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Challenges and Benefits of 7 ways Artificial Intelligence in Education Sector

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ABSTRACT

Objective: This article aims to investigate the integration of artificial intelligence (AI) into the education sector and explore its impact on teaching and learning in the digital era. By synthesizing existing literature, the study seeks to provide insights into the benefits and challenges associated with AI's incorporation in education.

Method: A comprehensive review of the literature was conducted using a narrative synthesis approach. Peer-reviewed articles explicitly defining AI within an educational context, published in English and subjected to peer review, were included. Five independent reviewers evaluated research quality, extracted relevant data, and analyzed search results to ensure a comprehensive overview of the field.

Results: The study reveals the significant influence of AI on education. Its implementation is identified as a pivotal and strategic element of educational advancement. The growing role of AI as a digital assistant is particularly noteworthy, facilitating personalized learning experiences for students by tailoring educational resources to individual preferences and subject-specific needs. AI technologies are also instrumental in supporting both teachers and students across various aspects of education.

Conclusions: The integration of AI in education marks a transformative phase for the industry. While AI offers substantial benefits in terms of enhanced learning experiences and increased teacher efficiency, potential drawbacks and concerns are also evident. Privacy, security, and safety issues arising from AI development underscore the need for thoughtful implementation. Thus, AI's impact on education is multifaceted, presenting both positive and negative

implications. This study serves as a foundation for stakeholders in education to navigate the evolving landscape, making informed decisions that harness the potential of AI while mitigating its risks. By comprehensively assessing AI's current and future role in education, this research contributes to shaping a balanced and effective utilization of AI technologies in the pursuit of educational excellence.

Keywords: Artificial Intelligence (AI), Education, Digitalisation, Technology, Review.

Introduction

The use of information technology (IT) as a facilitator for other activities and services in this contemporary period of the industrial revolution 4.0 permeates nearly all aspects of human life. IT is becoming a necessary component that must be owned rather than just a tool. Its development has led to a great reliance on information technology, which significantly facilitates human life activities (Rahmatullah et al., 2022). The current generation is also technologically literate since it has a far bigger impact in the digital age than it did in earlier ones.

Technology in education has expanded as a result of the rise in literacy and current technical breakthr oughs. These are the generations that are currently enrolling in schools, from millennials to GenZ, and they all have distinctive traits that indicate their ages. These generations do not fare well as passive learners and demand to be actively involved in their education.

As a result, technology needs to be welcomed in today's school, and educators must help kidslearn thr ough technology (Hashim, 2018).

Given that performing education in the context of public services requires good governance that ensur es transparency, accountability, efficiency, and effectiveness of education, using IT in the implementa tion of education by a modern educational institution at the level of a world-class university has become a requirement. The seriousness of management underpins the application of information and communication technology (ICT), which is one of the main pillars of the develop ment of human civilisation today, in the implementation of all educational activities. This is because management is aware of the significance of ICT (Rahmatullah et al., 2022). Due to its ability to suppo rt learning in a variety of situations, big data and artificial intelligence technologies have rapidly adva nced and had a significant impact on all facets of society in recent years. The field of AI in education has exhibited technological advancements in human civilization, including the economics, politics, sc ience, and education, with a variety of applications such as intelligent tutors for content delivery, feed back providing, and progress supervision (Luan et al., 2020). Artificial intelligence (AI), a machine based approach with algorithmic ability for making predictions, diagnoses, suggestions, and judgment s, has emerged as a major force in educational advancements, theoretical innovations, and practical p edagogical influence (Chen et al., 2022). Consequently, a crucial issue is the adoption of artificial intelligence (AI) in the education sector.

Literature Review

Artificial Intelligence (AI)

The field of artificial intelligence (AI) technology has a long history is dynamic and growing

It emphasises intelligent agents, or machines that can comprehend their environment and make decisions, taking measures to increase their prospects of success (Shabbir & Anwer, 2018). the word "artific ialintelligence" evokes us ideas of supercomputers, which are computers with enormous processing power, adaptive behaviour,

including adding sensors and other components that enable them to have cognitive and functional abilities similar to humans, which enhances the supercomputer's connection wi th people (Chen et al., 2020).

Artificial intelligence is the capacity for learning and thought in computer programmes.

Artificial intelligence refers to everything that includes a computer programme performing a task that most people would consider to require human intelligence (Mitchell, 2019).

The simulation of human intelligence functions by computers, more precisely computer systems, is known as artificial intelligence. Because it enables computers to make wise decisions that result in more effective operations, artificial intelligence (AI) transforms nearly every aspect of a nation's economy and excels at certain activities (Dong et al., 2020; Limna, 2022).

The use of AI is widespread in practical fields. In addition, as computers and robots become more sop histicated, society is being transformed by them. Nearly every facet of people's daily lives now includes AI (Li et al., 2018). AI also makes it possible for employees to perform more efficiently, which im proves corporate results. However, it also calls for the development of fresh skills and abilities, from technological mastery to social and emotional intelligence to creative aptitude (Limna, 2022).

AI offers huge advantages and has the ability to revolutionise any professional field (Makridakis, 2017). As a result, industry 4.0 considers artificial intelligence deployment to be crucial. It has presented countless chances and difficulties to numerous sectors since its inception. AI-powered innovations have the potential to greatly boost the economy by raising standards of living across a variety of industries (Limna et al., 2021).

Artificial Intelligence in Education

The use of AI in education has advanced significantly during the past 25 years (Roll & Wylie, 2016). Since the growth of computing and information processing tools, AI has been extensively applied in education. AI in education opens up new possibilities, difficulties, and opportunities for educational methods (Ouyang & Jiao, 2021). The goal of AI in education is to significantly improve educational methods through field tests and the creation of modular standard prototypes for statistical reasoning, data visualisation, and learning analytics (Alam, 2021).

Giving each student individualised learning assistance or support based on their learning status, preferences, or other personal attributes is one of the most significant goals of AI in education (Hwang, 201 4; Hwang et al., 2020).AI in education also aims to use AI to support the instructional process, which is crucial and where instructors' acceptance of AI is crucial (for example, comprehending and support ing computer supported collaborative learning through discourse analysis and achieving performance prediction through educational data mining).But because AI is still a relatively new idea to instructor, they frequently have trouble responding quickly and effectively to insights from AI enabled applications. As a result, they are less willing to adopt AI and are less open to it. Therefore, it is essential to increase teachers' adoption of AI systems (Chen et al., 2022).

To handle the new opportunities and problems posedby the big data boom and AI revolution, academi cs, educators, policymakers, and professionals must collaborate. They must work together to help all students acquire the competences and abilities needed for work in the knowledge based economy of the twenty

first century (Luan et al., 2020).The implementation of AI in education has opened up new possibiliti es for creating learning activities and surroundings that are better utilising technology.AI technology i n education has many crucial components, including

autonomousgrading systems, adaptive learning, distance learning, and more (Hwang et al., 2020; Yufeia et al., 2020). The way that students rate their teachers is through instructor feedback. It is a feedback technique that has been utilised for a long tim e in education.Despite the switch from paper to internet surveys, the feedback process hasn't advance d much.It must be given priority because student feedback on instruction is typically the most useful s ource of data. Modern tools like conversational AI robots, machine learning, and natural language pro cessing present promising potential to raise the calibre of feedback (Holstein et al., 2019; Peters, 2019). An expert AIbased computer software called the automatic grading system grades student work in a classroom by simulating the actions of teachers. It assesses students' knowledge, examines their respo nses, offers comments, and develops customised training plans. Many apps for artificial intelligence basedteaching use this programme. During the learning test, the system automatically offers the learn er evaluation score. While students are more aware of their learning accomplishments and level of information mastery, this approach can help teachers better comprehend the learning conditions that their students are in (Yufeia et al., 2020). AI is essential to distance learning as well. The use of artificial intelligence in distant learning aims to investigate how computers might help close the communication gap between students and teachers. Distance learning can be supported by artificial intelligence technology or can be enhanced by other intelligent systems (Kose, 2014).

Benefits and Challenges of Artificial Intelligence in Education

The benefits of AI applications in education are numerous and diverse (Owoc et al., 2019). Several AI applications driven by machine learning are being used in more educational context. Personalized learning systems and other machine learning techniques automate evaluations, social media platforms, and predictive analytics software. These AI programmes have demonstrated promise in aiding educators and students in a number of ways, including viainstruction in classrooms with a variety of a bilities, giving students thorough and

immediate feedback writing, relieving teachers of the stress of having to know everything, and providinggiving them great er space to support their pupils as they observe, converse, and gatherutilising information in their gro up knowledgebuilding procedures, etc. (Akgun & Miao et al., 2021; Greenhow, 2021). Social networking sites use platforms like Facebook to link up students and teachers. The use of social media in the classroom can encourage students to actively learn, collaborate, and interact with networks outside of the classroom. Due to various AI systems, chat bots can now be found on social media platforms (Kim et al., 2019; Krutka et al., 2019). Individualized learning environments, sometimes referred to as adaptive learning environments or intelligent tutoring environments, are typical and beneficial uses of AI to assist students and teachers. These programmes allow students access to diverse educational resources based on their individual topic areas and learning requirements (Akgun & Greenhow, 2021).

One of the most exciting uses of AI in education is adaptive learning. Traditional classroom instructio n is still a one-size-fits-all approach, while AI powered adaptive learning solutions are made to maximise learning effectiveness (Owoc et al., 2019).

Despite these benefits, there are still valid worries. One major issue is privacy.

Critical problems on the table are the violation of privacy and the uncertainty brought by AI. negative effects of ridesharing technology adoption (Cheng et al., 2022). Data organisation, collection, control, storage, use, archival, and destruction are all aspects of data governance. A specialised programme, defined policies and processes, as well as communication from organisational leadership and manage ment, all work together to establish data governance.In general, the regulations must give the tools re quired to uphold the general standards, which include auditability, security, accessibility, availability, completeness, accuracy, integrity, and consistency (Owoc et al., 2019). The application of the charac teristics associated with

each technology is crucial for the efficient use of big data analytics and AI. T he person has the knowledge and analytical abilities necessary to use comprehensive data analysis to aid in analysis and decision-making (Tong-n et al., 2022).

7 Ways Artificial Intelligence Is Used in Education

1. Task Automation

Similar to how AI has been used in other industries to automate tasks, it will be useful in the education sector. Professors and teachers usually have to manage the classroom environment alongside numer ous organisational and administrative tasks. According to a report in research paper writing services, t eachers don't just teach. They also spend time grading tests, evaluating homework, filing the necessar y paperwork, making a progress report, organising resources and materials for lectures, managing tea ching materials, etc. There is a lot of work required.

In the end, they spend a lot of time on non-teaching chores, and it overwhelms them. In order to free up more time for teachers to focus on their core duties of teaching, artificial intelligence will automate these tasks.

2. Personalized Learning

AI can ensure that educational software is personalised for individuals. There are already adaptive lea rning software, games, and programmes for students. This use of AI is perhaps one of its most signifi cant in education as learning is more comfortable and smoother and cut through personal knowledge. This system emphasises each student's needs, highlighting specific topics students are weak in and re peating subjects they haven't mastered. This will create custom-tailored education through AI. Teachers will only be there to offer assistance and help when pupils need it.

3. Universal Access

Educational classrooms can become globally available to all students through AI tools, even those that have hearing or visual impairment or speak different languages. With a PowerPoint plugin such as Presentation Translator, students have real-time subtitles for everything the teacher says. This opens up new opportunities for children who need to learn at different levels, who want to learn a subject unavailable in their school, or are unwell and missing from schools. The barriers between conventional grade levels and schools can be broken down by AI.

4. Smart Content Creation

AI can help teachers create smart content that makes teaching and learning more comfortable for them and the students, respectively. According to Paul Barry, lab report writer at assignment writing service, AI can help teachers create different content types.

- Digital lessons
- AI can help generate bite-sized learning, study guides, digital textbooks, all within the framework of digital learning.
- Information visualization
- Simulation, visualization, and web-based study environments are different ways to perceive information that AI can power.
- Learning content updates

Learning content can be generated and updated regularly with AI. This ensures that information is up-to-date.

5. Teaching the Teacher

One thing that is important in education is for the teacher to not rely on their old, residual knowledge. There are more facts that they need to know and teach the students as well. Not to mention the fact that they study and teach within a limited scope and there are many other things that they can still learn. With AI, teachers have extensive information available to them at their fingertips This allows them to

keep themselves educated in things that they didn't know or improve on their past knowledge. With this, they will be better rounded and have a more in-depth and broader knowledge base to sea with the 21st century students.

6. Identify classroom weakness

The main concern of implementing AI in an industry is that it will replace the industry's workforce, causing job losses. But that's not totally accurate. In truth, AI is not intended to replace instructors in the classroom. It's intended to go along with them. AI can supplement the teacher's efforts in a classroom to discover some of the shortcomings within the classroom. For example, AI will be able to identify when some students miss specific questions. By warning the teachers, they are made aware that the material needs to be taught again because the students still don't understand it. This will make the teachers more accountable and make them another to the best teaching practises.

7. 24/7 Assistance

It's not just teachers that have access to a whirlwind of knowledge through AI. Students do too. This implies that they can use AI bots at any time of day to get assistance on any subject.

Traditionally, students only get solutions to their problems when they meet with their teachers or professors and have the chance to ask them questions in the classroom. Thankfully, they will not have to wait that long anymore.

Several AI-powered chat bots are specifically built for education as a sector. They work as students' assistants round the clock to provide answers to their queries at any time. So, they don't have to wait to see the prof in their office or the classroom.

Conclusion

Personalization is at the top of the list, as anyone who is knowledgeable about international trends in various industries will

know. This is due to the advent of artificial intelligence, which is an advantage for the education sector. AI helps teachers up their game, providing them all the information that they need. It also allows teachers to create content that suits their students best while ensuring personalised learning. It automates tasks, so teachers have more time to do more teaching and impact the students better.

The development of AI technology has a long history and is ongoing. Ouyang and Jiao (2021) indicated that since the advancement of computing and information processing techniques, AI has been used extensively in education as it creates new opportunities,and challenges in educational practises. Owoc et al. (2019) confirmed that AI technologies impact teaching and learning, both positively and negatively, in the education industry. Hwang et al. (2020) and Yufeia et al. (2020) indicated that using AI in education had opened new avenues for developing more effective learning activities and better technology-enhanced learning applications or settings. The use of AI technology requires numerous key components, including education, such as teacher feedback, automatic grading systems, and adaptive learning. Akgun Greenhow (2021) and AI applications provide students with access to a variety of learning resources materials based on the subjects and learning needs they have.

As Kose (2014) noted, AI technology could be used to support distance e improve distance education when combined with other intelligent systems. Also, Owoc et al. (2019) demonstrated that the data governance of AI is interested in the organisation, collection, control, storage, and use of data. archival, and devastation. Additionally, Cheng et al. (2022) came to the conclusion that one major AI concern privacy is technology. Consequently, AI technologies have both good and negative consequences. Therefore, it is crucial to give AI in education top priority and apply suitable techniques to meet the requirements and expectations of teachers and students using AI technologies.

High academic performance will result as a result.

References

Akgun, S., & Greenhow, C. (2021). Artificial Intelligence in Education: Addressing Ethical Challenges in K-12 Settings. *AI and Ethics*, 1-10.

Alam, A. (2021). Possibilities and Apprehensions in the Landscape of Artificial Intelligence in Education. In *2021 International Conference on Computational Intelligence and Computing Applications* (ICCICA), pp. 1-8. IEEE.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *Ieee Access*, *8*, 75264-75278.

Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two Decades of Artificial Intelligence in Education: Contributors, Collaborations, Research Topics, Challenges, and Future Directions. *Educational Technology & Society*, *25*(1), 28-47.

Cheng, X., Su, L., Luo, X., Benitez, J., & Cai, S. (2022). The Good, the Bad, and the Ugly: Impact of Analytics and Artificial Intelligence-Enabled Personal Information Collection on Privacy and Participation in Ridesharing. *European Journal of Information Systems*, *31*(3), 339-363.

Dong, Y., Hou, J., Zhang, N., & Zhang, M. (2020). Research on How Human Intelligence, Consciousness, and Cognitive Computing Affect the Development of Artificial Intelligence. *Complexity*, *2020*, 1680845, 1-10.

Hashim, H. (2018). Application of Technology in the Digital Era Education. *International Journal of Research in Counseling and Education*, *2*(1), 1-5.

Holstein, K., McLaren, B. M., & Aleven, V. (2019). Designing for Complementarity: Teacher and Student Needs for Orchestration Support in AI-Enhanced Classrooms. *International Conference on Artificial Intelligence in Education*, 157-171.

Hwang, G. J. (2014). Definition, Framework and Research Issues of Smart Learning EnvironmentsA Context-Aware Ubiquitous Learning Perspective. *Smart Learning Enviro ments*, *1*(1), No.4, pp. 1-14.

Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, Challenges, Roles and Research Issues of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, *1*, 100001.

Jaipong, P., Nyen Vui, C., & Siripipatthanakul, S. (2022). A Case Study on Talent Shortage and Talent War of True Corporation, Thailand. *International Journal of Behavioral Analytics*, *2*(3), 1-

Available at SSRN: 4123711.

Kim, N. Y., Cha, Y., & Kim, H. S. (2019). Future English Learning: Chatbots and Artificial Intelligence. *Multimedia- Assisted Language Learning*, *22*(3), 32-53.

Kose, U. (2014). *Artificial Intelligence Applications in Distance Education*. IGI Global. Krutka, D., Manca, S., Galvin, S., Greenhow, C., Koehler, M., Askari, E. (2019). Teaching "Against" Social Media: Confronting Problems of Profit in the Curriculum. Teachers *College Record 121*(14), 1-42.

Li, J., Cheng, H., Guo, H., & Qiu, S. (2018). Survey on Artificial Intelligence for Vehicles. *Automotive Innovation*, *1*(1), 2-14.

Limna, P. (2022). Artificial Intelligence (AI) in the Hospitality Industry: A Review Article. *International Journal of Computing Sciences Research*, *6*.

Limna, P., Siripipatthanakul, S., & Phayaphrom, B. (2021). The Role of Big Data Analytics in Influencing Artificial Intelligence (AI) Adoption for Coffee Shops in Krabi, Thailand. *International Journal of Behavioral Analytics*, *1*(2), 1-17.

Luan, H., Geczy, P., Lai, H., Gobert, J., Yang, S.J., Ogata, H., Baltes, J., Guerra, R., Li, P., & Tsai, CC (2020). Challenges and Future Directions of Big Data and Artificial Intelligence in Education. *Frontiers in Psychology*, *11*, 580820.

Makridakis, S. (2017). The Forthcoming Artificial Intelligence (AI) Revolution: Its Impact on Society and Firms. *Futures*, *90*, 46-60.

Miao, F., Holmes, W., Huang, R., & Zhang, H. (2021). *AI and Education: A Guidance for Policymakers*. UNESCO Publishing.

Mitchell, M. (2019). *Artificial Intelligence: A Guide for Thinking Humans*. Penguin UK.

Ouyang, F., & Jiao, P. (2021). Artificial Intelligence in Education: The Three Paradigms. *Computers and Education: Artificial Intelligence*, *2*, 100020.Research Papers July 2022.

Owoc, M. L., Sawicka, A., & Weichbroth, P. (2019). Artificial Intelligence Technologies in Education: Benefits, Challenges and Strategies of Implementation. *IFIP International Workshop on Artificial Intelligence for Knowledge Management*, pp. 37-58.

Peters, M. A. (2020). Roboethics in Education and Society. *Educational Philosophy and Theory*, *52*(1), 11-16.

Rahmatullah, A. S., Mulyasa, E., Syahrani, S., Pongpalilu, F., & Putri, R. E. (2022). Digital Era 4.0: The Contribution to Education and Student Psychology. *Linguistics and Culture Review*, *6*, 89- 107.

Roll, I., & Wylie, R. (2016). Evolution and Revolution in Artificial Intelligence in Education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582.

Siripipatthanakul, S., & Bhandar, M. (2021). A Qualitative Research Factors Affecting Patient Satisfaction and Loyalty: A Case Study of Smile Family Dental Clinic. *International of Trend in Scientific Research and Development, 5 (5)*, 877-896.

Shabbir, J., & Anwer, T. (2018). Artificial Intelligence and Its Role in Near Future. *arXiv preprint arXiv:1804.01396*.

Tong-On, P., Siripipatthanakul, S., & Phayaphrom, B. (2021). The implementation of business intelligence using data analytics and its effects towards on performance in the hotel industry in Thailand. *International Journal of Behavioral Analytics*, *1*(2), 1- 16.

Yufeia, L., Salehb, S., Jiahuic, H., & Syed, S. M. (2020). Review of the Application of Artificial Intelligence in Education. *Integration (Amsterdam)*, *12*(8), 1-15.

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