Review Article

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Constructive perspectives: an influence of generative ai in teaching and learning

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Abstract

In 21st century education, the presence of AI is inevitable. Generative AI (GenAI) has emerged as one of the fastest technology take-ups in human history. Generative AI is transforming education by offering both exciting opportunities and presenting significant challenges. Technology works best as a tool used by great teachers, and it is important to take a joined-up pedagogical approach. Generative AI is increasingly being integrated into education to enhance teaching and learning experiences. AI in education has become one of the most significant innovations that has the potential of improving the quality of education, adapting teaching and learning to individual needs, and optimizing the management of educational institutions.Gen AI has the potential to impact the future of teaching and learning in various ways, such as changing how skill and knowledge assessments are designed and scored, experiences and teachers. As the technology evolves, its role in the classroom will likely continue to expand, offering even more opportunities for innovation and improvement.

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INTRODUCTION

Education is undergoing a profound transformation due to technological innovation, a greater focus on individualized learning, and an increased emphasis on preparing students for the complexities of the modern world. As these trends continue, education is becoming more flexible, accessible, and relevant to diverse learning needs. The key challenge moving forward is ensuring that these advancements are

inclusive, equitable, and enhance the overall educational experience for all students. Generative AI has great potential to revolutionize education by offering more personalized, efficient, and creative learning opportunities.Teachers, students and experts have acclaimed the impact of Generative AI in education in reshaping teaching and learning approaches.The rapid advancement of GenAI in education, and the swift growth of its tools such as ChatGPT, Gemini, and CoPilot offer ample opportunities to enhance learners' learning through collaborative learning, computational thinking, educational psychology, and learning analytics.

Generative AI

Generative AIalso called Gen AI referred to a type of artificial intelligence that can create original content such as images, text, music and even software code.Generative AI creates new, original outputs by learning patterns, structures, and styles from large datasets.

The Rise of Generative AI

Generative AI in Teaching and Learningreferred to the use of advanced artificial intelligence tools that can create, generate, or assist in producing educational content and resources for teaching and learning in the present educational atmosphere. In the context of teaching and learning, Generative AI is used in various ways to enhance both the learning process for students and the teaching process for educators.

GenAI can offer educators efficient, accurate, and impartial assessment services by automating the grading of homework. Generative AI can produce new data that mimics the original. For example, it can write new articles, create realistic images, or generate music tracks and can write essays, answer questions, and hold conversations.

Usage of Generative AI in the Classroom.

Generative AI applications are increasingly being integrated into teaching and learning environments to enhance educational experiences.

Personalized Learning

Generative AI can create individualized learning paths for students. By analysing a student's progress, strengths, and weaknesses, it can also generate customized lessons, quizzes, and practice materials.

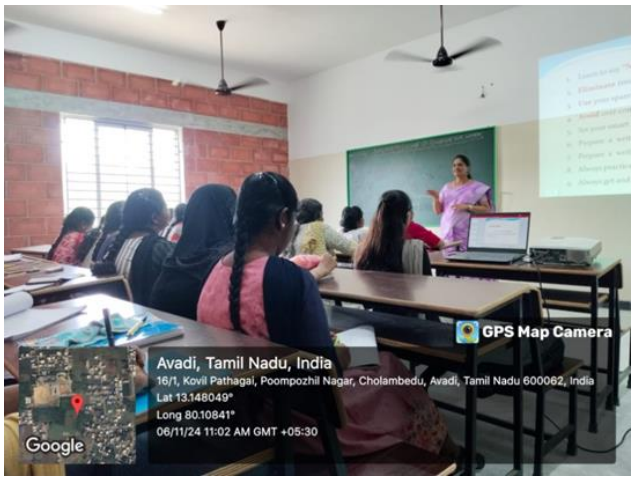

Figure 1 Picture showing the Gen.AI creates individualized learning paths for students

Content Creation

With the support of Gen (AI) tools can assist educators in creating teaching materials quickly, generate lesson plans based on curriculum standards, create textbooks, articles, or summaries on complex topics, making content quieter easy for students. It can also generate images, diagrams, or even videos to illustrate concepts in a more engaging way.

Automated Assessment and Feedback

Generative AI is used to design quizzes, tests, and assessments. AI systems can also automatically grade assignments and offer instant feedback. This automation reduces the administrative burden on teachers and

provides students with timely feedback, which is crucial for their learning process.

Collaborative Learning

AI can support collaborative projects by helping students work together in virtual environments. For instance, generative AI tools can create simulations or scenarios for students to solve as a group, encouraging teamwork. AI can also assist in tracking group progress and suggesting collaborative resources based on students' work.

Tutoring and Homework

Gen AI-powered tools can act as tutors to help students solve difficult problems in subjects like math, science, or languages, providing step-by-step explanations or helping them with complex concepts.

Writing Assistance:

Gen AI tools, like text generation models, help students to write essays, research papers, and reports. These tools can assist with brainstorming ideas, organizing thoughts, drafting content, and even editing for grammar and style.

Summarization and Paraphrasing

Generative AI can be used to summarize long academic texts or research articles, helping students quickly understand key points. It can also paraphrase content to help students learn to express ideas in their own words.

Promises of Generative AI in the Teaching and Learning

Generative AI holds significant promises in transforming teaching and learning in the classroom environment.

Adaptive Learning

Gen (AI) systems can analyse students' progress in real-time and adjust difficulty levels, pace, and content to match their proficiency, promoting a more personalized and effective learning experience.

Interactive Learning

Generative AI is just facilitating interactive and immersive learning experiences, like virtual tutors, gamified learning platforms, or AI-generated simulations that keep students engaged and motivated.

Figure 2 Picture showing the Gen. AI facilitating interactive and immersive learning experiences

Assistive Technologies

Generative AI tools can support students with disabilities, such as generating audio for visually impaired students or offering real-time speech-to-text translation for those with hearing impairments.

Lifelong Learning

Gen (AI) can support continuous learning by offering resources and personalized guidance, making it easier for individuals to pursue learning throughout their careers.

Improving Teacher Effectiveness

Generative AI can help teachers by offering professional development content and resources, keeping them updated on best practices, teaching methods, and subject knowledge. It can also access automating

administrative tasks like grading, report generation, and resource creation, AI allows educators to focus more on teaching.

Real-Time Collaboration

Generative AI supports Global classrooms, Itcan assist in creating collaborative learning experiences across different geographical locations, helping students from different parts of the world work together, exchange ideas, and learn from each other.

Major Challenges of implementing Generative AI in Teaching and Learning

While generative AI brings numerous benefits, its integration in education comes with challenges. Ethical Concerns is the majorensuring that AI-generated content is unbiased, accurate, and fair is crucial.Teachers must receive adequate training to effectively integrate AI tools into their practices.There's a risk that students might become overly dependent on AI tools and miss out on developing critical thinking and problem-solving skills.Most educational institutions find it challenging to adapt to the digital infrastructure needed to empower generative AI models in computationally intensive tasks.AI may lack the ability to understand the broader context of a student's situation which human teachers are better equipped to handle.

Benefits of Generative AI in Education.

Generative AI offers numerous benefits in teaching and learning, transforming how educators and students interact with content and each other.

Individualized Instruction: Generative AI can adapt materials to suit individual student needs, offering personalized learning experiences. This includes tailored lesson plans, exercises, and resources that target specific learning styles, strengths, and weaknesses. It can also adjust the pace of learning to match each student's speed, offering more support for those struggling and challenging those who are excelling.

Automated Content Creation: Teachers can use AI to generate lesson plans, quizzes, and assignments based on curriculum guidelines, saving time and providing fresh content.For example, AI tools can generate questions, summaries, or explanations of topics based on specific learning goals.

Enhancing Student Engagement: Gen (AI) - powered tools can create interactive simulations, virtual environments, and gamified learning experiences, engaging students in more immersive and hands-on ways.Students can receive immediate, real-time feedback on assignments, helping them learn more effectively by identifying mistakes and providing suggestions for improvement.

Support for Diverse Learners: GenerativeAI can translate materials into different languages, supporting non-native speakers or students in multilingual classrooms. It also can create accessible formats for students with disabilities, such as audio descriptions for the visually impaired or text-to-speech for students with reading difficulties.

Improved Efficiency for Teachers: Routine tasks such as grading, generating reports, and administrative work can be automated, allowing teachers to focus more on teaching and less on administrative duties.AI can also analyse student performance and provide educators with detailed reports and insights, enabling them to make more informed decisions about instruction and intervention strategies.

Conclusion

Generative AI in teaching and learning can enhance personalization, efficiency, and accessibility, making education more

adaptable and engaging for both teachers and students. AI can create a more dynamic, engaging, and accessible education system.Lastly, the future trajectory of GenAI in education is envisioned with cautious optimism. There is a strong sense that as educators and learners become more familiar with GenAI technologies, their integration into educational systems will continue to evolve. The potential for GenAI to transform educational access and effectiveness globally is recognized.

Ethical Approval

No ethical approval was necessary for this study.

Author Contribution

All authors made substantial contributions to the conception, design, acquisition, analysis, or interpretation of data for the work. They were involved in drafting the manuscript or revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work, ensuring its accuracy and integrity.

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REFERENCES

[1] Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, 2(3), 431-440.

[2] B. Ram, P. Verma(2023) Artificial intelligence AI-based chatbot study of ChatGPT, Google AI bard and baidu AI, *World Journal of Advanced Engineering Technology and Sciences,* 8 (1) (2023), pp. 258-261.

[3] Bearman.M. J. Ryan, R. Ajjawi(2023) Discourses of artificial intelligence in higher education: A critical literature review, Higher Education, 86 (2023), pp. 369-385.

[4] Bozkurt. A., 2023Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift, *Asian Journal of Distance Education,* 18 (1) (2023), pp. 198-204.

[5] Das, S. R., & JV, M. (2024). Perceptions of higher education students towards ChatGPT usage. *International Journal of Technology in Education (IJTE),* 7(1), 86-106.

[6] Giannakos, M., Azevedo, R., Brusilovsky, P., Cukurova, M., Dimitriadis, Y., Hernandez-Leo, Rienties, B. (2024). The promise and challenges of generative AI in education. *Behaviour & Information Technology*, 1–27.

[7] Murugesan.S, A.K. Cherukuri(2023) The rise of generative artificial intelligence and its impact on education: The promises and perils. *Computer,* 56 (5) (2023), pp. 116-121.

[8] Noroozi, O., Soleimani, S., Farrokhnia, M., &Banihashem, S.K. (2024). Generative AI in education: Pedagogical, theoretical, and methodological perspectives. *International*

Journal of Technology in Education (IJTE), 7(3), 373-385.

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