Chapter 3 - Envisioning the Future of Education with AI

Sunanda Vincent Jaiwant, Kiran Vazirani, Rameesha Kalra

Chapter Highlights

- This chapter highlights how AI and machine learning are having a powerful impact on the education sector. This impact is not only providing direct support to students but also making educators more attuned to student needs and less preoccupied with routine and repetitive tasks.
- Moreover, it emphasizes the necessity of AI for innovative approaches in education and points to a bright future in education. AI offers many benefits, such as enhancing learning, assisting teachers and promoting more effective individualized learning.
- This chapter also looks at how AI applications can be used in education. These applications include providing students with customized learning experiences, assisting teachers, and automated assessment and grading systems.
- In addition, this chapter addresses the ethical issues of using AI in education. In particular, it focuses on the ethical dimensions of teachers' and students' data privacy, security and learning processes.
- Finally, this chapter offers a future perspective on how AI can transform the education sector. It emphasizes the rapid increase in the use of artificial intelligence, especially at the global level, and its growing role in education.

Abstract

Artificial Intelligence (AI) and Machine Learning (ML) have significantly influenced the field of education, as it has not only provided direct assistance to students but has also enabled educators to better cater to individual learner requirements and reduce their involvement in monotonous and repetitive duties. There is a consensus that implementing novel methodologies in education is imperative, and it is widely acknowledged that artificial intelligence (AI) will serve as a significant enabling factor in fostering such innovation. Artificial intelligence (AI) holds much promise as a potential catalyst for transforming the future education landscape. Artificial intelligence (AI) plays a pivotal role in catalyzing transformative shifts within the field of education due to its numerous advantageous attributes. Artificial intelligence's use in education has significant promise in terms of augmenting learning outcomes, supporting educators, and facilitating personalized learning experiences. Ensuring equitable access for all students, regardless of their learning abilities or disabilities, is paramount. This is particularly significant due to the inherent variations in learning pace and skill sets across children. The utilization of artificial intelligence has the potential to enhance pupils' prospects for a successful future significantly. Integrating artificial intelligence (AI) into education has significant promise for revolutionizing the educational experience for all students. Numerous educational institutions worldwide have already implemented artificial intelligence (AI) technologies. This chapter provides a thorough examination of the application of artificial intelligence in the field of education. The authors discuss how artificial intelligence enhances educators' capabilities by providing them with improved teaching and learning methodologies. Artificial intelligence (AI) is revolutionizing educational methodologies and generating significant worldwide effects through the emergence of innovative educational models such as Massive Open Online Courses (MOOCs), blended learning, flipped classrooms, and other similar approaches.

Introduction and Theoretical Framework

The technology revolution is fuelling transformations in the education sector. AI is the new buzzword that is being adapted acceleratingly by education institutions and their stakeholders and is seen as a potential transforming agent in the teaching-learning process. The advent of the internet and mobile phones have propelled the education industry to a higher level of education ecosystem. The stakeholders of the education sector namely, students, parents, guardians, psychologists, instructors, and educational institutions have been impacted in their roles and functions by the arrival and adoption of technological advancement in the education sector.

Future online learning will integrate AI systems more thoroughly. It's vital to emphasize that the current study makes no claims that artificial intelligence systems would completely replace the need for human educators. Instead, AI systems and humans will collaborate closely in the future of online learning, thus it is crucial to employ these systems with awareness of their apparent benefits and limitations (Seo, et al., 2021).

All Students can have a customised education, because of Artificial Intelligence. Artificial intelligence (AI) has the potential to improve human teachers' skills to customize lessons to each student without throwing their class schedule off track. This would prevent teachers from having to provide stereotype instructions to the learners as

is commonly the case when students have a range of skill levels and learning abilities. Artificial intelligence's actual educational potential is found in the capacity the educators utilize it to interpret massive volumes of information about learners, educators, and their communications. AI ultimately has the potential to improve how well teachers understand their kids. In the coming years, artificial intelligence will play a significant role in the education industry though not upsetting the role of the teachers entirely. Education specialists strongly opined that artificial intelligence will enhance the teaching-learning experience not only for the learners but also for the instructors bringing a sea change in the teaching-learning process and will be adopted as one of the best practices to adopt and exercise (Ouyang, F. & Jiao, P., 2021).

AI is predicted to transform the way instructors perform their roles and duties and also revolutionize the way learners study and acquire knowledge. This prominent development will impact schools, colleges, and universities across the globe. The market research engine projects that by 2025, global spending on AI in education will reach $5.80 billion, with a yearly increase of 45 percent. (Harper, 2021).

Problem statement

Since most AI research is only conducted in STEM fields, collaborative efforts are required to address the growing uses of AI in education (AIEd) (Zawacki-Richter, et al., 2019). AI has been applied in education, more particularly in administration and teaching, and subsequently, influencing or impacting students' learning.

Research Questions

The following research questions have been addressed to elaborate upon AI and related technologies in education in this study:

1. What is the potential uses of AI technology and its academic advantages?
2. How is AI for educational purposes conceived and deliberated, and what ethical issues, difficulties, and risks are taken into account?
3. What kind and how broad are the uses of AI in various areas of learning?
4. What are the implications for future research and practice of AI in Education?

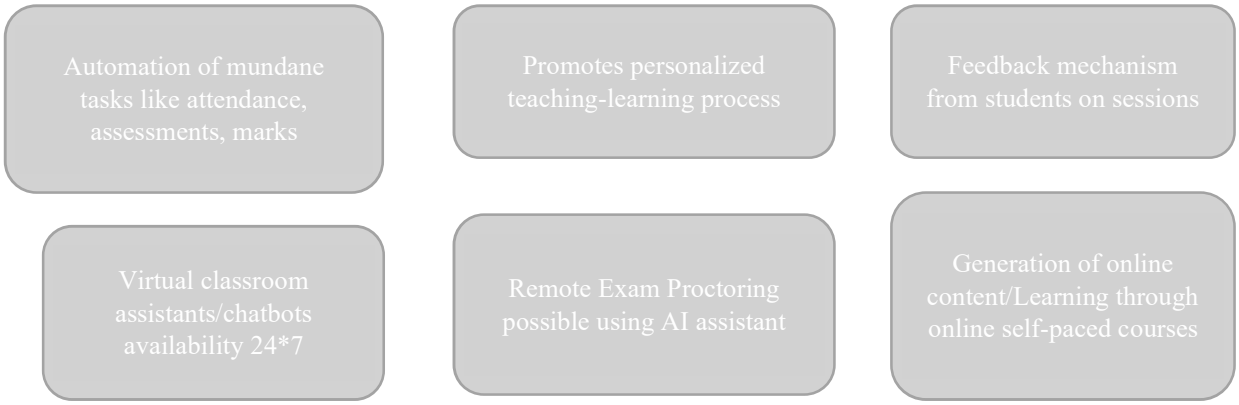
Brief Description of Claim and Position Statement

Educational technology is evolving to include artificial intelligence. Artificial intelligence will bring "human-like" features and agency into future technologies. Educational policy plays an important role in guiding the use of artificial intelligence in education to realize benefits while limiting risks.

Nature and Scope of AI Applications in Education

The overall development of a country depends upon its youth and undoubtedly quality education plays a significant role in driving a nation towards a better future. Not only does quality education serve as an important pillar of a nation's growth but also serves as a means to promote sustainability which is nothing but the ability to maintain processes over the long run. Sustainable development is an integrated approach that takes into consideration environmental and economic concerns in a balanced manner. To promote sustainable development, the United Nations has proposed 17 SDGs of which SDG4 aims to provide quality education and promotion of lifelong learning opportunities for everyone.

Technology has permeated many facets of our lives. As the education sector also embraces digital transformation, new tools and techniques are helping educators to customize learning plans for students based on their strengths and weaknesses. Since the needs of the students can be properly understood, individualized/personalized learning becomes possible for the learners. The education system in India suffers from the limitation of being theoretical without much emphasis on practical skills and experience. With the advent of AI in education, it is the right time for teachers to incorporate AI to automate their assessments and grading so that they can be provided with more time to concentrate on newer and innovative methods of teaching and also on student needs. Also, automation of mundane tasks like submission of attendance, automated grading, 24*7 access to resources, and so on. The inclusion of technology in education allows for new dynamics of interaction/implementation of learning methodologies in the classroom. (Leer, & Ivanov, 2013). AI can support the teaching-learning process in the following areas:



Source: Collated by authors

AI has huge potential in the education sector as it helps to automate routine/mundane tasks that can free the teachers to focus more on the generation of online content and prepare well for their sessions. One of the major challenges faced by educators is to ensure that the learning needs of all the learners are taken care of since the learners belong to the slow, medium, and advanced learner categories. This can be made possible through the use of AI in the form of differentiated/personalized learning which is impossible if educators have to manage the learning needs of various categories of students in a class. As per Hutchins (2017), personalized learning is "an approach that tailors educational content to the unique needs of the individual students."

Some of the applications and scope of AI in education have been explained below:

a. Personalized learning experience for learners
b. Development of digital content for different learning styles
c. Access to educational resources 24*7
d. Elimination of manual repetitive tasks that require more of the teacher's attention
e. Automated system of assessment and grading
f. Accessibility and immediate feedback about the sessions

The scope of AI in the education sector has indeed come a long way but technology won't be able to replace teachers anytime soon. Since teaching-learning is primarily based on human interaction, it will become impossible to incorporate technology into all facets of education. Implementation of AI is also giving a plethora of opportunities for the development of online courses. It is high time for universities and higher education institutions to plan their pedagogical models with AI solutions that will provide learners with lifelong learning.

International Bodies and AI in Education

Artificial Intelligence (AI) possesses great potential to accelerate a dramatic transformation and transition in the education sector. Some of the largest problems in education currently can be and are being skillfully addressed with AI. It is utilized to accelerate progress towards SDG 4 and innovative teaching and learning techniques. While ensuring that its use in educational contexts is guided by the fundamental principles of equitable and inclusive education (AI in Education), UNESCO is dedicated to assisting Member States in maximizing the potential of artificial intelligence (AI) technologies for attaining the Education 2030 Agenda (AI in Education). The mission of UNESCO encourages a people-first strategy for artificial intelligence. It proposes to broaden the contribution of AI to alleviating present educational inequality. Promoting AI will enhance accessibility to information, research, and a variety of social manifestations without widening the technological gaps within and between nations. UNESCO calls for an "AI for all" approach so that the benefits of innovation and knowledge through AI can be reaped by all stakeholders across the nations.

The publication created by UNESCO as part of the Beijing Consensus is also intended to help legislators in the field of education become better prepared for artificial intelligence. Practitioners and experts in the policy-making and educational sectors will find this publication, Artificial Intelligence and Education: Guidance for Policy-makers, of interest. It intends to foster an overall awareness of the possibilities for learning and difficulties presented by AI as well as the consequences for the fundamental skills required in the AI age.

UNESCO has initiated several projects that upholds the adoption of AI technology in academics aiming to augment learners' capabilities and to guard human from exploitation. AI can be effectively used for operative human-machine alliance teaching-learning processes leading to an overall sustainable development for all the

stakeholders. UNESCO hopes to collaborate with its patrons, partners, and international agencies to reinforce its leadership in AI in education and its status as an international think tank for innovative concepts., setting standards, framing policies, and building capacities.

Nations are encouraged to leverage emergent technologies like AI to strengthen the education sector to partner with UNESCO and benefit from technical, financial, and other contributions from UNESCO.

The development of laws, rules, and regulations about the application of artificial intelligence (AI) in education is heavily influenced by international organizations. These groups seek to make sure that AI is used efficiently and morally to improve educational outcomes. As we approach an era where artificial intelligence, an intersection of new technologies, is revolutionizing every part of the way we live, we need to reaffirm this commitment. We must drive this transformation with the proper objectives to raise living standards, lessen disparities, and advance a just equitable globalization.

UNESCO actively promotes the use of AI in education while placing a strong emphasis on equity, inclusivity, and ethical considerations. They seek to promote global cooperation, address potential issues, and create guidelines for AI in education. The Organization for Economic Co-operation and Development (OECD) carries out research and analysis on how developing technologies, such as AI, may affect education. They have released papers and suggestions on the use of AI in education, concentrating on topics including teacher preparation, data privacy, and digital literacy. The European Commission is heavily involved in the development of projects and policies relating to AI, notably those that concern education. Their "European Digital Education Plan" prioritizes integrating artificial intelligence and digital technologies into educational systems worldwide. ISTE (International Society for Technology in Education) is a multinational organization that promotes the use of technology in education, especially AI. To ensure the responsible and efficient use of AI in learning environments, they provide standards and guidelines for educators, decision-makers, and educational technology businesses. The International Telecommunication Union (ITU), an organization under the United Nations, strives to standardize AI technology, particularly those that are used in education. They encourage the creation of instructional tools powered by AI that follow international standards. Specifically in developing nations, the World Bank has been involved in projects that investigate the application of AI in education. They support the implementation of AI technologies for enhancing educational outcomes via financing and technological know-how. The Global Partnership for Education (GPE), which promotes education in developing nations, has acknowledged the potential of AI to address issues in education. They collaborate with partners to incorporate AI-driven programs into learning initiatives. The International AI in Education Society (IAIES) is an international group that is solely dedicated to using AI in education. They coordinate conferences, carry out research, and advance best practices in the application of AI to education. To address educational issues in the Global South, OpenAI, UNESCO, and the Commonwealth of Learning (COL) collaborated to create the AI in Education for Sustainable Development initiative. These global organizations work together with governments, academic institutions, and the corporate sector to create frameworks, rules, and guidelines that support the ethical and equitable use of AI in education. As a result of their work, educational possibilities are improved by AI technology while potential hazards and ethical issues are addressed.

AI in Education Conceptualized

Technology has at all times been a vital catalyst in the education sector, however, its present usage is excessively predominant unlike before owing to the amplified accessibility of smart devices and web-oriented educational programs, courses, and curricula. Owing to the upsurge of Artificial Intelligence in education processes and practices, there exist numerous platforms and methodologies that AI is being employed to benefit educators and learners. Artificial Intelligence possesses huge potential to revolutionize the entire education ecosystem and bring innovative changes for learners, educators, and educational institutions. It is viewed as a game-changer across the globe that has made education accessible, inclusive, and innovative, benefiting all the stakeholders of the education industry (Mohan, 2021).

Chatbots

Chatbots are the newly found AI educational apps now getting into the mainstream education activities and practices those learners have begun using increasingly. Schools are progressively implementing into their schoolrooms where students are taught to use computer systems, laptops, and other devices to communicate with chatbots that are developed to solve their queries and doubts regarding particular subjects or areas. Chatbots act like personal tutors for learners who not only clear their specific doubts but also teach certain topics and concepts in a personalized method. Chatbots are interactive ways of teaching for the students and are a big aid to the teachers.

Virtual Reality (VR)

Virtual Reality is a widely used technology in education. It makes teaching-learning very innovative and interesting. Virtual Reality is a digitally-powered setting that facilitates a deeper exploration and active interaction for the learners. Educators are using virtual reality in their classrooms integrating experiential learning making their learning process lively and interesting. VR brings the concepts, facts, information, events, etc. nearer to life and makes them real to the students making them feel connected to the concepts and each other. Students located in different classrooms and cities and even countries can get connected and interact conveniently discussing different topics and research areas. Educators can increase student engagement using VR making the teaching more engaging and interactive.

Learning Management System (LMS)

Learning Management System is not a very new technology for the educational sector. A learning management system offers a centralized, spontaneous teaching structure that manages most of the educational assignments and tasks of any educational institution. LMS technology and tools are utilized for several activities like coursework assignments, communicating with the learners, communicating with the parents, tracking the status and progress of the students, assessing the student's performance, generating reports, etc.

These systems make it possible to house all elements of a course in a single location, including instruction, assignments, tests, and grading. This implies that instructors are always free to offer input on any project or test. Without having to wait until the conclusion of the semester, students may view their marks right away. AI-based LMS empowers teachers to create interactive content and teaching materials for the students. Parents can monitor their children's performance and progress with the help of AI-powered LMS.

Robotics

Robotics powered by Artificial Intelligence are now increasingly used in education and have been seen as a great tool to engage students and give them more practical-oriented learning. Many schools and colleges have begun using robotics technology in their teaching-learning process. The educators and learners can dig deeper exploring new topics and concepts. Robotics allows the learners to give time to themselves and learn on their own. Robots facilitate self-learning that broadens the learning capacity of the learners. Robots offer an innovative learning platform that creates and develops problem-solving skills in learners. Allowing them to perceive the outcomes of their experiments and works. Educators also benefit from using robotics technology while teaching science, geography, and maths making their classes more creative and practical.

Ethical Implications

AI has branched out in every walk of human life. This, however, gives rise to misuse of AI and badly curated AI tools that cause irretrievable damage to human lives and property including the entire civilization. Artificial Intelligence ethics includes a combination of methods, standards, philosophies, practices, and techniques employing commonly recognized standards of ethical conduct in developing and deploying Artificial Intelligence technologies. AI ethics focuses on issues and impasses related to AI technologies and tools to ensure that such technologies and activities should not present a menace to human lives, society, or the environment in the coming years. AI Ethics navigates technologies that essentially assure a safe, secure, and eco-friendly self-governing system in interaction with human beings (Fourtané, 2020).

Business tycoons, AI scientists, and data science engineers have confessed the power of AI in human decision-making and business activities. This new age power of AI should be kept under control to end any kind of perilous possibilities of AI-fuelled destruction in the future (Johnson, 2019). Even global bodies like UNICEF and OECD have recognized the need for better transparency and accountability in AI-technology practices and activities to facilitate more meaningful and safe information dissemination and decision-making (Schaper, et al., 2020).

Research studies have revealed human-centered reflections raising the consideration of instructing people to be more socially responsible and ethical users (Teredesai, et al. 2020). Gong et al. established that learners give lesser heed to moral issues such as prejudice in AI and legal accountability, and intellectual property (Gong, et al., 2020). Studies revealed that AI ethics have a greater number of human-based issues like inclusivity, equality, responsibility, transparency, and integrity which outnumber concerns such as increasing learners' AI aptitudes, skills, and interests (Hagendorff, 2022). For example, Lin et al. (2021), developed a middle-school program that

focussed on AI literacy integrating AI-concepts, ethics, awareness and careers. The research work proposed a groundwork for forthcoming AI-based businesses that would be built on inclusiveness principles, offer equal opportunities, take into account numerous parties and possible consumers, and reduce the possibility of discrimination. It is now a fact that to build an inclusive environment it is needed to encapsulate and conceptualize AI literacy with human-centered deliberations.

Challenges and Risks in AI Application

Expeditious technological development inexorably brings numerous threats and difficulties that have surpassed policy discussions by a significant margin and governing structures. Erik mentioned in his article that AI will have a significant impact on how radiology and healthcare are practiced. Radiologists' performance can be enhanced by AI, and the combined performance of radiologists and AI will be superior to either one alone. In remote regions and underdeveloped nations, AI will be able to offer very efficient and affordable diagnostic services, hence boosting the availability of healthcare for countless individuals (Ranschaert, et al., 2019). Peter discussed the areas where AI can enhance the military application. Areas such as Surveillance, Underwater mine warfare, and Cyber Security can be supported and improvised by technology (Svenmarck, et al., 2018). Mentioned in his working papers are the AI potentials that are especially beneficial in achieving several of the world's SDG 4 international academic goals, including making sure all students receive accessible, equal education, and encouraging prospects for continuous education for everyone. The paper also discussed AI implications for instructions and AI applications for Schools and Management separately (Vincent-Lancrin, & Van der Vlies, 2020). The summary includes:

AI applications	
AI applications for teaching	• Personalizing learning with AI • Supporting students with special needs with AI • Online and blended learning – AI-enabled Chatbox • Different types of sensors and cameras to enhance student engagement and classroom dynamics • Using multi-lingual instructions
AI applications for system and school management	• unbiased assessments – qualitative and quantitative • early warning systems to reduce dropouts • A large number of audience/students can be monitored • Game-based or simulation methods of assessment to access complex skills

Source: Vincent-Lancrin, & Van der Vlies, 2020

Challenges

The use of artificial intelligence (AI) in education opens up several opportunities to enhance learning, but it also presents several obstacles that must be resolved. It is crucial for stakeholders, including educators, policymakers,

technology developers, and academics, to collaborate to design and execute ethical AI in education methods that put equality, ethics, and student well-being first to overcome these obstacles. This entails open data practices, continual professional development for teachers, and the creation of laws that support fair and equal access to AI-powered educational tools.

Trust: The unknowable nature of how deep learning models forecast the output is one of the most significant problems that worry AI. Some applications of AI might be infrastructure-based and covert, raising questions regarding transparency and reliability. AI frequently enters new applications with a mystic air, but educators and procurement rules demand that EDTech demonstrate effectiveness. AI may offer information that seems real but is false or has no basis in reality. The risk of scaling pattern detectors and automation that result in "algorithmic discrimination" (e.g., systematic unfairness in the learning opportunities or resources recommended to some populations of students) is among the most significant new risks that AI introduces in addition to the well-known data privacy and data security risks.

Privacy and Security: Technology always has to face this as a concern, where the data so stored by technology always has a threat of being hacked or misused. This has been one of the major challenges for technologists to ensure the updation of data security systems to safeguard the personalized micro and macro-level data for the right usage.

Determining the right and complex methods: Artificial intelligence is the technological system that helps human beings overcome routinized processes. But to execute these tasks with the help of machines, it is required to program the machine with all sorts of possible outcomes. It is required to understand every possible expectation and the right roadmap for the assessment.

Data storage: The advantage of AI is the data management in one system which can be used for reference at any point of time in the future. However, the major challenge that an AI-enabled system faces is the data storage system, which should have the capability of understanding and storing the programs as well as the interaction data.

Modelling issues: The programming of the right model, should have all the possible outcomes, which has all possible ways of assessing qualitative and quantitative skills. The right programming that can support the teaching and learning process should be the perfect model with all possible ways to provide solutions to the learners.
Chances of incorrect output: AI is a human-programmed system that will execute the task as instructed by human beings but at the same time it only gives the output as programmed. The programmer has to look forward to all possible outcomes, and all possible ways to assess the learner.

Robots stealing jobs: AI which runs with only machines will take away human jobs. Because the objective of AI-enabled applications is just to support humans with a few routined processes. And that’s how AI will act as a substitute for the jobs executed by human beings.

Conclusion

Global trends in different industries are focusing more on personalization in all their activities owing to the arrival of Artificial Intelligence. AI has revolutionized the entire education sector globally. AI is one of the biggest technological tools that is a big boon to teachers and facilitators who can have all the information related to their subjects and courses at the tip of their fingers. AI empowers educators to create innovative and interactive educational content that ensembles their learners in the best possible way and ensures effective personalized learning. AI also helps in automating routine and repetitive tasks, giving more fruitful and productive time for the instructors for an impactful teaching environment. However, the increased use of AI in the education sector leads to more possibilities of danger that ought to be addressed with strong AI systems. It is paramount that probable perils need to be identified that are triggered by faulty and poorly designed AI systems. Business organizations, policymakers, and government agencies should anticipate and plan effective actions to respond to and implement at the earliest. Individuals, corporate houses, and government can undertake efforts to avert future probable problems by creating an environment of responsible behavior towards innovation and integration of technologies to design and execute ethical, fair, and safe AI tools and systems. All stakeholders embroiled in designing, producing, and deploying projects should emphasize AI ethics and safety as a supreme priority.

References

Artificial Intelligence In Education. (n.d.). https://www.unesco.org/en/education/digital/artificial-intelligence.

Artificial Intelligence Research, Development and Regulation Adopted by the IEEE-USA Board of Directors, 10 Feb. 2017

Fourtané, S. (2020, August 27). Ethics of AI: Benefits and Risks of Artificial Intelligence Systems. Retrieved from https://interestingengineering.com/innovation/ethics-of-ai-benefits-and-risks-of-artificial-intelligence-systems

Gong, X., Tang, Y., Liu, X., Jing, S., Cui, W., Liang, J., & Wang, F. Y. (2020, October). K-9 artificial intelligence education in Qingdao: Issues, challenges and suggestions. In 2020 IEEE international Conference on networking, Sensing and control (ICNSC) (pp. 1-6). IEEE.

Hagendorff, T. (2022). Blind Spots in AI Ethics. *AI and Ethics*, 851–867. doi:https://doi.org/10.1007/s43681-021-00122-8

Harper, T. (2021, August 25). *Top 7 Ways Artificial Intelligence Is Used in Education.* Retrieved from https://trainingmag.com: https://trainingmag.com/top-7-ways-artificial-intelligence-is-used-in-education/

Hutchins D. AI Boosts Personalized Learning in Higher Education // EdTech. 2017

Johnson, K. (2019, November). AI Ethics Is All About Power. Retrieved from https://venturebeat.com/ai/ai-ethics-is-all-about-power/

Leer, R., & Ivanov S. (2013). Rethinking the future of learning - The possibilities and limitations of technology in education in the 21st century. Int. J. Organ. Innov, Vol. 5, 14–20.

Lin, P. Y., Chai, C. S., Jong, M. S. Y., Dai, Y., Guo, Y., & Qin, J. (2021). Modeling the structural relationship among primary students' motivation to learn artificial intelligence. Computers and Education: Artificial Intelligence, 2, 100006.

Mohan, P. (2021, Decemberr 10). Artificial Intelligence in education. Times of India. Retrieved from https://timesofindia.indiatimes.com/readersblog/newtech/artificial-intelligence-in-education-39512/

Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence, 2*. doi:https://doi.org/10.1016/j.caeai.2021.100020

Ranschaert, E. R., Duerinckx, A. J., Algra, P., Kotter, E., Kortman, H., & Morozov, S. (2019). Advantages, challenges, and risks of artificial intelligence for radiologists. Artificial intelligence in medical imaging: opportunities, applications and risks, 329-346.

Schaper, M., M., Malinverni, L., & Valero C. (2020). Robot Presidents: Who should rule the world? Teaching Critical Thinking In AI Through Reflections Upon Food Traditions. *11th Nordic Conference On Human-Computer Interaction: Shaping Experiences* (pp. 1-4). Shaping Society . doi:https://doi.org/10.1145/3419249.3420085

Seo, K., Tang, J., Roll, I. et al. (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. *International Journal of Educational Technology in Higher Education , 18*(54). doi:https://doi.org/10.1186/s41239-021-00292-9

Svenmarck, P., Luotsinen, L., Nilsson, M., & Schubert, J. (2018, May). Possibilities and challenges for artificial intelligence in military applications. In Proceedings of the NATO Big Data and Artificial Intelligence for Military Decision Making Specialists' Meeting (pp. 1-16).

Teredesai, A., Ahmad, M., A., Eckert, C. (2020). Fairness, Accountability, Transparency in AI at Scale: Lessons from National Programs. *Proceedings of the 2020 ACM Conference on Fairness, Accountability, and Transparency.* doi:10.1145/3351095.3375690

Vincent-Lancrin, S., & Van der Vlies, R. (2020). Trustworthy artificial intelligence (AI) in education: Promises and challenges. OECD Education Working Papers No. 218.

Zawacki-Richter, O., Marín, V., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education -where are the educators? *International Journal of Educational Technology in Higher Education*, *16*, 1-27. https://doi.org/10.1186/s41239-019-0171-0

Author Information

Sunanda Vincent Jaiwant
https://orcid.org/0000-0002-1161-5970
CHRIST (Deemed to be University)
Bangalore
India
Contact e-mail: *sunanda.vincent@christuniversity.in*

Kiran Vazirani
https://orcid.org/0000-0001-5591-6874
CHRIST (Deemed to be University)
Bangalore
India

Rameesha Kalra
https://orcid.org/0000-0001-6274-6324
CHRIST (Deemed to be University)
Bangalore
India

Citation

Jaiwant, S. V., Vazirani, K., & Kalra, R. (2021). Envisioning the future of education with AI. In A. Kaban & A. Stachowicz-Stanusch (Eds.), *Empowering Education: Exploring the Potential of Artificial Intelligence* (pp. 31-43). ISTES Organization.