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ARTIFICIAL INTELLIGENCE AND ITS PRACTICE IN CLASSROOM: A SYSTEMATIC REVIEW

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Abstract

Artificial Intelligence has been widely used in a variety of educational and social systems. It has the power to adjust established educational paradigms and give students access to more individualized, inclusive, and flexible learning opportunities. The goal of this computerized language is to impersonate a particular person's abilities and behaviors i.e. language comprehension, understanding, and thinking. The main purpose of this research is to review the use of artificial intelligence in the classroom based on previous research. These studies mentioned that the integrated network including intelligent tutoring systems, the internet, hypermedia, and distant learning play an important role in the education process. These interconnected networks have the power to update and enhance the input, process, and output levels of the educational process. Intelligent tutoring systems can improve learning by distributing course material, determining students' areas of strength and weakness in knowledge, providing automated feedback, choosing learning materials based on individual student needs, and even promoting student collaboration. According to reviewed studies learning activities based on AI feedback, permitting quick intervention, tracking student progress, enlivening the teaching process, and increasing student participation are the best techniques for classroom assessment. This study concludes that Artificial Intelligence (AI) may generate personalized assessment tasks based on individual student requirements and is sometimes utilized as an instrument in student engagement and academic honesty. Additionally, it's essential to provide personalized evaluation tasks based on each student's.

1. History of AI

In the 21st century, the definition, elements, and development of AI has many numerous changes of learning inputs, procedures, and outputs in the educational system has occurred. The roles that schools, teachers, and students play are evolving as a result of smart machine applications. Additionally, they will alter both the conventional and online interaction patterns in the classroom. To accomplish the necessary goals and share educational experiences, teachers and students will work using interactive machines. These devices will provide interactive learning environments that engage students in dialogue and react to their inquiries and responses. They will find solutions to common classroom issues including motivation and paying attention, handle learner differences, and assist students with specific needs. They will also address issues with feedback, raising student success levels, fostering good attitudes toward teaching and learning, and facilitating interaction in large class sizes. Using AI applications in the teaching and learning process will have a direct and positive impact on each of these areas. It was John McCarthy who first identified artificial intelligence in 1956. It led to a great deal of debate and controversy at the time over the question, "Can machines think?" as well as the distinctions between AI and human intellect. As artificial intelligence relies on replicating human intelligence, artificial intelligence (AI) is one of the modern computer sciences that aims to develop programming techniques to do certain tasks that mimic humans in daily life to some extent. This science is theoretically concerned with understanding human intelligence—its dimensions, patterns, and associations. It simulates some of the capabilities and operations of the human mind by examining its mental capacities in realistic scenarios. After that, it converts these thought processes into computer equations that can be used to resolve challenging issues. Expert system is a subfield of artificial intelligence that gathers and examines information about individual experiences to mimic and apply them in particular domains. Expert Systems are continuously developing these mental simulations based on the scenarios and issues that individuals encounter while interacting with AI equipment. In the right judgments, this enhances the educational process.

2. ARTIFIACIAL INTELLIGENCE

Artificial Intelligence is computerized languages that perform tasks that are typically related to intelligent existences. It is comparable to the European Commission's definition of artificial intelligence (AI), which defines it as systems that exhibit intelligent behavior by analyzing their surroundings and acting in a somewhat autonomous manner to complete a certain job (Boucher, 2020). It is making a machine that can skill human capabilities like learning, intellectual abilities, and critical thinking skills (Buabbas et al. 2023).

AI has been extensively applied in many spheres of Education and social systems. The potential of artificial intelligence (AI) to enhance education is demonstrated by reports from UNESCO (Miao et al., 2021 & OECD 2021). These reports highlight the automation of various aspects of teaching, such as administrative tasks, assessment, and evaluation; personalization of learning, such as intelligent tutoring systems; and availability of new tools, such as virtual reality and augmented reality. Computer systems that are capable of doing activities that call for aspects of a person's intellect, such as reasoning, designing, or creativity, are referred to as artificial intelligence (AI) systems. The field of AI is not new. However, over the past ten years, the technology has attracted a lot of attention and grown significantly as a result of improvements in computer language control, difficulty, information accessibility, and storage. Advances in speech recognition, graphics processing, and computer vision have also helped applications of AI (Mitchell & Brynjolfsson, 2017).

Artificial Intelligence comes in several forms. According to the Joint Research Centre of the European Commission (2018), there are three different ways to explain artificial intelligence (AI) that rely on knowledge, logic, and data. These systems could be referred to as "data ores" in biological terms, as the first strategy is primarily dependent on data and its availability. The other two methods focus on cognitive processes; logic-based AI solves problems using logic, and knowledge-based AI applies basic inference models, asserting that knowledge is more important than logic in making wise decisions. Further categories for AI include artificial superintelligence, general intelligence, and narrow intelligence (Marrone, Taddeo, & Hill, 2022). The most popular kind of AI is narrow AI, which uses machine learning to achieve specific objectives.

Artificial superintelligence is thought to be superior to humans, whereas general AI is thought to be on par with humans.

3. The Significance of Employing AI

One emerging trend in experimental research is the use of AI applications for teaching. According to studies, AI education applications are becoming more diverse and include high-tech open-source software and programmed learning. The degree to which AI applications can adapt to the needs and skills of students, function by their preferred learning style, and track each student's development is what determines the apps' significance in the field of education. These apps have music that can accommodate pupils with varying attention spans, increase motivation to learn, and fit all learners regardless of level discrepancies. They offer feedback that identifies the degree of student accomplishment as well as the scientific content's strong and weak parts. They guarantee the integration of the curriculum's subjects and sections. Because AI tutoring systems feature programs that automatically give instruction and let students use their study skills, they can take the role of teachers. AI transforms education from a manual process to one that is automated or conducted by intelligent, interactive devices. It uses natural language to generate fresh information and to support further learning activities. Applications of artificial intelligence (AI) can personalize tutoring and present a variety of educational models and streams that integrate languages with relevant subjects of study. As a result, they give students the option to study by flexible streams that accommodate their various skill levels and academic backgrounds.

4. Technical Functionality of AI

The term artificial intelligence (AI) has several different meanings in scientific discourse. "Computers which perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving. Baker & Smith (2019) described artificial intelligence (AI) in the context of education. The phrase refers to a variety of tools and techniques, such as computer vision, natural language processing (NLP), and machine learning (ML). Generally speaking, machine learning (ML) is the process of automatically identifying patterns and rules in data and then applying this knowledge to forecast fresh, comparable data (Domingos, 2012). Deep learning is one area of machine learning that includes sophisticated and potent algorithms like

artificial neural networks. Over the past ten years, deep learning algorithms have become more and more popular because they work well for difficult and data-intensive tasks like image recognition. Consequently, this renders them an indispensable constituent of other AI subdomains delineated by the task at hand, such as Computer Vision and Natural Language Processing.

According to Baker & Smith (2019) innovative techniques continue to develop and proliferate, they are being utilized more and more to assist educators, administrators, and students in the field of education. Richter et al., (2019) identified four primary areas of AI application in the educational setting: assessment and evaluation (i.e., assessing student engagement), intelligent tutoring systems (i.e., delivering automated feedback), adaptive systems and personalization (i.e., delivering personalized content), and profiling and prediction (i.e., predicting academic achievement of students). These four application areas, however, do not necessarily have to be thought of as distinct (research) domains; they may potentially overlap, like in the case of using AI to run classrooms. Numerous sub-communities conduct research on a range of those topics, including learning analytics and NLP applications in education. Our review's objective is to provide a thorough overview of these sub-communities with an emphasis on classroom management.

There are a lot of AI technologies available that might help teachers manage their classrooms, give students the best learning environments possible, and support research by producing and analyzing increasingly complicated data. However, human perception and utilization are just as important to success as technology and its faultless, impartial operation. Thus, it is important to talk about data security and privacy protection in addition to other ethical issues.

5. Practice of AI in Education

Using knowledge representation technology, artificial intelligence aims to replicate certain human functions and behaviors like learning, reasoning, and comprehending natural language. There are many different uses for AI, but one of the most significant uses is in online electronic learning smart systems. These are the main ways that artificial intelligence is being used in

education. They are the result of combining numerous artificial intelligence systems and applications, including:

- Intelligent Coaching Systems
- Initiating the Internet
- Initiating hypermedia
- Initiating distance online education

These programs operate together to create an integrated network that can update and improve the educational process at the input, process, and output levels. Interaction between students and freely available resources and tools is a defining feature of AI applications. Additionally, they enable the utilization of virtual labs and combine the real world and virtual reality in a captivating learning environment. The following criteria are used to determine AI education applications.

- Programs for natural language processing are linked to other programs and systems that can understand and produce language. Natural language used by the student and the machine to communicate is understood by both.
- Machine programming: The learner uses the computer to create software that interprets or converts incoming data automatically.
- Robots or computerized man: These devices can be utilized in schools to complete extracurricular learning activities.
- The capacity of the computer to see through photo sensors. The computer can identify shapes and persons by analyzing images and drawings.
- Computer games: These consist of learner-versus-computer competitive games.
- Expert systems: These let students create specialized databases that they can utilize to solve issues and examine real-world scenarios.
- Computer-based learning: Computers are used to store and retrieve educational materials, administer teaching and learning processes, and provide instructions to students. This is all done in an intelligent self-study setting.

Virtual reality (VR) simulations, augmented reality (AR), and digital game-based learning can all be used in education (Holmes & Tuomi, 2022). Artificial intelligence has the potential to provide each student with a personalized learning companion that would serve as both a guide and a teacher in addition to tracking the student's interests and progress over time (Holmes, Bialik, & Fadel, 2023).

Student evaluation is another area of education where artificial intelligence has an impact. The advancement of AI technology has made it possible to automate assessment procedures in part or completely. It can now be used to create tasks, find suitable matches for grading, and mechanically score pupil work (Swiecki et al., 2022). These programs known as auto graders are typically used to evaluate written assignments. They can also be used in computer science and mathematics to score student responses identify the sort of error and provide a fix (Holmes & Tuomi, 2022).

6. Use of AI in classes

Even though generative AI is only now becoming widely employed in education, there are many other ways that AI is being applied in education. Studies on the application of AI in education have concentrated on the following areas: student feedback; reasoning help; adaptive learning; collaborative play; and gamification (Zhai et al., 2021). According to a current analysis of artificial intelligence in Education, there are four primary functions that AI can play in the classroom:

Tasks can be assigned according to individual competency; human-machine dialogues can be established; student work can be analyzed for feedback; and digital environments can become more adaptive and interactive (Chiu et al., 2023b). A particularly popular use of AI is intelligent tutoring systems, which enhance learning by delivering course content, identifying knowledge gaps or strengths in students, offering automated feedback, selecting learning resources according to each student's needs, and even encouraging cooperation amongst students (Richter et al., 2019).

Using AI in the classroom has several advantages, such as choosing the best learning activity based on AI feedback, enabling prompt intervention, monitoring student progress,

adding interest to the teaching process, and boosting student interaction (Celik et al., 2023). Educators have put out a range of potential AI-integrated lesson plans, with a focus on interdisciplinary instruction, real-world problem-solving and creative exercises (Kim et al., 2023). More powerful AI systems have recently given rise to innovative learning designs. For example, in junior secondary school classes, AI is being used to inspire learners to investigate various graceful structures (Kangasharju et al., 2022) in discovery learning, AI-encouraged direction is being used to maximize knowledge results by maintaining pupils in the area of proximal development. Such applications hold out a great deal of hope for generative AI's developing power. There are worries, meanwhile, that AI would just modify content access rather than significantly alter fundamental teaching methods (Zhai et al., 2021). Artificial intelligence practice is supportive and empowers learners as leaders and is crucial to effective teaching (Ouyang & Jiao, 2022; Xu & Ouyang, 2023).

7. Artificial Intelligence Practice in a Curriculum

A growing number of schools and universities are incorporating AI education into their curricula (Dai et al., 2020; Xu & Ouyang, 2023). According to Holmes et al., (2019) learning computer functions, including model building with the former is a necessity for computer knowledge and learner interaction with computer machines.

Markauskaite et al., (2022) emphasize the importance of having strong problem-solving skills evaluative abilities, creativeness, self-regulation, compassion, and values with the use of artificial intelligence in curriculum. Similarly, Carvalho et al. (2022) contend that to enhance a person's ability to communicate and engage with AI technologies in life, learning, and the workplace, educational approaches that stress individual competencies, Innovative complex critical thinking skills, and teamwork are necessary. According to Holmes et al. (2019), deeper learning objectives are necessary, and they should emphasize transfer, interdisciplinary, versatility, and integration of competencies, individual development, and adaptive learning into the instruction of conventional learning domains. More generally, it's not apparent what matters to teachers when it comes to incorporating artificial intelligence into the curriculum.

8. Artificial Intelligence and Assessment

Through the formation of evaluation processes, analytical writing abilities, computerized practice of the learning process, and the creation of more adaptable and tailored assessments, artificial intelligence (AI) may help teachers with assessment procedures (Swiecki et al., 2022). Computerized grading of papers and classroom student assessments, by text explanation, image recognition, and other techniques, is another significant application of AI in education. AI can create customized assessment assignments depending on each student's unique needs and is occasionally used to measure academic integrity and student participation (Richter et al., 2019). Additionally, AI expands the possibility for concentrating on knowledge-based evaluation and collaborative performance assessment (Kim et al., 2022). When utilizing AI in assessment, several issues must be resolved, such as disregarding specialized knowledge, postponing responsibility, implementing surveillance pedagogy, and possibly unfavorably separating individuals and machines during the evaluation procedure (Swiecki et al., 2022). Concerns with identity, plagiarism, and learning assurance arise when generative AI techniques become more widely available (Hisan & Amri, 2023).

The integrity and goal of education may be compromised if pupils can perform assessment performance by turning in functioning with the help of a computerized machine (Cotton et al., 2023). While Artificial intelligence detection instruments (such as AI Text Classifier, GPTZero, AI Cheat Check, and AI Content Detector) have proliferated almost as quickly as generative AI itself, educators are not able to judge the learner's original writing abilities with the help of multiple computerized instruments (Cotton et al., 2023).

9. Artificial Intelligence and Teaching Practice

AI can help teachers with their work by offering adaptive teaching tactics, supporting teacher professional growth, and providing evidence-based support for educational decision-making (Chiu et al., 2023b). One increasingly important factor influencing learning is the teacher's role and how they handle the use of AI in the classroom. According to one study looking at Year 10 students' use of AI chatbots, teacher support had a big impact on students' inspiration and ability to acquire using the AI phases (Chiu et al., 2023a). On the other hand, other studies have discovered that not every student gains equally from the practice of artificial

intelligence in the classroom and that the usage of AI passively or mechanically may even have the opposite effect. As a result, when assisting students in learning with AI, it is important to comprehend the function that teachers play in terms of the learning strategy that they employ.

There are difficulties in using AI for teaching, such as its limited capacity, applicability, and dependability (Celik, 2023). The significance of Fairness, Accountability, Transparency, and Ethics (FATE) in artificial intelligence (AI) has been emphasized by scholars. They advocate for the implementation of eXplainable AI (XAI), which allows AI judgments to be transparent and readily available. (Khosravi et al., 2024). Many complex ethical problems need to be raised, such as the continuation of institutional bias and discernment already in place, privacy concerns, inappropriate document use, and the exacerbation of inequality for pupils from underprivileged and relegated groups (Akgun & Greenhow, 2022; Miller et al., 2018). For some subpopulations, such as low-socioeconomic, female, and Indigenous pupils, disparities in approach to artificial intelligence procedure may widen the disparity gap (Celik, 2023). When it comes to resolving these problems, teachers might be quite important.

Although most instructors believe that artificial intelligence (AI) can offer a variety of educational opportunities, many are not well-versed in AI or the best ways to incorporate it into their lessons (Chounta et al., 2022). It seems that some educators are not very motivated or interested in incorporating AI into their lessons (Celik, 2023; Chiu et al., 2023b). But for instructors to successfully integrate AI into their lectures, if they so want, they must possess the necessary AI Readiness, which entails having an understanding of how AI functions and what it can do, at least in non-technical terms (Luckin et al., 2022).

According to recent studies, there is frequently a disconnect between the usage of AI technologies in the classroom and their application (Chiu et al., 2023b). As a result, further research is required to determine the best ways to apply AI in education in the classroom regarding artificial intelligence, education, and ethics (Richter et al., 2019). Undoubtedly, AI is not the only emerging technology to raise moral dilemmas. However, ethical issues in AI research and development pose particular difficulties since they call for humans to think about whether, when, and how robots should decide how to live human lives, as well as whose values should govern those choices (Campolo et al. 2020).

The ethical implications of coexisting alongside intelligent and autonomous machines and systems have garnered significant attention from academics over the past few decades. Numerous terms are used to refer to this topic, such as robotics, safe/friendly AI, machine ethics, computational ethics, and artificial morality. Understanding the advantages and disadvantages of living with partially or completely autonomous computing systems from an economic and social perspective is directly related to this multidisciplinary ethical topic. These systems include disembodied AI, which is spread through common computing applications and may have an unintended or intentional effect on person management system and activity (the capacity of individuals to perform activity freely), as well as personified AI language application to perform individual facility (Torresen, 2018).

10. Classroom Management as a Key Characteristic of Effective Teaching

Effective classroom management is essential to students' academic performance. According to research on teaching effectiveness, instructors who are successful in planning effective lessons can effectively assist students' learning (for information on teachers' classroom management strategies, such as offering structure (Patall et al., 2023). Monitoring student behavior, making sure that objectives and rules are clear and transparent, offering a structure that directs students' behavior, and skillfully handling disruptions—that is, extending the amount of time that students are engaged in active learning—are some of the characteristics that define effective teaching (Praetorius et al., 2022). Teachers can be relieved by AI-based classroom management tools (e.g., reduction of cognitive burden). Furthermore, there is legitimate hope in educational psychology and research that more trustworthy and legitimate AI systems will eventually take the role of occasionally unreliable external observers. The explanation of key teaching practices, many of which are related to classroom organization, such as putting in place organizational routines, makes clear how important teachers are to classroom management (Grossman, 2018).

By saving them time and effort, the application of AI can help teachers with the evaluation process (Holmes & Tuomi, 2022). Computerized adaptive testing systems (CATs) allow tasks to be adjusted by providing electronic techniques for learners' computerized evaluation that can provide ongoing pursuit of pupils' performance within the classroom

(Swiecki et al., 2022). Notwithstanding the aforementioned advantages, it is important to remember that using AI for automatic scoring assessments, particularly for high-stakes exams, constitutes, it is a dangerous way of assessing the students' scores performed by automatic scoring evaluation (Holmes &Tuomi, 2022).

11. Artificial Intelligence and Evaluation Practices

The significance of artificial intelligence (AI) applications in the analysis and generation of secondary and pre-secondary student evaluation process results. Teachers no longer have to struggle to accurately gauge their students' proficiency—thanks to artificial intelligence. It makes it possible for academic staff members at universities to evaluate the quality of the instructional materials and identify gaps in the lectures, scientific content, and student education. AI is a program to recognize pupils' errors regarding classroom assessment methods that would be helpful to introduce immediate feedback for each learner by the instructor. This helps meet each student's needs based on his or her capabilities and needs by assigning home assignments and tracking the scores attained by each pupil.

Furthermore, the density of classrooms can be handled by AI tools and systems. It is clear from the foregoing data that AI concentrates on two problems. The first, or theoretical challenge, has to do with expressing human behavior in tasks and circumstances that are true to life as well as characterizing and understanding mental activity and processes. The second, or applied, issue, on the other hand, is about using intelligent devices and tools to simulate human behavior. Artificial Intelligence encompasses a range of applications that are commonly utilized for pedagogical purposes, including knowledge representation and storage, as well as the introduction of diverse models for learners and electronic-machine interaction. Current vocabularies provide particular information regarding contexts that can be used by AI programs to translate between English and Arabic effectively, improving the learning process. These applications can employ sounds to distinguish between letters and words, explain some concepts related to the reading material, and organize words to form sentences. They can recognize word mappings and make connections between sounds, images, and text.

Conclusion

Artificial Intelligence has been widely used in a variety of educational and social systems. It has the power to adjust established educational paradigms and give students access to more individualized, inclusive, and flexible learning opportunities. Integrated networks including intelligent tutoring systems, the internet, hypermedia, and distant learning play important roles in the education process. These interconnected networks have the power to update and enhance the input, process, and output levels of the educational process. Through the use of information and communication technology, computer-aided education, or CAI, enables students to access the system from their homes or laptops for learning and instruction that is not reliant on time. By enabling novices to learn more in the same amount of time as students receiving traditional instruction, CAI raises learning standards (Rubab, 2021). Personalized learning and pedagogical agents that provide learners with feedback and relevant, well-organized content are two ways that AI may aid educators and students. Though there is still much to be done to certify that the computerized machine is effective and not for harm, artificial intelligence (AI) for education is moderately early phases of planning additionally, there needs to be transparency in the processes to clarify the liability in the classroom, school management system. To save the future and modify the behavior of the student educators, administrators, and legislators should start actively participating in the advancements in AI for education and society.

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