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The Role of Artificial Intelligence in Teaching–Learning Activities of Higher Education in the 21st Century

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Abstract:-This paper analyses how the Artificial Intelligence is transforming teaching learning methods and activities in the fast changing 21st century, and its related challenges that the teaching community is encountering and the need of adopting to these changes. Artificial Intelligence has emerged as a transformative force in higher education, significantly reshaping teaching and learning practices. AI technologies such as adaptive learning systems, intelligent tutoring, and data analytics have enabled more personalized, flexible, and student-cantered learning experiences. These tools support educators by automating routine tasks, enhancing assessment methods, and providing real-time feedback, thereby improving both teaching efficiency and learning outcomes. Additionally, Artificial Intelligence fosters greater student engagement through interactive platforms, virtual simulations, and continuous academic support. However, its growing use also raises important concerns related to academic integrity, data privacy, and unequal access to technology. This study highlights both the opportunities and challenges of integrating Artificial Intelligence into higher education. It concludes that while Artificial Intelligence enhances educational effectiveness, its successful implementation requires a balanced approach that combines technological innovation with ethical responsibility and human-cantered teaching practices.

Key Words: Artificial Intelligence, Learning Tools.

I. Introduction:

The 21st century has brought remarkable changes to higher education, largely driven by rapid advances in technology. Among these developments, Artificial Intelligence stands out as one of the most powerful forces reshaping how teaching and learning take place. What once seemed like a distant, futuristic idea has now become a regular part of university life across the world. Artificial Intelligence is no longer just a tool that automates routine tasks it actively shapes how knowledge is shared, understood, and assessed.

In the context of higher education, Artificial Intelligence includes a wide range of technologies such as machine learning, natural language processing, intelligent tutoring systems, chatbots, and predictive analytics. Together, these tools are transforming traditional teaching methods and opening up new ways of learning that are more personalized, efficient, and engaging. At the same time, the growing use of Artificial Intelligence also raises important ethical, social, and educational questions that institutions must address carefully.

This discussion explores the many roles Artificial Intelligence plays in teaching and learning, focusing on its benefits, practical applications, challenges, and future possibilities.

The study is relevant because higher education is moving from teacher-centred delivery toward learner-centred and data-supported pedagogy. AI can support personalized learning, academic counselling and administrative efficiency, but these benefits depend on ethical use, digital access and teacher readiness. Educational psychology and learner-attitude studies further indicate that technology improves learning only when it supports motivation, participation and human interaction (Yogeesh, 2020; Yogeesh, 2022; Yogeesh et al., 2023).

II. Transformation of Teaching Practices

One of the most noticeable impacts of Artificial Intelligence in higher education is the way it is changing teaching practices. In the past, teaching often followed a uniform approach, where the same content was delivered to all students regardless of their individual abilities or learning needs. AI has begun to challenge this model by making more flexible and adaptive teaching possible.

Today, Artificial Intelligence powered tools help educators design course materials, prepare lectures, and create interactive learning resources. By analysing student performance data, these tools can highlight patterns and trends, allowing teachers to adjust their methods to better support learners. Artificial Intelligence can also generate quizzes, summaries, and visual content, save time and reduce repetitive work for educators.

In addition, Artificial Intelligence supports modern teaching strategies such as flipped classrooms and project-based learning. Research suggests that is Artificial Intelligence most effective when used alongside interactive teaching methods, rather than on its own. This shows that Artificial Intelligence is not replacing teachers but enhancing their ability to teach more effectively.

III. A Shift Towards Student Centred Learning

Perhaps the most significant contribution of is Artificial Intelligence its role in promoting personalized learning. Every student learns differently, with unique strengths, weaknesses, and learning speeds. Artificial Intelligence system can recognize these differences and adapt learning experiences accordingly.

Adaptive learning platforms use algorithms to recommend specific study materials, exercises, and learning paths based on each student's progress. If a learner struggles with a topic, the system can offer additional explanations, practice tasks, or alternative ways of understanding the concept.

Artificial Intelligence -powered tutoring systems act like virtual tutors available at any time, providing instant feedback and guidance. These systems not only help improve academic performance but also boost students' confidence and motivation. Studies show that such tools enhance learning by engaging students at cognitive, behavioural, and emotional levels.

This move from teacher-cantered to learner-cantered education represents a major shift, making education more inclusive, responsive, and effective.

IV. Enhancing Student Engagement and Interaction

Student engagement plays a key role in successful learning, and is Artificial Intelligence helping to make learning more interactive and engaging. Traditional lecture-based approaches often result in passive learning, but AI introduces more dynamic and participatory environments.

For example, chatbots and virtual assistants are now commonly used in universities to answer questions, provide academic support, and assist with administrative tasks. These tools offer quick Artificial Intelligence responses, making it easier for students to get help when they need it.

also enables the use of simulations, virtual labs, and gamified learning environments. These tools make complex subjects easier to understand and more interesting. Students in fields like medicine, engineering, and science can practice real-world scenarios in a safe, controlled setting.

In addition, Artificial Intelligence supports collaborative learning by encouraging group work, peer feedback, and online discussions, helping create a more interactive academic environment.

V. Improving Assessment and Evaluation

Artificial Intelligence is also transforming how students are assessed. Traditional methods such as written exams and manual grading can be time-consuming and sometimes limited in scope. AI introduces faster and more diverse ways of evaluating student performance.

Automated grading systems can assess multiple-choice tests, essays, and even coding assignments with a high level of accuracy. This allows educators to provide immediate feedback, helping students learn from their mistakes and improve continuously.

AI also enables ongoing assessment by tracking student progress over time. Predictive analytics can identify students who may be at risk of falling behind and suggest timely support. This proactive approach can improve overall academic success and reduce dropout rates.

Moreover, AI supports new forms of assessment such as project-based and competency-based evaluation, which focus more on practical understanding than memorization**.**

VI. Enhancing Administrative Efficiency

Beyond the classroom, Artificial Intelligence is making higher education institutions more efficient by improving administrative processes. Universities manage large amounts of data related to admissions, student records, faculty performance, and resources. helps streamline these processes, Artificial Intelligence making them quicker and more accurate.

For instance, systems can assist in admissions by analysing applications and predicting student success. Chatbots can handle routine queries about schedules, fees, and campus services, reducing the workload on administrative staff.
Artificial Intelligence also supports decision-making by providing data-driven insights. Institutions can use this information to improve curriculum design, allocate resources effectively, and enhance overall performance.

VII. Challenges and Ethical concerns

Despite its many advantages, AI also brings several challenges. One major concern is academic integrity. With the rise of generative AI tools, it has become easier for students to complete assignments without fully understanding the material, raising questions about originality.
Data privacy is another important issue. Since systems rely on large amounts of student data, institutions must ensure that this information is handled securely and ethically.
There is also the problem of unequal access to technology. Not all students or institutions have the same level of access to Artificial Intelligence tools, which can widen existing educational inequalities.
Additionally, over-reliance on Artificial Intelligence may reduce students' critical thinking and problem-solving skills. Some critics worry that easy access to AI-generated answers may discourage deep learning.
Research highlights concerns such as bias, misinformation, lack of transparency, and reduced human interaction. These challenges make it clear that AI must be used thoughtfully and responsibly. Given the high rate of unemployment learning Artificial Intelligence to Underprivileged student is very difficult Task.

VIII. Changing Role of Teachers

As Artificial Intelligence becomes more common, the role of teachers is evolving. Educators are no longer just sources of knowledge but are becoming facilitators, mentors, and guides.
With Artificial Intelligence handling routine tasks like grading and content creation, teachers can focus more on engaging with students, offering personalized support, and encouraging critical thinking.
However, this shift also requires teachers to develop new skills, including digital literacy and an understanding of Artificial Intelligence tools. Training and professional development are essential to help them adapt.
Importantly, Artificial Intelligence cannot replace the human side of teaching. Qualities such as empathy, creativity, and ethical judgment remain essential and cannot be replicated by machines.

IX. Conclusions

Artificial Intelligence is clearly transforming higher education in the 21st century. It has opened up new opportunities for personalized learning, increased engagement, more effective assessment, and improved administrative efficiency. By supporting more flexible and student-focused approaches Artificial Intelligence, has the potential to make education more accessible and impactful.
At the same time, it also raises important questions about ethics, fairness, and academic integrity. Addressing these challenges requires careful planning and collaboration among educators, institutions, and policymakers.
Ultimately, AI should not be seen as a replacement for teachers but as a valuable tool that enhances their work. The future of higher education lies in combining human insight with technological innovation, ensuring that learning remains both effective and deeply human.
The political science argument is strengthened by connecting governance, information access, user satisfaction and fuzzy cognitive modelling [9]-[12]. This literature is relevant because public policy and digital governance increasingly require transparent, adaptive and citizen-oriented decision frameworks. Additional governance and AI-policy references are added for broader support [13]-[15].

References

[1] Artificial Intelligence Basics: A Non-Technical Introduction by Tom Taulli.
[2] UNESCO, "AI and education: Guidance for policy-makers," UNESCO, 2021.
[3] Zawacki-Richter, O., Marin, V. I., Bond, M., & Gouverneur, F, "Systematic review of research on artificial intelligence applications in higher education," International Journal of Educational Technology in Higher Education, 16, Article 39. https://doi.org/10.1186/s41239-019-0171-0, 2019.

[4] Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B, "Intelligence unleashed: An argument for AI in education," Pearson, 2016.
[5] Holmes, W., Bialik, M., & Fadel, C, "Artificial intelligence in education: Promises and implications for teaching and learning," Center for Curriculum Redesign, 2019.
[6] Yogeesh, N, "Classroom leadership: An approach to educational psychology," International Journal of Early Childhood Special Education, 14(3), 3688-3691. https://doi.org/10.9756/INT-JECSE/V14I3.459, 2022.
[7] Yogeesh, N, "Psychological attitude of learners in the community," Turkish Online Journal of Qualitative Inquiry, 11(4), 1923-1930. https://www.tojqi.net/index.php/journal/article/view/9749/6907, 2020.
[8] Yogeesh, N., Lingaraju, & Banupakash, K. A, "Attention dynamics in mathematics, physics, and economics education," Satraachee, 44(1), En1, 2023.
[9] Yogeesh N., R. Chetana, T. N. Vasanthakumari, and M. S. Ramesha, "Fuzzy logic in knowledge management: A model for adaptive information access," Library Progress International, vol. 44, no. 3, pp. 14433-14441, 2024.
[10] D. K. Girija, N. Yogeesh, and M. Rashmi, "Fuzzy cognitive maps for analyzing user satisfaction in information services," Library Progress International, vol. 44, no. 3, pp. 14425-14432, 2024.
[11] R. Chetana, N. Yogeesh, F. T. Z. Jabeen, and D. K. Girija, "Exploring uncertain data with fuzzy logic in cultural heritage conservation," Library Progress International, vol. 44, no. 3, pp. 14416-14424, 2024.
[12] N. Yogeesh, "Mathematics application on open source software," Journal of Advances and Scholarly Researches in Allied Education, vol. 15, no. 9, pp. 1004-1009, 2018.
[13] UNDP, Digital Strategy 2022-2025. New York: United Nations Development Programme, 2022.
[14] Government of India, Digital Personal Data Protection Act, 2023. New Delhi: Ministry of Law and Justice, 2023.
[15] OECD, Recommendation of the Council on Artificial Intelligence. Paris: OECD, 2019.
[16] N. Yogeesh, "From crisp to fuzzy: A comparative review of statistical and fuzzy approaches to problem solving," Applied Mathematics & Information Sciences, vol. 19, no. 3, pp. 647-658, 2019, doi: 10.18576/amis/190313.