JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

The Coexistence of AI and Teachers: Finding a Balance for the Future of Education.

[1]Uttam Mandal,

[1]Assistant Professor,
[1]Department of physics
[1]Bankura Sammilani College, Bankura-722102,West Bengal, India.

Abstract: As artificial intelligence (AI) continues to advance, there are concerns about its potential impact on the role of teachers in education. While some fear that AI will replace human teachers, others see it as a tool that can enhance teaching and learning. This article explores the coexistence of AI and teachers in education and argues that finding a balance between the two is crucial for the future of education. Drawing on current research and examples of AI in education, we examine the benefits and limitations of AI and the importance of human interaction and personalization in education. We also discuss the skills and competencies that teachers need to develop to effectively integrate AI into their teaching practice. Ultimately, we argue that AI and teachers can coexist in a complementary way, with AI serving as a valuable tool to enhance teaching and learning, while teachers continue to play a vital role in guiding and supporting students' academic and personal development.

Index Terms: Artificial intelligence, education, teacher, student.

I. Introduction:

Henry Ford used an illustration to show how innovation not imply that society should only pursue practices that have historically been accepted, such as developing methods of quicker horses. It's sometimes important to look outside the box and create fresh approaches. Make cars, which are quicker than horses and can transport people from Point A to Point B more quickly, as opposed to faster horses. The significant technological advancements that have occurred over the years, particularly in the field of education, have been driven by these concepts and methodologies[1]. We must acknowledge that digital technology are already ingrained in every aspect of our daily lives. They alter our methods of information gathering, interpersonal communication, and even behavior. As a result, changes have also started to occur in the educational scene. The number of educational programmes is increasing infuse the curriculum with digital culture. For instance, in France, even basic schools provide a few classes on internet technology, and high school students are required to complete a test demonstrating their proficiency with computers[2]. Additionally, many educational institutions have Learning Management Systems (LMS) like Moodle installed. Not just the educational curriculum was impacted by these developments. Interactive instructional technologies are growing in popularity over the past several years in a variety of ways. Students now use tablets in place of textbooks, while teachers make use of a variety of learning tools including Moodle, Google Classroom, Edmodo, and Power School. Massive Open Online Courses (MOOCs), such as those offered by coursera.com, are widely available for online study[3]. The rising number of engaged users of MOOCs courses demonstrates that society values electronic and remote learning approaches. Additionally, some of the courses might provide students a genuine chance to get an actual degree from a prestigious university. At the same time, we can see recent developments in artificial intelligence (AI), augmented reality (AR), virtual reality (VR), and their use in the educational process. Currently, the literature has a wide variety of definitions of AI. According to [4], “Artificial Intelligence is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment.

The rise of artificial intelligence (AI) has been a topic of discussion in many industries, and the field of education is no exception. In recent years, there has been an increase in interest in integrating artificial intelligence (AI) into education. AI has the ability to change how we interact with educational materials and how we learn and teach. As technology continues to evolve, there is a growing interest in exploring the potential of AI in education. Exploring the potential of AI in education is becoming more and more popular as technology develops and becomes more sophisticated[5]. The field of education may be significantly impacted by AI in a number of ways. Artificial intelligence (AI) has been widely used in educational practices as computing and information processing technologies have advanced, including intelligent tutoring programs, teaching robots, dashboards for learning analytics, adaptive learning programs, and human-computer interactions, to name a few examples[6].AI offers many benefits for education, including personalized learning experiences, increased efficiency, and improved analysis of student performance. However, there are also concerns about the potential negative impacts of AI on the role of teachers in education. The importance of finding a balance between AI and teachers in education cannot be overstated[7]. While AI can offer many benefits to students, it cannot replace the human interaction and personalized attention that teachers provide. Furthermore, there are limitations to what AI can do in terms of problem-solving and critical thinking. Therefore, it is essential to explore how AI and teachers can coexist in education and work together to create a better learning environment for students[8].

II. Benefits of AI in Education:

AI offers many benefits for education, including personalization, efficiency, and improved analysis of student performance. In order to make personalized recommendations and feedback, AI systems can analyse student data, including their learning preferences, progress, and style. Students may benefit from learning at their own pace and in the manners that work best for them as a result of this[9]. Administrative duties like scheduling and grading can be automated by AI, which will let teachers work more effectively and save time. One of the main advantages of AI in education is its ability to provide personalized learning experiences for students. AI algorithms can analyze student performance data and adapt the learning content to meet the needs of individual students. This can result in a more efficient and effective learning experience for students, as they are able to focus on the areas where they need the most help. Another benefit of AI in education is increased efficiency[10]. AI can automate many tasks that are traditionally performed by teachers, such as grading assignments and providing feedback to students. This can free up teachers' time, allowing them to focus on more important tasks such as guiding and supporting students.AI can also provide improved analysis of student performance. AI systems can analyse a lot of data to find patterns and trends in how students are performing. This information may cover a range of topics, including exam results, completed homework, attendance history, levels of involvement, and more. AI algorithms may find connections, trends, and patterns in this data that may not be immediately obvious to human observers by processing and analysing it[11]. AI can provide instructors and administrators with useful information about students' performance. They can pinpoint the areas in which children are doing well or poorly, monitor development over time, and discover potential causes of either success or difficulty for kids. This study can guide the creation of curricula, interventions, and instructional practices that support each student's unique requirements. AI-driven data analysis can help create early warning systems that can spot kids who could be in danger of falling behind or dropping out. Teachers can intervene proactively and offer kids the support they need to stay on course by seeing early warning signs. This can provide valuable insights for teachers, allowing them to adjust their teaching methods to better meet the needs of their students[12].

III. Limitations of AI in Education:

While AI offers many benefits for education, there are also limitations to what it can do. One of the main limitations of AI is its lack of empathy and personal touch. While AI algorithms can provide pupils personalized feedback and recommendations, they cannot offer the same level of emotional support and motivation that human teachers can. The learning process requires emotional support, especially for younger students who may require mentoring and encouragement to build resilience and self-confidence. Through one-on-one interactions, active listening, and compassionate replies, human teachers can offer emotional support to pupils and make them feel heard and respected[13]. Additionally, they can encourage and motivate people by praising them and giving them constructive criticism. Although AI programmes can offer some help and feedback, they lack the emotional intelligence and sensitivity of human instructors. A human instructor can provide students the same amount of individualized attention that AI cannot yet, nor is AI yet able to fully comprehend the subtleties of human emotions. This can be especially important for students who are struggling with personal or academic issues. Another limitation of AI in education is the potential for biases and errors. AI algorithms are only as good as the data that they are trained on. If the data is biased or incomplete, the AI algorithm can produce biased results[14]. Furthermore, AI algorithms can sometimes make errors that are difficult to detect and correct.AI also has limitations in terms of complex problem-solving and critical thinking. While AI algorithms can be trained to recognize patterns and make predictions based on data, they do not have the same level of creativity and critical thinking skills that human teachers possess. Human teachers offer a special set of abilities and traits to the classroom. They are able to engage in critical thinking, modify their teaching methods to suit the requirements of certain pupils, and encourage students' creativity and problem-solving abilities. Beyond the capabilities of AI algorithms, human teachers can offer insights, direction, and a variety of viewpoints. Teaching entails encouraging students' critical thinking, creativity, and deep understanding in addition to providing knowledge. Human teachers may lead debates, pose challenging questions, and inspire pupils to think for themselves and come up with original ideas[15]. While AI can offer helpful assistance in terms of data analysis, personalised feedback, and instructional materials, it is unable to match the depth and breadth of human contact or the capacity to inspire, motivate, and engage pupils in the same manner as a human instructor. The best strategy is to utilize the complementary strengths of human and AI teachers. Automation of administrative work, data-driven insights, and personalised learning experiences are all ways that AI might help teachers. While this is going on, human teachers may concentrate on establishing trusting bonds with their pupils, promoting critical thinking, and offering the emotional support and direction necessary for a well-rounded educational experience. Therefore, it is important to recognize the limitations of AI and the importance of human interaction in education[9].

IV. The Importance of Human Interaction in Education:

Despite all of AI's advantages, it's critical to acknowledge the fundamental role that interpersonal communication plays in education. Human interaction is an essential element of the learning process, especially when it comes to helping students develop their social and emotional abilities. Human teachers can give students individualized feedback, encouragement, and emotional support that artificial intelligence (AI) finds challenging to match[11]. Human teachers may create a good learning environment, modify their teaching strategies to fit the requirements and learning preferences of certain pupils, and coach and guide students. Human interaction is also necessary for fostering friendships among pupils as well as between students and professors. Students develop critical social and emotional abilities through interactions with their peers and teachers, including empathy, teamwork, communication, and dispute resolution[12]. These abilities are necessary for achievement in all spheres of life, including academic and professional accomplishment. The learning process can be improved and supported by AI, but human interaction should never be considered to be a replacement for it. Instead, AI and human instructors can collaborate in a complimentary way to give students the best learning experience possible[13]. We can give every student a more individualized, effective learning experience by integrating the benefits of both human and AI teachers. Teachers play a critical role in guiding and supporting students' academic and personal development. Human interaction is also important for social and emotional learning, which is essential for students' overall well-being. Furthermore, the skills and competencies that students need for success in the workforce

go beyond technical skills. Soft skills such as communication, teamwork, and problem-solving are also essential. These skills are best developed through human interaction and collaboration[14].

V. Integrating AI into Teaching Practice:

Integrating AI into teaching practice requires an understanding of AI and its potential uses in education. Teachers need to develop the skills and competencies to effectively integrate AI into their teaching practice. This includes understanding how to use AI tools to personalize learning experiences for students and how to analyze student AI offers many benefits for education, including personalization, efficiency, and improved analysis of student performance. Let's delve into these benefits in more detail:

A. Personalization and Adaptive Learning:

One of the main advantages of AI in education is its ability to provide personalized learning experiences for students. AI algorithms can analyze student performance data and adapt the learning content to meet the needs of individual students. This can result in a more efficient and effective learning experience for students, as they are able to focus on the areas where they need the most help[15]. Personalization and adaptive learning can be achieved through a variety of AI tools, such as adaptive learning platforms, chatbots, and intelligent tutoring systems. These tools use algorithms to analyze data on students' learning behavior, performance, and preferences, and adjust the content and pace of learning accordingly[16]. For example, an adaptive learning platform may present students with different learning materials or activities depending on their level of understanding of a particular concept. Personalization and adaptive learning can have a significant impact on student learning outcomes. Studies have shown that personalized learning can lead to higher levels of student engagement, motivation, and achievement. Additionally, adaptive learning has the potential to reduce the achievement gap between high- and low-performing students by providing targeted support for struggling students[17].

B. Efficiency and Scalability: Another benefit of AI in education is increased efficiency. AI can automate many tasks that are traditionally performed by teachers, such as grading assignments and providing feedback to students. This can free up teachers' time, allowing them to focus on more important tasks such as guiding and supporting students[18]. Efficiency and scalability can also be achieved through the use of AI-powered chatbots and virtual assistants. These tools can provide students with immediate support and feedback, reducing the need for human intervention. For example, a chatbot may be able to answer common student questions about course content, deadlines, or assignments, freeing up teachers to focus on more complex issues. In addition to increasing efficiency, AI can also make education more scalable. By automating certain tasks, AI can enable teachers to reach more students without sacrificing the quality of instruction. This is especially important in contexts where there is a shortage of qualified teachers or where access to education is limited[19].

C. Analyzing Student Performance and Progress: AI can also provide improved analysis of student performance. AI algorithms can analyze large amounts of data to identify patterns and trends in student performance. This can provide valuable insights for teachers, allowing them to adjust their teaching methods to better meet the needs of their students. For example, AI-powered learning analytics platforms can provide teachers with real-time data on student engagement, progress, and performance[20]. This data can be used to identify students who are struggling and provide them with targeted support. It can also be used to identify areas where the curriculum may need to be adjusted to better meet the needs of the students.AI can also help to identify potential learning gaps and challenges that may be missed by traditional assessment methods. For example, AI algorithms can analyze student writing samples to identify areas where students may be struggling with grammar or vocabulary. In conclusion, the benefits of AI in education are numerous and have the potential to transform the way that students learn and teachers teach[21]. From personalization and adaptive learning to efficiency and scalability, AI has the potential to improve the quality of education and make it more accessible to a wider range of students. Furthermore, by providing improved analysis of student performance and progress, AI can enable teachers to better meet the needs of their students and help them achieve their full potential[22].

VI. The Future of Education: Coexistence of AI and Teachers:

A. The potential for AI and teachers to work together in a complementary way:

AI has the potential to revolutionize the education system in many ways. For instance, AI-powered educational tools can be used to automate tasks such as grading and assessment, freeing up teachers to focus on more essential tasks such as teaching and mentoring students[23]. AI can also be used to personalize learning by providing students with individualized feedback and recommendations based on their learning styles, strengths, and weaknesses. Moreover, AI-powered chatbots and virtual assistants can provide students with 24/7 support, answering their questions, and providing guidance. However, it's essential to note that AI cannot replace human teachers[24]. Teachers bring a level of empathy, understanding, and emotional intelligence that AI cannot match. They can create a personal connection with students, provide encouragement, and support. In this way, teachers can work together with AI to create a better learning experience for students. The importance of finding a balance between AI and human interaction. While AI has many potential benefits, it's essential to find a balance between AI and human interaction in the classroom[25]. AI can never replace the human touch in education. Teachers must remain an essential part of the learning process, providing students with guidance, mentorship, and emotional support. AI should complement teachers' efforts, not replace them. Students need to interact with human teachers to develop social and emotional skills that cannot be taught through technology[26]. Moreover, it's essential to ensure that AI does not create a digital divide in education. Some students may not have access to the technology required to interact with AI, leading to further educational disparities[27]. Therefore, educators must find ways to ensure that all students have access to the benefits of AI-powered education.

B. The role of educators in shaping the future of education with AI:

Educators have a crucial role in shaping the future of education with AI. They must learn how to integrate AI-powered tools and technologies into their teaching methods effectively. Educators must also learn how to personalize learning for each student using AI and ensure that students with different learning styles are catered to Moreover, educators must take an active role in the

development and implementation of AI-powered educational tools. They must work with technology companies to ensure that the tools meet the needs of students and teachers. Educators must also advocate for policies that ensure that AI is used ethically and responsibly in education.AI has the potential to transform the education system, but it's crucial to find a balance between AI and human interaction. Teachers must remain an essential part of the learning process, providing students with guidance, mentorship, and emotional support. AI should complement teachers' efforts, not replace them. Educators must take an active role in shaping the future of education with AI, ensuring that students have access to the benefits of AI-powered education while also ensuring that technology is used ethically and responsibly.

VII. Conclusion:

The future of education is likely to see the coexistence of AI and teachers, where AI-powered educational tools complement human teachers' efforts. AI has the potential to revolutionize education by personalizing learning, automating administrative tasks, and providing 24/7 support to students. However, it's important to find a balance between AI and human interaction in the classroom to ensure that students develop social and emotional skills that cannot be taught through technology. It's essential to recognize that AI cannot replace human teachers, who bring empathy, understanding, and emotional intelligence to the learning process. Therefore, teachers must remain an integral part of the education system, providing students with guidance, mentorship, and emotional support. Educators must take an active role in shaping the future of education with AI. They must learn how to integrate AI-powered tools and technologies into their teaching methods effectively and advocate for policies that ensure that AI is used ethically and responsibly in education. By embracing AI as a tool for enhancing teaching and learning, educators can create a better learning experience for students and prepare them for the challenges of the 21st century. In summary, AI has the potential to transform education, but it's crucial to find a balance between AI and human interaction in the classroom. Teachers must remain an essential part of the learning process, and educators must embrace AI as a tool for enhancing teaching and learning while also ensuring that technology is used ethically and responsibly. By working together, AI and teachers can create a better learning experience for students, preparing them for the future.

References:

[1] L. Chen, P. Chen, Z. Lin, Artificial Intelligence in Education: A Review, IEEE Access. 8 (2020) 75264–75278. https://doi.org/10.1109/ACCESS.2020.2988510.

[2] L. Buckingham, R.S. Alpaslan, Promoting speaking proficiency and willingness to communicate in Turkish young learners of English through asynchronous computer-mediated practice, System. 65 (2017) 25–37. https://doi.org/10.1016/j.system.2016.12.016.

[3] M. Ali Baig, A. professor, D. Sreenivasa Chakravarthi, V. Varghese, A. Professor, B. Muntajeeb Ali, A. Professor, K. Venkata Nagendra, Influence of Artificial Intelligence Technology on Teaching Slow Learners "Effect of Open Source Learning Management System-MOODLE on student's achievement". View project Remte sensing View project Dharani Mundluru Sree Vidyanikethan Engineering College Influence of Artificial Intelligence Technology on Teaching Slow Learners, International Journal of Early Childhood Special Education (INT-JECS. 14 (n.d.) 2022. https://doi.org/10.9756/INTJECSE/V14I4.233.

[4] D. Wang, H. Han, Z. Zhan, J. Xu, Q. Liu, G. Ren, A problem solving oriented intelligent tutoring system to improve students' acquisition of basic computer skills, Comput Educ. 81 (2015) 102–112. https://doi.org/10.1016/j.compedu.2014.10.003.

[5] I. Roll, R. Wylie, Evolution and Revolution in Artificial Intelligence in Education, Int J Artif Intell Educ. 26 (2016) 582–599. https://doi.org/10.1007/s40593-016-0110-3.

[6] X. Chen, H. Xie, G.-J. Hwang, A multi-perspective study on Artificial Intelligence in Education: grants, conferences, journals, software tools, institutions, and researchers, Computers and Education: Artificial Intelligence. 1 (2020) 100005. https://doi.org/10.1016/j.caeai.2020.100005.

[7] S.A.D. Popenici, S. Kerr, Exploring the impact of artificial intelligence on teaching and learning in higher education, Res Pract Technol Enhanc Learn. 12 (2017) 22. https://doi.org/10.1186/s41039-017-0062-8.

[8] A. Alam, Employing Adaptive Learning and Intelligent Tutoring Robots for Virtual Classrooms and Smart Campuses: Reforming Education in the Age of Artificial Intelligence, in: 2022: pp. 395–406. https://doi.org/10.1007/978-981-19-2980-9_32.

[9] J.-Y. Kim, A study of students' perspectives on a flipped learning model and associations among personality, learning styles and satisfaction, Innovations in Education and Teaching International. 55 (2018) 314–324. https://doi.org/10.1080/14703297.2017.1286998.

[10] M. Hentea, M.J. Shea, L. Pennington, A perspective on fulfilling the expectations of distance education, in: Proceedings of the 4th Conference on Information Technology Curriculum, ACM, New York, NY, USA, 2003: pp. 160–167. https://doi.org/10.1145/947121.947158.

[11] K. Arispe, R.J. Blake, Individual factors and successful learning in a hybrid course, System. 40 (2012) 449–465. https://doi.org/10.1016/j.system.2012.10.013.

[12] B. Carl, J.T. Richardson, E. Cheng, H. Kim, R.H. Meyer, Theory and Application of Early Warning Systems for High School and Beyond, Journal of Education for Students Placed at Risk (JESPAR). 18 (2013) 29–49. https://doi.org/10.1080/10824669.2013.745374.

[13] S. Joshi, R.K. Rambola, P. Churi, Evaluating Artificial Intelligence in Education for Next Generation, J Phys Conf Ser. 1714 (2021) 012039. https://doi.org/10.1088/1742-6596/1714/1/012039.

[14] Y. Wang, When artificial intelligence meets educational leaders' data-informed decision-making: A cautionary tale, Studies in Educational Evaluation. 69 (2021) 100872. https://doi.org/10.1016/j.stueduc.2020.100872.

[15] P. Pataranutaporn, V. Danry, J. Leong, P. Punpongsanon, D. Novy, P. Maes, M. Sra, AI-generated characters for supporting personalized learning and well-being, Nat Mach Intell. 3 (2021) 1013–1022. https://doi.org/10.1038/s42256-021-00417-9.

[16] K.R. Prajwal, R. Mukhopadhyay, V.P. Namboodiri, C.V. Jawahar, A Lip Sync Expert Is All You Need for Speech to Lip Generation In the Wild, in: Proceedings of the 28th ACM International Conference on Multimedia, ACM, New York, NY, USA, 2020: pp. 484–492. https://doi.org/10.1145/3394171.3413532.

[17] J. Heer, Agency plus automation: Designing artificial intelligence into interactive systems, Proceedings of the National Academy of Sciences. 116 (2019) 1844–1850. https://doi.org/10.1073/pnas.1807184115.

[18] V. Kuleto, M. Ilić, M. Dumangiu, M. Ranković, O.M.D. Martins, D. Păun, L. Mihoreanu, Exploring Opportunities and Challenges of Artificial Intelligence and Machine Learning in Higher Education Institutions, Sustainability. 13 (2021) 10424. https://doi.org/10.3390/su131810424.

[19] I. Roll, R. Wylie, Evolution and Revolution in Artificial Intelligence in Education, Int J Artif Intell Educ. 26 (2016) 582–599. https://doi.org/10.1007/s40593-016-0110-3.

[20] M. Hooda, C. Rana, O. Dahiya, A. Rizwan, M.S. Hossain, Artificial Intelligence for Assessment and Feedback to Enhance Student Success in Higher Education, Math Probl Eng. 2022 (2022) 1–19. https://doi.org/10.1155/2022/5215722.

[21] H. Crompton, M. Bernacki, J.A. Greene, Psychological foundations of emerging technologies for teaching and learning in higher education, Curr Opin Psychol. 36 (2020) 101–105. https://doi.org/10.1016/j.copsyc.2020.04.011.

[22] J. Kim, A. Lee, H. Ryu, Personality and its effects on learning performance: Design guidelines for an adaptive e-learning system based on a user model, Int J Ind Ergon. 43 (2013) 450–461. https://doi.org/10.1016/j.ergon.2013.03.001.

[23] Y. Wang, When artificial intelligence meets educational leaders' data-informed decision-making: A cautionary tale, Studies in Educational Evaluation. 69 (2021) 100872. https://doi.org/10.1016/j.stueduc.2020.100872.

[24] A. Haldorai, S. Murugan, A. Ramu, Evolution, challenges, and application of intelligent ICT education: An overview, Computer Applications in Engineering Education. 29 (2021) 562–571. https://doi.org/10.1002/cae.22217.

[25] M.A. Kuhail, N. Alturki, S. Alramlawi, K. Alhejori, Interacting with educational chatbots: A systematic review, Educ Inf Technol (Dordr). 28 (2023) 973–1018. https://doi.org/10.1007/s10639-022-11177-3.

[26] Y. Chen, S. Jensen, L.J. Albert, S. Gupta, T. Lee, Artificial Intelligence (AI) Student Assistants in the Classroom: Designing Chatbots to Support Student Success, Information Systems Frontiers. 25 (2023) 161–182. https://doi.org/10.1007/s10796-022-10291-4.

[27] A. Haleem, M. Javaid, M.A. Qadri, R. Suman, Understanding the role of digital technologies in education: A review, Sustainable Operations and Computers. 3 (2022) 275–285. https://doi.org/10.1016/j.susoc.2022.05.004.