

Artificial Intelligence for Teacher Education And Its Utility in Human Civilization

Ms. Sumana Hazra

Former Student of M.Ed, Institute of Education, Vinaya-Bhavana, Visva-Bharati

Abstract

The paper intends to explore the utilization of artificial intelligence in teacher training programme and its impact on human civilization. This paper also discusses about the vital role of artificial intelligence in education sector as well as the importance of artificial intelligence in human civilization. Artificial intelligence has the potential to revolutionize the education system, promising a better future for humanity. Many educational institutions are already employing different educational software to enhance the skills of the learners. Additionally, artificial intelligence aids in reducing the workload of teachers and administrators, handling both simple and complex tasks efficiently within a very short period of time.

Keywords: Artificial Intelligence, Technology, Education, Human Civilization.

Introduction

Technology helps profoundly in human civilization from the day of carving on rock walls to present day. It helps enormously to influence every aspect of lives such as advancing knowledge and understanding, improving communication and connectivity, enhancing quality of life, driving economic growth, accessing and sharing information. It may be pointed out that information itself is not to be treated as knowledge until it is properly utilized by human beings. Human being uses appropriate information in software to solve various problems of the human being within a very short span of time. So, knowledge could be regarded as human intelligence and Artificial intelligence is artificially used through software to solve the problems instantly without involvement of a huge manpower. Now, it is easily executed by automation technology. In postmodern age (21st century) technologies became more updated gradually and human beings are more benefited through it. Human beings use technologies more often to make the process of teaching and learning more effective, interesting, acceptable and also to save the time. Now-a-days, artificial intelligence which has a great impact on human civilization has become more familiar in our daily life because it can think, act etc. almost same as a human being. In education system, artificial intelligence helps to reduce the huge load of work of teachers and also the administrative works, for example - automatic grading, taking attendance etc. Artificial intelligence also provides innovative educational content and many more.

Objective: To investigate the utility of Artificial Intelligence for Teacher Education in Human Civilization.

Methodology: This paper is mainly based on e-documents, e-journals, e-books, web links etc.

Historical Evolution of Artificial Intelligence

Human beings are always fascinated in their life style. Since a long decade, humans have been making a substantial effort to develop themselves through up gradation to make their life easier since ancient period. Because it has been seeing that human beings are continuously find out the ways to improve and enhance their lives through advancement and innovation to make their live more convenient and smooth. Mainly these are possible only because of their innate curiosity and creative mind.

Some more notable developments took place through the decades are shown below:

Years	Example of Artificial Intelligence
1950s - 1960s	Early Experimentation : “Turing Test”
1960s- 1970s	Computer-Based Instruction: “ELIZA”, “PLATO” (Programmed Logic For Automated Teaching Operations) etc.
1970- 1980s	Expert Systems: “MYCIN”
1980s- 1990s	Knowledge based device: “AI Boom” Self-driving car: “NavLab1”
1990s- 2000s	Hypermedia System: World Wide Web (WWW.)
2000s- Present	Learning Management Systems: “Moodle”, “Canvas”, “Edmodo”, “Google Classroom” etc. Machine Learning: “Artificial intelligence software”, “Robotics”, “Oculus Rift Virtual Reality (Hardware Device)” etc. to enhance reinforcement and experience learning. Personalized Learning platforms (through online): like “Massive Open Online Courses (MOOCs)”, “Coursera”, “edX”, “Khan Academy” etc.

Table: Historical Evolution of Artificial Intelligence

The historical evolution of Artificial Intelligence in education reflects a development towards more adaptive, interactive, personalized learning experiences and better understanding of education. It helps to hold the potentiality to transform education by making learning more accessible, engaging, and effective for learners around the world.

Artificial Intelligence in Education

Artificial Intelligence may challenge the traditional system of education through its exclusive capabilities. It brings an evolution in civilization of human being. Human beings have utilized the artificial intelligence to meet their different purpose of daily life.

<p>ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION</p> <ul style="list-style-type: none"> • INCLUSIVE ENVIRONMENT • MINIMIZE KNOWLEDGE GAP • AUTONOMOUS LEARNING • ACCESS, EQUITY & QUALITY

In education system Artificial Intelligence plays a pivotal role. Important roles of artificial intelligence in education system are discussed in the following:

- 1. Inclusive Environment:** Artificial Intelligence can create an inclusive and provide learners friendly environment in the classroom. Where gifted child, special child, different background learners can definitely participate in this classroom without any hesitation. Through artificial intelligence education becomes more accessible, effective and motivating for all background learners.
- 2. Decrease Knowledge Gap:** Artificial Intelligence has the potentialities to provide huge information in any field and also helps to identify the problems faced by the learners. It can effectively identify the problems and instantly gives solution about it. This is very convenient to the educators and also for learners.
- 3. Enhance Autonomous Learning:** Learners become more autonomous in their learning by using artificial intelligence. In the traditional education system, students are dependent on human teacher or books to remove their confusion or to know more but now learners can easily access to different artificial intelligence software for their education purpose outside of the classroom.
- 4. Access, Equity & Quality:** Artificial Intelligence is very easy to access to everyone. It is very systematic in nature and as a result beginner can access it very smartly. It is very objective in nature because it provides equal treatment to all so there is no chance of subjectivity or biasedness issues. There is no doubt about its quality because artificial intelligence always offers updated, creative and authentic information to the users.

These are the important roles of artificial intelligence to make the education system more effective and qualitative in nature. But it holds the potential to transform education by making learning more accessible, equitable and effective for learners all over the world.

Teacher Education

The basic aim of teacher education is to prepare future educators. The teacher education programme is of two types one is Pre-Service Teacher Education and another is In-Service Teacher Education Programme. Teacher education programme have several aims, towards preparing future teachers or educators who can positively impact students' learning process.

Some of the key aims include:

- a. Developing pedagogical knowledge and skills.
- b. Understanding educational theory and research.
- c. Fostering reflective practice.
- d. Promote diversity and inclusion.
- e. Encourage lifelong learning.
- f. Building collaboration and communication skill.
- g. Promote ethical and professional conduct.
- h. Preparing teachers for leadership goals.

Teacher education Programmes follow a structured format that includes the following components:

- a. Admission process
- b. Pre-service and in-service training
- c. Practicum or Field experience
- d. Student teaching

- e. Pedagogical training
- f. Content specialization
- g. Assessment and evaluation
- h. Professional development
- i. Certification requirement

The aforesaid basic structural components are maintained manually in Teacher Education Programme, which is time taking, excessive workload, more chance of mistakes in evaluation process, lack of responsibilities to provide certificate, taking assessment in a proper time etc. In order to reduce and simplify multivariate problems, Artificial Intelligence has the capacity to decrease the load of work of educators and administrators. It is important to recognize that teachers play a crucial role to provide individual support, develop critical thinking skills, and nurturing socio-emotional development in the students. Therefore, the integration of Artificial Intelligence should be thoughtfully implemented to complement, rather than replacement of human teaching expertise. Additionally, considerations around equity, privacy, and ethical use of Artificial Intelligence in education must be carefully addressed to make sure that learners are benefitted from its successful implementation.

Utilization of Artificial Intelligence in Teacher Education Programme

Artificial intelligence is the matured software; it emphasizes different cognitive skills such as learning, reasoning, understanding, problem solving etc. like a human brain. So, artificial intelligence may achieve the sustainable development goals (2030 agenda) number 4 which ensures inclusive and equitable quality education and also promotes lifelong learning facilities to all. There are different ways to implement artificial intelligence for education purpose which helps learners to learn quickly. In addition to that, teachers and administrators are also immensely benefitted from it to facilitate the process of evaluation process easily. In Teacher education Programme, artificial intelligence can play a significant role in preparing future educators for the challenge of modern classroom. Applications of Artificial Intelligence in teacher education Programme with benefits are discussed below:

Teacher Education Programme	Examples of Artificial Intelligence	Benefits of Artificial Intelligence
Simulated Teaching Environment	“Hurix Digital” “Adobe Captivate” “Articulate 360” “Atomi Active Presenter 8”	<ul style="list-style-type: none"> • Create realistic virtual classroom. • Real time feedback • Create various classroom settings and situation • Reflection and debriefing
Lesson planning	“Click UP”, “Open AI” “Lesson Plans.ai”, “Learnt.ai”, “Technology.ai” “Auto classmate” “Jasper” “Planif AI”, “Curipod” etc	<ul style="list-style-type: none"> • Personalized learning plans. • Recommends for instructional resources, activities and materials according to pupil teacher needs. • Progress monitoring • Provide reflection and feedback.

Teacher Education Programme	Examples of Artificial Intelligence	Benefits of Artificial Intelligence
Micro teaching	“Mursion”	<ul style="list-style-type: none"> • Provide spoken dialogue with five virtual avatars at a time. • It controls: body language, facial expression, lip synchronization.
Work education and co-curriculum activities	“Virtual Labs”	<ul style="list-style-type: none"> • Enhance understanding and practical skills.
	Language Learning Apps (“Chatbot”: “Alexa”, “Duolingo Bots”)	<ul style="list-style-type: none"> • Students’ progress through language practice.
	“Robotics Kits” <ul style="list-style-type: none"> ➤ “Makeblock mbot” ➤ “NAO” ➤ “OWI535” ➤ “LEGO MindstormsEV3” ➤ “Robo Wunderkind” 	<ul style="list-style-type: none"> • Developed Hands on experience, creative, problem solving, collaboration skills. • Teaches any subject from primary to university level. It acts like a human being. • Majorly developed Technology used for Secondary level school students. • More advanced robot mainly designed for children over the age of 10 years. This robot has the ability to move, shoot, crawl and many more functions. • A fully functioning Robot. Basic functions of it are to react to noise, to move around a room, to avoid obstacles etc.
	Grammar checker, plagiarism detector	<ul style="list-style-type: none"> • Error free, creative writing aides.
	“Virtual reality”	<ul style="list-style-type: none"> • Virtual Field Trips simulate real world environment.
Achievement test	“EdApp” “OpExams” “Questgen” “Testportal”etc	<ul style="list-style-type: none"> • Adaptive testing • Real time feedback • Data analysis • Can assess students’ ability and learning needs.

Importance of Artificial Intelligence in Teacher Education Programme and Human Civilization

1. **Revolutionizing Education:** Usage of Artificial intelligence can convert traditional education model and it provides a personalized, inclusive, and adaptive learning experience for students.
2. **Enhancing Learning Outcome:** Artificial intelligence in education is utilized by educators to identify gaps in students’ knowledge and provide tailored feedback to enhance learning feedback.

3. **Student Engagement and Autonomy:** Artificial intelligence driven “Chatbot”, “Robotics”, “Virtual Assistance” etc. empower students to actively participate in educational content and promote autonomous learning, ultimately leading to success and growth.
4. **Restructuring Educational Administration:** Artificial intelligence enhances virtual classrooms, automating tasks such as homework assessment, test grading, report organization and many more administrative works.
5. **Empower Classroom Potential:** Artificial intelligence powered platforms can serve valuable assistance in the classroom.
6. **Efficient Resource Management:** Artificial intelligence helps to optimize resource allocation in educational institutions. It confirms that educational possessions are being utilized properly.
7. **Task Automation and Time Liberation:** Artificial intelligence can efficiently handle repetitive tasks. It also liberates valuable time for teachers and administrative staff.
8. **Empowering Multifaceted Benefits of “Chatbot”:** The Artificial intelligence powered platform, “Chatbot” finds its utility in the school with a view to reduce the need of additional support system like staff, teachers etc. It is cost effective, more accessible and it provides affordable education to all. It also ensures inclusive environment through multilingual facilities to the students. “Chatbot” promotes interconnections and helps to enrich educational experience for globally diverse students. “Chatbot” can comprehend students’ sentiments and promptly address the students’ doubts. It has both message and voice commands. It is designed to work without any assistance of human operator. It collects lots of data about users to track their activities so as to solve their problems as and when required through a web or mobile application. It provides virtual assistance to the users. It has ability to provide immediate clarifications to the teachers and to make more conducive and effective learning environment.
9. **Elevating Education through “Robotics”:** The Artificial intelligence powered platform, “Robotics” plays a significant role not only teacher education system but also full gamut of education system and human civilization all over the world. Robotics helps the learners to make them understand the complex subjects like computer, Programming and different skill based subjects. It is implemented in education system from elementary level students to university level students. It has those potentialities to make things more efficient, safer and high quality. Robotics can enhance critical-creative thinking, innovative learning, and provide opportunities for diverse learners in the classroom. It is more energetic, efficient and easy to use. In the academic institutions where some of the teachers are found less energetic and have lack of efficiency, the Robotics may be utilized to solve the problem. If a Robot becomes out of order, it can be repaired to make it functional as before.
10. **Transforming Education with “Virtual Reality”:** The Artificial intelligence powered platform, “Virtual reality” empowers teachers’ ability to think beyond the conventional teaching process. Learners can explore and also interact with the virtual objects which are not imaginable in the physical world. Virtual reality provides a very interesting way of smooth learning .As a result; information retention power becomes more in comparison with general classroom. It also helps to build learners' confidence since they practice things beforehand and become familiar with the surroundings afterwards. Through this immersive learning experience is obtained, students are getting inspired and also encouraged for creative imagination. Learners get learning by doing environment. Virtual reality provides a both visual and kinesthetic experience so that students can

achieve an effective experience and remember it better than a traditional classroom system. It ushers a safe environment to the learners to practice new skills. It is cost-effective because teachers can organize a field trip through it which gives a virtually real life experience and as a result, it reduces extra costs like transportation, accommodations etc. It gives an immersive experience to the learners and they remain fully engaged within the virtual learning environment. As a result, they remember things for a long time and comprehend better. It provides a 360-degree digital environment which is like a real world.

11. **Enhance Educational Process:** Educational institutions are benefitted from Artificial intelligence, which helps researchers and teachers for conducting teaching and learning process smoothly.
12. **Revolutionizing Visual Learning:** Conventional education system needs visual aids beyond interactive laboratories. Web-based learning environment can help to feel realistic and immersive through the use of artificial intelligence. With the use of this technology, students can experience immersive 2D and 3D visualization that provide a variety of viewpoints to improve understanding.
13. **Dynamic Learning:** Artificial intelligence always provides regularly updated information, ensures their relevance from time to time, and also provides up-to-date content notifications to the users.
14. **Ensuring Integrity in Online Exam:** Artificial Intelligence can proctor online exams. Prevent cheating and minimize the work load of educators.
15. **Promote Objectivity and Equity:** It offers an equitable examination environment and fair evaluation process to the learners.
16. **Student Record Management:** Artificial Intelligence can organize, update, and secure records of students through automated data management system.

Drawbacks of Use of Artificial Intelligence in Teacher Education Programme and Human Civilization

Sl. No.	Basis	Drawbacks
1.	Expert gap	Lack of experts to regulate the Artificial intelligence and to repair if it becomes out of order.
2.	Threat of Hacking and Malware	Hacked issues (like malware) are more common problem in this area.
3.	Absence of emotional bonds	No emotional attachment like a student-teacher relation.
4.	Challenge of affordability	High quality Artificial intelligence is expensive; not affordable for all educational institutions.
5.	Hindrance in infrastructure	Lack of infrastructure in educational institutions to avail Artificial intelligence properly.
6.	Shortage of specialized educators and resources	Less specialized and knowledgeable educators and resources in the institutions.
7.	Absence of human touch	Lack of human touch, students can't get real human interactions.
8.	Replicate inability	Artificial Intelligence offers realistic environment but can't replicate unique style of a human being.
9.	Insufficient or inaccurate	Totally data dependence, so insufficient or wrong data may provide wrong outcome.

10.	Aggravate of risk	Artificial Intelligence may be harmful for human if there is absence of proper regulation.
11.	Power consumption barrier	It consumes huge amount electricity, which is hindrance in remote area.

These drawbacks require to be removed by thoughtful consideration of ethical, social, and economic implications alongside proactive measures to mitigate risk and ensure responsible development and deployment of artificial intelligence technologies.

Conclusion

Now-a-days, digitization has become a backbone of human civilization. The idea of “Digital India” also aims towards the digital empowerment of the whole country in the context of technology. The excessive and growing usage of technology is being found (such as Artificial intelligence, Drone, virtual reality, augmented reality etc.) in different education sectors and also in human civilization. Artificial intelligence gives new life to the field of the digital world. In the ancient period, the idea of education was narrow, called “gold sack theory,” but gradually it becomes a broader concept that defines a lifelong process of education. Now, education institutions are more advanced through digitization and different advanced software simultaneously. Artificial intelligence is no doubt a blessing in human civilization if we could overcome the drawbacks as specified above.

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