Advanced International Journal for Research (AIJFR)
E-ISSN: 3048-7641 ● Website: www.aijfr.com ● Email: editor@aijfr.com

Emerging Trends in Education seen through the Lens of Artificial Intelligence

Dr. Sr. Candy D'Cunha[1], Mrs. E. Kalavathi[2]

[1]Research Scholar, Apex Professional University Pasighat - Arunachal Pradesh
[2]Assistant Professor of English, Andhra Loyola Institute of Engineering and Technology, Department of English

Abstract

The Post Covid-19 era proliferates to ensure that Artificial Intelligence (AI) has a strategic value in education. AI is one of the best tools for teaching and learning which can perform miracles and lighten the burden of teachers and students. Artificial Intelligence was a term coined at a workshop at Dartmouth College in 1956. Ever since, AI has picked up great momentum and has soared up to great heights with good predictions which has been punctuated by periods known as AI winters.

In the era of rapid progress and development of Science and Technology, the connection between AI and Education has been hailed as a response to many education problems. Since AI has no rigid boundaries, the concept of AI broadens the purpose for what it is used and by whom it is used.

Along with emerging technologies in the realm of digitalization of educational resources through podcasting, gamification and blogging, AI paves the way for exploring a number of opportunities for the development of its applications and its prominence in Education. Modelling potential of AI techniques has been exploited systematically by educationalists through reactive and adaptive tutorials for creating individualized learning environments. There are several benefits to intelligent tutoring system which can be effectively used in the educational scenario. AI is a great boon to our humanity as it makes education highly impactful. However, it has its own challenges for it can't substitute the integral human person. This paper is an attempt to explore the emerging tools through the lens of Artificial Intelligence.

Keywords: Education, Artificial Intelligence, Adaptive tutorials, boon, challenge, human person.

1. Introduction

The Post Covid-19 era proliferates to ensure that Artificial Intelligence (AI) has a strategic value in education. J. Loeckx, in his book Blurring Boundaries in Education: context and impact of MOOC'S, (2016) suggests that AI is the best tool which can perform miracles and lighten the burden of teacher and students. The Council of Europe's Committee of Ministers-2019, noted that AI has an impact on Education which in fact can explore opportunities, and at the same time it can threaten the education scenario with numerous replacements.

In a report prepared by the Council of Europe Inter-governmental project on AI and education, it defines AI as:

A set of sciences, theories and techniques whose purpose is to reproduce by a machine the cognitive abilities of a human being. Current development aims, for instance to be able to entrust a machine with complex task previously delegated to human (Council of Europe 2021).

Artificial Intelligence was a term coined at a workshop at Dartmouth College in 1956. Ever since, AI has picked up great momentum and has soared up to great heights with good predictions which has been punctuated by periods known as AI winters. From the earliest day, the researchers on AI focused on two parallel approaches: Firstly, symbolic artificial approach that focused on encoding principles on human reasoning which is further elaborated as encoding the knowledge of experts. In other words, it is also called as expert system. This symbolic approach is also called as 'rule based' or 'good old-fashion' AI approach. The second approach, also commenced at the same time, focused on the structure and function of human brain (neurons) and draws inferences from usually large amount of data.

Symbolic artificial intelligence was popular in 20th century but its progress was hindered by multiple roadblocks that led towards AI winters. In 21st century, Machine Learning (ML) has become dominant. A huge amount of data is mainly derived from the internet. The most dramatic achievement of ML is AI, which has a specific feature of automatic translation between languages. The ideas of AI in education are not about humanoid robot, in other words, to replace human teacher with a robot but its all bout using computer intelligence efficiently in order to make teaching and learning effective.

In the era of rapid development of science and technology, the connection between AI and Education is hailed as a response to any education problem, namely: Lack of qualified teachers, learning gap between slow learners and advanced learners, students under achievements etc.

The concept of AI gives a call for a purpose for what it is used and by whom it is used. Since AI has no rigid boundaries, it has been grouped into four headings. "Learning with AI", "Using AI to learn about Learning", "Learning about AI and preparing for AI" and "preparing for AI" (Holmes et al. 2019).

Learning with AI: AI driven tools are involved in teaching and learning, which includes:

- Dialogue based tutoring
- Exploratory Learning Environment
- Automatic Writing Evaluation
- Chatbot
- Learning Network Orchestrators

The use of AI can also support administrative system which involves timetable, recruitment and Learning Management System. The use of AI by the teacher supports her to use AI driven tools for effective teaching and learning, mainly through smart digital based materials.

Using AI to learn about Learning: Strictly speaking, AI is not always to be understood as some kind of automation, but it involves the analysis of the same or similar data to learn about how the learners learn and perform in the given tasks. This method is used to inform learners', stakeholders and teachers about

retention ratio of students and admission support programme planning. In other words, this can also be called as education data mining.

Learning about AI: All ages of learners can have access to learn about AI. This includes learners from primary education to secondary education. Hence, learning about AI as AI literacy, the technological dimensions are essential.

Preparing for AI: As the advancement in science and technology goes up, the need to prepare for AI and possible impact on one's life is essential. This preparation should be integrated with the notion of learning about AI which automatically can lead to preparing for AI.

Artificial Intelligence in education (AIED) is one of the currently emerging fields in educational technology. Whilst it has been around for about 30 years, it is still unclear for the educator how to make pedagogical advantage of it on a broader scale and how it can actually impact on meaningfully teaching and learning (Zawacki - Richter et al. 2019:1).

Along with emerging technologies in the realm of digitalization of education resources such as podcasting, gamification and blogging, AI paves the way for exploring a number of opportunities for the development of its applications and its prominence in education.

For instance, modelling potential of AI techniques has been exploited systematically by the educationalists through reactive and adaptive tutorials for the individualized learning environments. This modelling potential technique of AI can compensate for the shortage of teachers and many more things through the use of intelligent tutoring system. The following are the benefits of intelligent tutoring system:

1. **Monitoring Students' Performance through Automate Basic Activities**: Many activities in education system are time taking. These activities consist of home works, grading test, assignments etc. All these tasks are time consuming. With the use of AI tools, many automate basic activities can be conducted. Grading system can be automated and the teacher in fact, can utilize her time to solve the doubts of learners more effectively and more vibrantly. Some of the activities like multiple choice questions, short answers, fill in the blanks can be conducted through automate basic activities. Even though AI cannot replace the teacher, still it paves the way to save ample time which can be prioritized for better learning and clarifying. The AI based tool to performed the above activity is as follows:
Big Data - Tool for analyzing the performance of a learner: Big Data enables to analyze, help and understand the performance of a learner. This tack of performance can be done both at Individual and collective level. The generated grades of students' performance will enable the teacher to fully understand the areas of interest among students.

2. **Delivering Suitable Task through AI Tutor**: Teachers cannot be available with the student after the college hours. Students are expected to clarify their doubts only during the class hours. On the other hand, it's not possible for every child to grasp the entire concept in one or two classes. Due to the difference in graded level, the ability of a learner may at times make the students to lack confidence and to approach a teacher and clarify his doubts. In order to reach out to the students even after the college hours, various AI driven tools are available. The fundamentals of subjects like Mathematics and other subjects can be taught through these activities. As of now, AI cannot fully replace a professor or to a complex way of

learning. In the future, AI will solve even the complex problems that requires reasoning and analytical thinking. The tool to conduct the above activity is as follows:

Chatbots – It is a tool to respond automatically through a message: Education Chatbots are well designed to use it effectively on the virtual forum. This tool enables teachers to answer all the common queries and provide them with course material, mapping students' progress and evaluate individual feedback. Chatbots are teachers' prefect assistant and play a vital role.

3. **Providing effective feedback with AI driven programmes to teacher and students**: The job of AI is not only to deliver customized courses as per their requirement but also to give genuine feedback about their performance. Now a days, some online courses conducted by reputed universities are using feedback-based AI system. These types of AI-driven system tools can enable students to obtain a genuine and personal feedback on their performance, and at the same time, AI– driven system can help the teacher to revive the critical performance of a learner. They can also obtain true support in the areas of their teaching. The tool for the effective feedback can be done through:

Dialogue Based Tutoring System: It is an artificial driven tool which engages learners in discussion and it can be spoken or typed.

4. **Changing the role of the teacher:** Even though the teacher has a specific role to perform in the class room, still the role of a teacher can be changed due to the availability of technologies. As AI can automate different tasks for a learner, so also AI can make available a real-world tutor in some cases. AI system can be programmed for clarifying doubts and could even teach basic courses in place of a teacher. The above activity can be performed through:

Embodied AI and robotics: They are movable machines which can automatically perform tasks with the help of machines or robotics.

5. **Personalize education with AI:** The main aim and objective of AI is not to replace the teacher with a robot, but rather to render a helping hand to a teacher and make her teaching effective and meaningful. Programmes can be designed with the help of AI systems. With personalized learning, students can have their learning at their own pace. The teacher can cater to the needs of a learner through a well-designed study plan. As there is rapid advancement in AI, the machine can even identify the facial expression of a student and provide an explanation to their doubts and queries. Even though such things are not available in the current scenario, in the future this may be possible.

The above activity can be performed through:

Exploratory Learning Environment: This tooI encourages learners to construct their own knowledge by discovering and deploying elements of the learning environment.

6. **Creating and Generating Smart content with AI:** It is very much possible to create and generate smart content with AI. This can be done in three ways, namely:

Digital lessons: Nowadays, students prefer digital material in the colleges. These materials consist of study guides, e-books, short videos and many other e-resources. Libraries have turned in to digital learning centers to issues e-books for reading and reference. This can be done through **Educational Data Mining** which has many tools and possibilities for generating a smart content.

7. **Information through Visualization:** The other technique of smart content is through information visualization. AI can perceive new ways to stimulate web-based study environment. Since Visualization is better than listening, this technique can help the learner for a better understanding of a subject. **Learning Network Orchestrators:** AI driven tool that empowers and support network of people.

The need of AI is growing day by day due to various demands and challenges faced in the current globalized era. The usage of AI is adapted in various spheres of life. In the education scenario, the influence of AI is working as an essential and helpful tool, both for the teacher and for the students. It has been noted that the usage of AI is not adapted by all the educational institutions. Gradually, in the future, AI will have a good impact on the education sector due to several benefits, such as: 24x7 access to learning, less pressure, better engagement, etc. Such benefit will explore the future possibilities in the areas of Performance Personalization, Violation Bias and combined Assistance.

The world's citizen needs to understand what the impact of AI might be, what AI can do and what it cannot do, when AI is useful and when its use should be questioned and how AI might be steered for the public good (Miao and Holmes 2021 a:6)

AI and Confronted Challenges in Education:

AI as a promising field is complex and intricate when it is connected to its application in Education system**.** These challenges are due to the AI techniques displayed and predicted by educational domain in the realm of smart computation. Since the AI techniques have been designed for a particular domain in general, it fails to serve the specific need of a particular domain. Horizon report 2018 describes the 'reconceptualization' of the role of the educator. On the contrary, the AI may provide students with smart and efficient tools for learning, which may distract them for doing normal tasks assigned by teachers.

Conclusion

AI has achieved great strides over the years due to the ethical issues brought by AI which are challenging both to the researchers and educational practitioners. AI is a great boon to our humanity which makes education highly impactful. AI is currently transforming industry and it is yet to show its true potentials in education. Thus, learning from computer system can be of great help but it is not possible to fully replace a teacher in schools and colleges.

However, it has its own challenges for it can't substitute the integral human person. The research trends of AI in education through the technology adoption of Internet of Things (IoT) is not explored much in education. The IoT techniques in education will be the future area of research (Horizon Report: 2019). This paper is an attempt to explore emerging tools through the lens of Artificial Intelligence.

Works cited

1. Seldon and O. Abidoye, Th fourth Education Revolution, University of Buckingham Press, London, UK, 2018.
2. Harley J.M., Lajoie S P, Frasson C and Hal N.C (2017) Developing emotions aware advanced learning technologies: a taxonomy of approaches and features, Springer International Publishing https:// doi.org/10.1007/978-3-030-10576-1_107.
3. Holmes W. Bialik. M and Fadel C. Artifical Intelligence in Education, promises and implications for teaching and learning, Centre for Curriculum Redesign, Boston, MA 2019.
4. J. Loeckx, Blurring Boundaries in Education: context and impact of MOOC'S, The International Review of Research in Open and District View, vol ,17, no3 pp. 92-2212016.
5. Luckin R, George K. and Cukurova M. AI for school teachers, CRC Press, BocaRaton, FL, https:// doi.org/10.1201/9781003193173. 2022.
6. Rose, C. P., and Jordan, P. 2000. Interactive conceptual tutoring in atlas-andes. In Proceedings of AI in Education 2000 Conference.