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Artificial Intelligence in the Field of Education, A Meta-Synthesis

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Abstract: Rapid progress and expanding practical applications characterize the field of artificial intelligence (AI). AI has already affected the way people learn. However, its implementation in education raises both practical and ethical concerns. The study aimed to investigate recent AI-related educational technology breakthroughs and challenges. Trends in educational literature promoting AI are also examined in this study to grasp these developments better. In addition to highlighting current needs, this article offers suggestions for the Future. Questions guiding this investigation concern how AI is employed in the classroom. Implications for the Future of educational technology in the Field of artificial intelligence. A meta-synthesis approach was utilized to assess the available and relevant literature to determine the current study's emphasis, provide a comprehensive overview of AI breakthroughs in education, and provide suggestions for future research. The results show that in developed nations, artificial intelligence (AI) in the classroom has progressed and that throughout the digital era, most research and implemented AI trends have grown in popularity.

Keywords: Artificial Intelligence; Education Technology; AI in Education.

1. Introduction

Technology has played an integral role in the classroom since the advent of the first computers and all the upgrades that followed (Schindler et al., 2017). According to Jones (1985), educators were noticed using PCs for instructing, directing examinations, recording undergraduates' grades, and different assignments. Undergraduates likewise utilized PCs to get the hang of exploring and critical thinking, in addition to other things. PCs have likewise been utilized as a showing device and a technique for saving undergraduates' information data sets. Artificial intelligence, or "a machine with intelligence that operates in an approach that would be regarded as intelligent if it were a human," refers to the study and development of intelligent computers. (2007), Kennedy.

According to John (1956), at the Dartmouth Artificial Intelligence Conference first time artificial intelligence (AI) was integrated. Experts in various disciplines got together to discuss the origins of the concept of "thinking machines," which includes topics like how information is derived from sensory inputs, how creativity and chance are related, and more.

Most respondents agreed that it is theoretically conceivable for computers to mimic human intelligence but expressed more anxiety about how and when this might happen. The development and spread of AI are proceeding at lightning speed right now (Tegmark, 2015). Its impact on our lives has become even more profound. With increasing familiarity, businesses increasingly incorporate AI and ML into their offerings ((Zawacki-Richter et al., 2019). FaceApp uses AI to recognize the same people in different Facebook

photos that have been incorrectly labeled. At the same time, Google Duplex is a chatbot that can carry out certain linguistic activities like making an appointment or a reservation over the phone. Among the many artificial intelligence applications are self-driving vacuum cleaners and other forms of intelligent gear. It has already been demonstrated that the benefits of AI in the classroom are immense. Robots like Yuki and Sophia (a humanoid) are two artificial intelligence applications in classrooms today (Retto, 2017).

Berker (2008) classified (AI) as either "frail" (which focuses on a narrow set of problems) or "general" (which can perform a wide range of tasks that generally need human intelligence).

Many experts, including Stephen Hawking, have expressed concern that the misuse of advanced AI could result in worldwide chaos and possibly the extinction of humanity. Artificial intelligence researchers have even proposed replacing human educators with AI demos in the classroom. Due to the limitations of current computing technology, "Soft AI" is used throughout this work in place of the more common "Hard AI." Computer-based intelligence in training has been the topic of many studies, but the potential and benefits of AI in education have yet to get much consideration. There needs to be more research that weighs the benefits, drawbacks, and dangers of AI implementation in the classroom.

The study aims to examine current problems and future directions with the application of AI in academic settings. Trends in educational literature promoting AI are also examined in this study to grasp these developments better. This article also features a discussion of future requirements and some suggestions. Research questions that follow include: How are AI-based educational trends shaping up? In order to further Counterfeit intelligence in the realm of education, what future requirements must be met?

2. Research Method

The research looked specifically at how AI is currently used in classrooms. Qualitative literary synthesis (Meta-synthesis) is the method used in this study. It is a systematic approach to reviewing and assessing the literature. Articles published in 2021 and 2022 formed the basis for this study's inclusion criteria. Due to the significant number of articles published in reputable journals, only 16 were chosen for a comprehensive qualitative review. Focusing on AI's role in the classroom, this research aimed to establish new norms for school diversity. Articles primarily focused on characteristics other than climate, geography, and behavior were disqualified from inclusion in this analysis—articles presented at conferences or in proceedings not initially published in English.

2.1. Qualitative synthesis

They are conducting a qualitative analysis and synthesis of the literature under consideration. According to Chu et al. (2022), design (including PC courses) is where computer-based intelligence finds the most success, quantitative research methods are the most widely used, examination regions typically have between 30 and 150 questions, and the vast majority of student log records come from online learning platforms.

In theory, there is no limit to how AI could improve classroom instruction. Chatbots, expert systems, machine learning, intelligent teachers or employees, perception, and individualized learning experiences were some of the topics explored in the articles (Zhang & Aslan, 2021). AI is significantly impacting educational facilitation even in developing nations and with innovative educational models and trends, including online courses, hybrid education, flipped learning, and others.

As AI gets smarter and more capable, it opens up exciting new ways for learning settings. If we want to use AI in the classroom in a useful way, we need to bridge the gap between how AI technology is changing and how it can be used in the classroom. Lists some of the most common types of AIEd, gives examples of how they have been used in the classroom and makes statements about how they will be used in the Future (Bearman et al., 2022; Holmes & Tuami, 2022). Using AI, teachers, and students could have more productive conversations, students who are more interested in learning, more individualized learning materials, more metacognitive cues, and classrooms that are more fun and interesting. AIEd can provide prediction models and help find exceptional or vulnerable children, track learning progress, create individually tailored instructional materials, assessments, and feedback, and analyze aggregated data in real time for administrative or evaluation purposes. (Zhang & Aslan, 2021; Chaudhary & Kazim, 2022) Expert systems in AI-enhanced learning environments may simplify LMS usage for educators and students, give visual feedback, and improve teaching through visualization and immersive technologies.

When AI is used in the classroom, it can replace a one-size-fits-all method with instruction tailored to each student's needs. We can figure out that AI and the gadgets that go with it can help teachers and students reach their full potential by making educational progress. As Abdelsalam wrote in 2014, he suggested an intelligent teaching system (ITS) that used a new teaching method. The next thing we talked about was consequences and risks. Participants in the study said that widespread use of AI would lead to more computer-based training and computer-assisted guidance systems, fewer chances for teachers, and more moral and safety worries. A recent study (Choliz, 2010) shows that using a cell phone too much, in the wrong way, or for the wrong reasons can lead to mental, social, and emotional health problems. Respondents said that smartphones had yet to remove their social ties, but they are worried about how artificial intelligence (AI) will continue to grow in the mobile world and how it will sneak into people's lives and phones. This is what Gocen and Aydemir said in 2021. Institutions are where most of the crucial parts of educational technology are. Schools use digital infrastructures like the Internet to connect learner classes, educational institutions, and regions to share high-quality teaching materials. Using computer technology, a virtual classroom and instruction database built on a class teaching system were built to get around space and time limitations. Build a database so important information can be saved and used to make choices about running the classroom. 2023: Computing on mobile devices; 2021: Tahiru.

Online learning is the basis of innovative education. It is made with the student in mind and uses cloud computing, big data, artificial intelligence, and other information technologies to record the student's ongoing chain of behavioral data. A "smart" education is made to fit the needs of each student. It can inspire students to reach their full potential and help them grow as whole people (Limna, 2022). The education system in our country has changed from traditional schools to online learning, and it is now moving toward targeted, data-driven teaching methods (Ziede, 2019; Richter et al., 2019). The government and the market use information technology, the Internet, artificial intelligence, and other technologies to support education reform in today's AI-driven world. Online education, "Internet + education," the "cloud," "cloud intelligent" education, and the "intelligent tutor system," according to Holmes et al. (2021), are all ways in which education is progressing. China is almost done laying the groundwork for college informatization, and the country is moving toward a deep integration of technology into the education process. Internet-based AI has been a critical part of the development of online education, and both teachers and students have found it to be a helpful tool (Huang et al., 2021; Zhai et al., 2021; Xieling et al., 2022).

It has been shown that artificial intelligence (AI) helps students by making some teaching chores more efficient. For example, students all over the world can use material better when it is translated between languages at the same time. It also makes the text easier to understand for people learning English as a second language. Artificial intelligence (AI) could make routine office tasks faster, easier, and more personalized. This would give teachers more time to teach skills that AI-powered tools cannot match, like understanding and flexibility. We used AI methods on data from academic institutions, and the results support the idea that AI is usually optimistic. (İçen, 2022).

3. Conclusions

Future educational endeavors will use AI more as the underlying technology improves. Understanding the state of affairs regarding AI and education can be attained by examining the uses of AI in education and the challenges that AI technology in education faces. Improve the quality of teaching, help students develop more effective learning strategies, and expose them to a broader range of learning approaches through artificial intelligence technology and trends in the classroom.

4. Recommendation

Future assessments may broaden the search to include scholarly publications, peer-reviewed conference proceedings, and other reputable databases. Different search terms, such as artificial intelligence (AI) methods, machine learning, Chatbots, or their academic programmers, will yield better results. However, future evaluations should consider the search results, which may contain articles on unrelated topics such as game-based learning. Data mining in education, educational analytics, and computer-based education are just a few of the emerging subfields AIEd crosses. In the Future, qualitative research methods like interviews or quantitative analytic methods like online questionnaires may be developed to provide

further clarifications and explicit results. Teachers, students, and school officials can all benefit from analyzing the results and then implementing the most effective strategies for employing AI in the classroom.

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