

The Role of AI (Artificial Intelligence) in Education: A Predication

Dr. Dattatray M. More

Assistant Professor of English

Ujwal Gramin Mahavidyalaya, Ghonshi, Tq. Jalkot Dist. Latur

Abstract:

Innovative educational technologies have revolutionized teaching and learning methods. Recently, with advances in artificial intelligence, higher education has begun to adopt new technologies. This conceptual review paper aims to investigate the emergence of artificial intelligence in education teaching and learning. It examines educational the consequences of emergent technologies on how institutions teach and students learn. This study aims to predict the role of artificial intelligence (AI) in education in the future world. Effective application of artificial intelligence methods is considered to be a means of improving the quality of improving the teaching and learning quality. However, the challenges of integrating artificial intelligence (AI) in educational institutions are addressed. Moreover, the challenges faced in terms of students' support, teaching, learning, and adoption and administration are also discussed.

Keywords: *Artificial intelligence, augmentation, higher education, machine learning, teaching, teacherbots, etc.*

1. Introduction

Education is the key tool for socio-economic development of individuals. It empowers them to learn as well as grow, get their dream jobs and improve their quality of life through skills, knowledge etc. (Gaikwad, 2014). Higher education has a fundamental link with advances in innovative technologies and the high computational capacities of intelligent machines. Hence, the field developments of artificial intelligence provide new opportunities and challenges for teaching and learning in education the context of higher education; moreover, artificial intelligence has the potential to effective changes to the core design of higher education institutions. There is no ultimate definition regarding the concept of artificial intelligence among philosophers since Aristotle. The aim of this review study is to analyze the applications of artificial intelligence in teaching and learning. This conceptual review paper categorizes the articles according to the concepts and themes of integration of AI into education. It identifies the current 'understanding' of AI application in current educational systems discusses not only the advantages of AI applications, but also the challenges associated with the integration of AI into education (Williamson, 2024).

2. Background of Study

Artificial intelligence (AI) is defined as computing systems that engage human-like processes, such as learning, adapting, synthesizing, self-correction, and use of data for complex processing tasks. In 1950s, scientists started to investigate artificial intelligence

solutions. The first solution to the problem of when a system is considered ‘intelligent’ was proposed by Turing (Russell & Norvig, 2010). He suggested the simulated game to test the capacity of a human listener to distinguish between a dialogue with a machine and another human; if the system fails to detect this difference, we would admit having artificial intelligence (AI). Later in 1956, John McCarthy offered the most comprehensive definitions of artificial intelligence: “AI is the basis of the assumption that every aspect of learning or any other feature of intelligence can be described precisely the property of machine or program; the intelligence that the system demonstrates” (Kerr, 2017).

When it comes to the definition and application of artificial intelligence, most approaches only put emphasis on cognition and they just disregard other political, philosophical, and psychological aspects. The basic definition of artificial intelligence is based on the revision of past studies in the existing literature (Dacre Pool & Qualter, 2012).

3. Objectives of Study

The following objectives are predefined for the present study:

- To study the background, scope of artificial intelligence within education context
- To identify the major challenges while adopting artificial intelligence in education
- To explore the opportunities after adopting artificial intelligence in education

4. The Development of Artificial Intelligence in Education:

Artificial intelligence (AI) is defined as tools or instruments used extensively in different cities or campuses all over the world. They include some technologies like smart phones, internet, search engines, different apps, and household appliances. Artificial intelligence that everyone faces in everyday life, is the complicated set of software in the iPhone’s Siri (Shulman & Bostrom, 2012). Although it can be considered as AI with low complexity, it is labeled as an artificial intelligence project in America since 2001. In 2007, the apple company used this application in iPhone operation system. Nowadays, AI can be used by Google for its search engines. Moreover, AI is used in the engine, breaks, and navigation systems of all new cars. Self-driving technology is a top priority for development in some well-known companies like Volvo, Google, and Mercedes (Beam & Kohane, 2016). This technology was first used on trial in Australia in 2015. Noticeably, self-driving technologies are using in mining corporation. In addition, self-driving trucks are used for different main reasons in Australia (Hillier, 2015).

Technologies enable the students to learn at their own place, develop various emerging skill-sets (Gaikwad, 2016). The students are placed in the center of learning challenges and teaching. Human–AI interaction is considered a kind of solution or collaboration that can assist people with disabilities around the world. Thus, these technologies can inspire the following: people in higher education to take advantage of AI. It can motivate both learners and teachers to be more engaged in the learning and teaching process. Investing in AI can affect academic settings. Perhaps the economic problems for students of higher education are good reasons to seek AI solutions (Porayska-Pomsta, 2024).

Artificial intelligence (AI) approaches have the ability to develop and imitate the decision-making process adopted by people. Different AI techniques have been developed use in adaptive education systems. These techniques can also be referred to as fuzzy logic Decision Trees, Bayesian Networks, Hidden Markov Models, Neural Networks, Genetic

Algorithms. However, to date, there has been no consensus regarding the creation of a standard approach to determine which technique has the most suitable AI learning theory to apply for a particular learning environment. Moreover, scientists have not yet developed software tools to facilitate the determination of the learning style based on students' learning behavior. What is required in this study learning and teaching is a tool that is easily configurable and accessible in various learning environments, such as traditional and eLearning environments.

In educational systems, educational goals can be better achieved and managed through artificial intelligence (AI). Using AI, instructors can analyze students in a class and recognize who is a slow learner to understand the topics. If a student has some weaknesses in certain areas or he/she fails to understand a few topics. Therefore, AI analysis would showcase this report to lecturer or parents, then the lecturer can take appropriate action to scaffold learning. In addition, artificial intelligence has the potential to draw attention to which topics of courses need to be improved, since lecturers may not always be aware of the gaps in their knowledge.

The classes can be tailored according students' profile and interests can be stimulated by exposing them to various content and courses. In addition, AI can assist lecturers with homework tasks. For an instance: Coursera, which acts as an enormous open online course provider, evaluates students' response to a problem. As Coursera found that a large number of students submitted the incorrect homework answers, the teacher is alerted through the system, and the system gives a message offering clues to the right answer to prospective students. The AI system contributes to provide an explanation of the courses, and to ensure that all students are building the same conceptual basis. Hence, lecturers with the ability to employ technology in their teaching strategies can gain the following: advantages of automatic data created from students' engagement. Since these digital information systems are prone to quickly store and process huge amounts of information in a short time. In addition to these specialized algorithms, these systems can identify the level of students' engagement and make sense of their teacher's behavioral patterns that appear class and could inform the teacher about these results. The application of this technology lecturers to appropriately manage their classes and they can spend less time on paperwork spend more time obtaining invaluable insights from AI tools to deliver higher quality research-informed teaching. In this paper, only a few tools are explained that will shape the future application of AI in educational contexts.

5. Discussion:

• Artificial Intelligence Can Automate Grading in Educational Context:

Grading homework and tests usually takes a significant amount of time. This time could be used to work on professional development, interact with students and prepare for class. As AI might not truly replace human grading, it's about to replace human grading. AI automated grading is able to grade nearly fill-in-the-blank and all kinds of multiple-choice testing. However, essay-grading software is still in its early stages yet and it will be improved over the coming years.

• Students Receive Supplementary Support from AI Tutors:

It is obvious that human tutors are able to teach certain subjects that machines cannot teach; however, students will be tutored by artificial intelligence machines. Currently, there

are tutoring programs that are based on artificial intelligence to help students improve their writing basic mathematics, as well as other subjects. These AI programs can only instruct students in basic subjects; however, these machines are not perfect for teaching high-order thinking and creativity to students. With the rapid advancement of technology, advanced tutoring systems may not be an unattainable dream.

- **AI programs can provide constructive feedback to students and lecturers:**

AI has the potential to provide feedback to lecturers and students regarding the success of the course. Some schools employ artificial intelligence (AI) systems to track and monitor students' progress and to notify professors if there is an issue with students' performance. Moreover, these AI systems provide students with the appropriate support and to provide professors with feedback to improve the instruction in related subject matter.

- **Artificial Intelligence Can Alter the Role:**

As mentioned above, AI is able to take charge of various tasks such as grading, giving constructive feedback on students' performance. In addition, they might even be a substitute for teaching. They can be programmed to provide knowledge, to ask questions, and find information about very basic course materials. However, in several cases of AI application in education, AI has shifted the role of teacher to facilitator. Teachers can integrate AI lessons as supplementary materials to assist weak students and provide hands-on experiences in the form of student human interaction.

- **AI Less Daunting the Trial-and-Error Learning Process:**

AI systems have been designed to assist students in the process of learning; in this context, the trial the error process is much less intimidating to students. Since AI systems provide students with a fairly judgment-free environment of learning, as AI tutors can suggest solutions to students' performance. AI is considered an optimum learning system because AI itself often learns through a trial-and-error method. Finally, AI systems can change the way students learn and help them to develop basic skills. In fact, artificial intelligence is about to fundamentally change the learning process in educational contexts. Artificial intelligence programs substitute particular types of classroom instruction by providing support for students from anywhere in the world at any time. In addition, in the future, an AI system could replace lecturers in some subjects. Currently, some educational programs are equipped with artificial intelligence (AI) to scaffold students to learn basic skills. However, as AI program developers are advancing, AI is more likely to provide students with an extensive range of services. AI systems provide this level of insight not only to save time, but also to provide teachers with more detailed information that may not be obvious or possible for teachers to identify. Classroom AI systems have a high capability for analyzing multiple sources of data and comparing these data to the known patterns. They are able to recognize the source for problems and also give guidance for lecturers to achieve more consistent outcomes across classes.



(Source: Luis Palma Pires, 2023)

6. Challenges of Artificial Intelligence Solutions:

Based on an in-depth literature review, we identified the following challenges in implementing AI systems into educational systems:

Cost: The provision of initial outlays for software and cloud support is very costly for educational systems. In addition, if organizational processes change, not only continuous employee training but also ongoing AI system training would be expensive.

Culture clash: Organizations might have considered any changes suspicious. Since there are several technology options; therefore, it is difficult to determine the most appropriate implementation path to restrict the potential options.

The application of artificial intelligence (AI) has been a very attractive solution in education systems. In Moreover, there are other reasons for the application of AI, such as the large number of students and broader financial pressure. Another problem faced by the lecturers was the students with different rates of progress or different fundamental skills for the courses that they have taken. How to help students to increase their learning activities obtain desired results, perform the assessment, and provide constructive feedback as unresolved problems. The observation in Teacherbot was made by Sian Bayne revealed that Interventions in Automated Teaching, “are driven by a productivity-oriented solutionism,” not by pedagogical reasons (Ferguson et al., 2015).

One lesson that merits attention is MOOC. In 2008, MOOCs were used for the first time in Japan After that, we heard about the changes that occurred in higher education. Outcomes of the study research on this issue have revealed the failure of MOOCs to meet the participants’ expectations. An important issue, however, concerns some irrational and unreserved ideas that surround them MOOCs when decision-makers failed to consider key principles such as evidence-based arguments or academic skepticism. Moreover, they were not interested in learning and they were just thinking about the financial profits (Popenici, 2013).

Another problem faced by the lecturers was the fact that the students progressed at different rates or had different basic skills for the courses they had taken. How to help students to increase their learning activities to obtain desired results, conduct assessments,

and provide constructive feedback remain unresolved issues. The observation in Teacher bot was made by Sian Bayne revealed that Interventions in Automated Teaching, “are driven by a productivity-oriented solutionism,” not by pedagogical reasons (Ferguson et al., 2015).

The development of machine learning and artificial intelligence in higher education institutions has made some possibilities and challenges. However, it is essential to consider that education is not a technology-centric solution, but a kind of human-centric effort. In spite of a quick advancement in artificial intelligence (AI) is not correct solely dependency on technology. Therefore, it is essential to focus on the idea that human beings themselves should recognize problems and risks. In addition, they should ask some important questions about privacy and control of fostering creativity requirement. Moreover, they should leave the door open for serendipity paths in the process of learning and teaching (Council, 2011)

The reason for AI is like a panacea in higher learning, leaving those who are in the path of reality. However, an important issue in education is maintaining academic skepticism. Generally speaking, we need to consider this objective to nurture responsible citizens and educated minds.

The rapid advancements of artificial intelligence can be doubled by universities trying to find economic solutions to stabilize the budgets. In education, a number of teaching assistants have the ability to administrative staff. Therefore, exploring the impact of these factors on learning is very essential. These impacts will be significant, especially in situations where there is a need for initiative and creativity among graduates. Enhancing human thinking and increasing the teaching and learning process is the main aim of technology in education. With the increasing application of AI, it is essential for academic institutions to be informed of whether controlling over algorithms is not monopolized by tech-lords. To Pasquale (2015), making decisions should be made automatically based on human reflection (Secundo, Vecchio, & Passiante, 2015).

7. Conclusion:

Increasing the use of AI is not a reason to disregard the profound debate about the role of teaching and learning in education. Advancements in technology and job creation displacement, however, it indicates that teachers’ role should be Taking advantage of AI or IT solutions to recognize plagiarism can raise this question: who is responsible for teaching and learning. These solutions provide opportunities for teaching and learning, while at the same time supporting learning can maintain the fullness of central values and the aim of higher education. Finally, there is a requirement for conducting research on the application and improvement of artificial intelligence and the ability to increase human knowledge. Finally, it is essential to consider concentrate on the new role played by the teachers, insisting on the same factors such as creativity, imagination, innovation, and skills that can scarcely be performed by the machines.

References:

- Beam, A. L., & Kohane, I. S. (2016). Translating artificial intelligence into clinical care. *JAMA - Journal of the American Medical Association*. <https://doi.org/10.1001/jama.2016.17217>
- Dacre Pool, L., & Qualter, P. (2012). Improving emotional intelligence and emotional self-efficacy through a teaching intervention for university students. *Learning and Individual Differences*. <https://doi.org/10.1016/j.lindif.2012.01.010>
- Ferguson, R., Clow, D., Beale, R., Cooper, A. J., Morris, N., Bayne, S., & Woodgate, A. (2015). Moving through MOOCs: Pedagogy, learning design and Patterns of Engagement. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. https://doi.org/10.1007/978-3-319-24258-3_6
- Gaikwad, S. R. (2014). The Role of Values in Unforeseen Circumstances of Business. *IOSR Journal of Business and Management*. Available at: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=KufjkiwAAAAJ&citation_for_view=KufjkiwAAAAJ:2osOgNQ5qMEC
- Gaikwad, S. R. (2016). To Assess the Present Employability Skills and Impact of Skill Development Initiatives on 'GenNext'. *International Journal of Economics and Commerce*, Vol.1(3). Available at: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=KufjkiwAAAAJ&authuser=1&citation_for_view=KufjkiwAAAAJ:u-x6o8ySG0sC
- Hillier, J. (2015). Performances and performativities of resilience. In *Evolutionary Governance Theory: Theory and Applications*. https://doi.org/10.1007/978-3-319-12274-8_12
- Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. <https://doi.org/10.1186/s41039-017-0062-8>
- Mehrnaz Fahimirad. (2018). A Review on Application of Artificial Intelligence in Teaching and Learning in Educational Contexts. *International Journal of Learning and Development*. Vol. 8, No. 4 <https://doi.org/10.5296/ijld.v8i4.14057>
- Popenici, S. (2013). Higher Education and Affluenza. Popenici.
- Porayska-Pomsta, K. (2024). A manifesto for a Pro-Actively Responsible AI in education. *International Journal of Artificial Intelligence in Education*, 34(1), 73-83.
- Secundo, G., Vecchio, P. Del, & Passiante, G. (2015). Creating innovative entrepreneurial mindsets as a lever for knowledge-based regional development. *International Journal of Knowledge-Based Development*. <https://doi.org/10.1504/IJKBD.2015.074301>
- Williamson, B. (2024). The social life of AI in education. *International Journal of Artificial Intelligence in Education*, 34(1), 97-104.