grading the assignments impossible to delegate to Artificial Intelligence, self-education, upgrading the quality of the lessons.

4. Do Tutoring

Continuously evolving personal study programs take into account student's gaps to fill during individual lessons. Personal tutoring and support for the students outside of the classroom help learners keep up with the course and keep their parents from struggling to explain algebra to their kids. AI tutors are great time-savers for the teachers, as they do not need to spend extra time explaining challenging topics to students. With AI-powered chatbots or AI virtual personal assistants, students can avoid being embarrassed by asking for additional help in front of their friends.

5. Ensure Access To Education For Students With Special Needs

The adoption of innovative AI technologies opens up new ways of interacting for students with learning disabilities. AI grants access to education for students with special needs: deaf and hard of hearing, visually impaired, people with ASD…
Artificial Intelligence tools can be successfully trained to help any group of students with special needs.

Role Of AI In Administrative Management-

Currently, the reliance of educational institutions on automated ERP management systems to conduct or oversee administrative operations, such as student registrations, course allocations, dorm/hostel management, staff recruitment, fee collection, and many more, is expected to decrease with AI-driven systems. This is mainly because the AI-governed applications require very less, to be precise, no human interference, at all, to perform desired tasks, whereas the automated systems, despite possessing automatic characteristics, still, require human assistance to perform operations.

For instance, imagine registering a student to a course based on his/her rank, score, educational background, and other aspects using an automated student information management system (SIS). Such a system requires an operator to enter all the necessary details into the system so, that it can conduct analysis and display the best result of available courses. Then, the operator is facilitated to assign the desired course, chosen by the student, from the prescribed options. While this process reduces the management's burden of processing and analyzing applications, it still requires manual actions to perform operations. Now imagine, conducting the same procedure using an AI-driven system. Here, all the operations, right from automatically receiving the data from the online form to assigning candidates to the right course from their priority list, are performed without any human interference.

Nowadays, data security is one of the biggest concerns for educational organizations. Educational institutions, such as schools, colleges, universities, and training centers have a lot of sensitive information relating to students, admissions, enrollments, attendance, faculty, and more. Utilizing AI eliminates the risk of data loss and cyber hacks.

Role Of AI In Academic Management

The one section of individuals, who benefit extremely by adopting AI technology is the academic management personnel (teachers/faculty/teaching staff.) The AI's ability to auto-grade papers, auto-evaluate assignments,

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assign homework, and many more, make it a perfect tool for educators to simplify their job enormously. The capacity of AI doesn't just end there! It enhances personalized and individualized learning by seamlessly integrating with LMS to share study materials, navigate through lesson content, create and view educational videos, presentations, illustration artwork, images, audio lessons, etc. And, at the same time, it allows students to attend tests and exams online on smartphones, tablets, computers, and various other electronic devices.

Moreover, AI innovation encourages eLearning, in order to enhance personalized, blended, competency-based, and differentiated learning methods by making, utilizing and overseeing proper technological procedures and assets in teaching. Additionally, AI in education incorporates different frameworks and tools that emphasize structure, improvement, research and development, administration, and assessment of procedures to ease teaching and learning.

BENEFITS OF AI FOR STUDENTS

24/7 Access To Learning

With AI helpers based online, students always have access to learning. They are free to plan their day without being linked to a specific place. They can study on the go, at any place and time they want. They can build their schedule based on their most productive hours.

Better Engagement

Individualized schedules, custom tasks, interaction with digital technologies, and personal recommendations are part of the personal approach each student gets using AI. Besides, a personal approach helps students feel special, increasing their engagement and raising interest in studies in such a way.

Less Pressure

Lessons tailored to the needs of different learning groups allow students to stop comparing them to each other. Earlier, a student should have asked a teacher for help in front of the class. Now, it's enough to type a query using a personal virtual assistant and get an instant explanation.

These opportunities offered by AI tools make personal progress come to the fore, reducing the pressure in the classroom. Less pressure means less stress and more enthusiasm to study.

How To Start Implementing AI

If you're considering AI as an option to customize the learning experience, these steps will help you to plan your project.

- **Identify your needs and AI technologies**
  The starting point of implementing any technology is the identification of the pain points this technology can address and resolve. Find the system bottlenecks and research the ways AI offers to optimize these processes.
- **Determine the strategic objectives of AI transformation in your organization**
  Determine your appetite: Do you want to be an early adopter or the follower? Which technologies will fit your company best? Are you aware of the AI drawbacks and how are you going to address them? The completion of which business objectives should AI technology contribute to? Based on responses to these questions, you should develop a cost-benefit analysis for AI automation and augmentation.
- **Make the right culture, talent, and technology meet**
  To make the most of the AI tools, you should not only choose the right team to adopt the technology but also create the right environment driven by analytical insights and focused on actionable decisions on all organizational levels.
- **Smart ways to control the outcome of AI transformation**
  Creating an environment for both human beings and AI to work side-by-side, it's important to ensure the processes' transparency and keep pace with the key considerations and metrics of AI adoption. Based on the custom characteristics of your organization and type of AI implemented, decide on the

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performance indicators to track, security concerns to keep under control, and technical ecosystems to support.

Personalized Learning Made Possible With AI

If you're keeping up with the global trends, you know: *personalization is everywhere*. The main advantage of AI is the possibility to train it to perform a long list of tasks, offering in such a way a personalized approach to education. It's a universal solution to get a set of tools tailored to the specific needs of learners and educators to optimize their routine, increase efficiency, improve accessibility, and scale the processes.

Teaching artificial intelligence in schools

The connection between AI and education involves three areas: learning with AI (e.g. the use of AI-powered tools in classrooms), learning about AI (its technologies and techniques) and preparing for AI (e.g. enabling all citizens to better understand the potential impact of AI on human lives). The "Teaching artificial intelligence at school" project currently focuses on the latter two connections. The goal is to contribute to mainstreaming both the human and technical aspects of AI into training programmes for school students. It begins with piloting capacity development of curriculum developers and master trainers from selected national institutions to empower young people.

The following three lines of action are planned for the project:

- Development of an AI skills framework for schools;
- Development and management of an online repository to host curated AI-related training resources, AI national curricula and other key digital skill training courses;
- Workshops to support the integration of AI training into national or institutional school curriculum in a selected number of countries.

To generate all these outcomes UNESCO is supported by an International Advisory Board. The Advisory Board is a group of experts (in AI, education, the learning sciences, and ethics) appointed by UNESCO to develop the AI skills framework for K12 schools and to review the repository and workshop outline. The advisory group donate their time and efforts on a voluntary basis.

UNESCO is currently developing an online repository to provide a hub for Member States who are considering how best to teach their young people about Artificial Intelligence – how it works, how it might be used, and how it might affect humanity. The specific objectives of the repository are to support curriculum designers to upskill in their AI knowledge, and facilitate them to integrate AI skills development modules/courses into the curriculum of schools or other education institutions; facilitate the preparation of (master) trainers; provide openly accessible curated resources on AI in education for all. The repository will soon be available.

The AI training workshops for national or institutional school curriculum is targeted to teachers and curriculum developers. This will be designed by teachers and specialists in curriculum development, artificial intelligence and workshop developers. This project is implemented by UNESCO, currently in partnership with Ericsson, and open to a multi-stakeholder partnership approach.

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