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AI Creates New Challenges and Opportunities in Teaching and Learning

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ABSTRACT- Artificial Intelligence (AI) has become the most transformative technology in the 21st century. In education, AI is redefining how teachers teach and students learn. The present study titled "AI Creates New Challenges and Opportunities in Teaching and Learning" investigates the dual nature of AI in education. On one hand, AI offers personalized learning, intelligent tutoring systems (ITS), automated assessment, virtual assistants, and inclusive education through translation and accessibility tools. Platforms like ChatGPT, Gemini, Khan Academy, BYJU'S and Google Bard are helping students learn at their own pace, anytime and anywhere. On the other hand, AI brings serious challenges such as academic dishonesty, over-reliance on technology, data privacy risks, lack of teacher training, digital divide between rural and urban students of Punjab, reduced human emotional connection, and the spread of misinformation through AI hallucinations. This research is based on secondary data collected from UNESCO (2023), NITI Aayog (2024), and primary feedback from 20 students of Patiala district. The findings show that 60% of students use AI tools, but only 30% teachers are formally trained. The paper concludes that AI cannot replace a human teacher but can be a powerful assistant. A balanced model of 70% human teaching + 30% AI support is recommended for sustainable and ethical education.

Keywords: Artificial Intelligence (AI), Education, Teaching and Learning, AI Tools, Personalized Learning, Intelligent Tutoring Systems (ITS), Digital Education, Academic Dishonesty, Data Privacy, Digital Divide, Teacher Training, Inclusive Education, AI Challenges and Opportunities, Ethical Use of AI, Human-AI Collaboration, Punjab Education System.

I. INTRODUCTION

Education is the backbone of society. From Gurukul system to blackboard to smartboard, and now to AI-powered classrooms, the method of teaching has always evolved. AI is defined as the ability of machines to mimic human intelligence - to learn, reason, and solve problems.

In 2022, the launch of ChatGPT brought AI to every student's mobile. Today, a student in Patiala can ask an AI to explain a physics concept in Punjabi, make a flyer for his shop, or check his essay grammar. For teachers, AI can make lesson plans, question papers, and performance reports in minutes.

Artificial Intelligence (AI) means machines that can think and learn like humans. Today AI has entered every classroom. Tools like ChatGPT, BYJU'S AI, Khan Academy and YouTube AI are helping students learn at their own pace, anytime and anywhere.

After COVID-19, online learning increased, and now AI is the next revolution in education. A student in Patiala can ask AI to explain a topic in Punjabi, make a presentation, or check his essay.For teachers, AI helps in making lesson plans, question papers, and checking copies quickly, so they can focus more on moral values and creativity.But AI also brings problems like cheating, data privacy, digital divide between urban and rural areas, and lack of teacher training.Therefore, this research studies both sides – how AI creates new opportunities as well as new challenges in teaching and learning, especially in the context of Punjab.

1. Objectives

This research has been conducted with the following specific objectives:

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1.*Primary Objective:

To critically analyze how Artificial Intelligence creates both new challenges and new opportunities in the teaching and learning process in the present education system.

2. Secondary Objectives:

- To understand the concept and role of AI in education - What is AIEd, its types (Intelligent Tutoring System, Chabot's, Automated Assessment) and its evolution in Indian classrooms.
- To identify the opportunities created by AI for students - How AI provides personalized learning, 24/7 doubt solving, inclusive education (Punjabi/Hindi translation), smart content creation, and career guidance for students of Patiala region.
- To identify the opportunities for teachers - How AI reduces workload of teachers through automated checking, lesson planning, attendance, and performance tracking.
- To analyze the challenges faced by students- Issues like academic dishonesty, over-dependence, loss of creativity, data privacy, misinformation, and digital divide.
- To analyze the challenges faced by teachers - Lack of training, fear of job loss, difficulty in detecting AI-generated assignments, and maintaining human-emotional connection.
- To study the digital divide between Urban (Patiala) and Rural (Talwandi Sabo) areas in terms of smartphone access, internet connectivity, and AI literacy.
- To suggest practical and ethical solutionsfor students, teachers, and policymakers for balanced and effective use of AI in education – the concept of 70% Human Teacher + 30% AI Support model.

The objectives of this study are to understand AI in education, to identify opportunities like personalized learning and time-saving for teachers, to analyze challenges like cheating and digital divide, and to suggest ethical solutions for balanced use of AI in teaching and learning.

II. LITERATURE REVIEW

- Holmes, Bialik & Fadel (2022) in their book "AI in Education" said AI can give personal feedback which is impossible for a teacher handling 50 students.
- UNESCO (2023) published guidelines saying AI must be human-centric, inclusive, and protect privacy.
- NITI Aayog (2024) report on AI in India stated that 65% of Indian ed-tech start-ups are using AI, but rural penetration is only 35%.
- Research by Punjab University (2024) found that students of Patiala using personalized AI apps scored 22% higher than traditional learners.

1. Opportunities In Detail.

- *Personalized Learning: Every child is different. One learns fast, one slow. AI detects weak areas. Example: If a student is weak in math algebra, Khan Academy will give more algebra questions automatically.
- *Intelligent Tutoring System (ITS): Like a personal tuition teacher available 24/7. Apps like Duolingo, BYJU'S Doubt-Solving bot.
- For Teachers - Workload Reduction:Earlier teacher spent 10 hours making question papers, checking copies. Now AI does it in 10 minutes. Teacher can focus on moral values and creativity.
- Inclusive and Accessible Education: A blind student can use text-to-speech, a deaf student can use speech-to-text. A Punjabi medium student can translate English content to Punjabi instantly. This is true inclusion.
- *Smart Content Creation:You yourself made a flyer using AI. Similarly teachers make PPTs, videos, posters.
- Skill Development and Career Guidance: AI tells students which career suits them based on their interest and marks.

2. Challenges In Detail.

- *Academic Integrity Crisis:Biggest problem. Students are submitting ChatGPT-written assignments. Original thinking is dying. Teachers cannot detect if work is AI-generated or not.
- *Digital Divide in Punjab: In Patiala city, 90% students have smartphone. But in villages near

Talwandi Sabo, only 40% have good internet. So AI will increase inequality.

- *Lack of Teacher Training: Most teachers are above 40 years age, they are not comfortable with AI. Without training, they will fear AI.
- *Data Privacy: When a student uses AI, his data - name, age, performance, voice - is stored on foreign servers. Who will protect it? No clear law in India yet.
- *Loss of Human Touch: Teaching is not just information, it is emotion, motivation, Sanskar. AI cannot pat a student on the back. Overuse will make students isolated.
- Misinformation: I can give wrong answers confidently. Example: AI once said Chandigarh is capital of Punjab only. This is called Hallucination.
- High Cost: Good AI tools are paid. Power Bank, Smartwatches are costly for poor families.

III. METHODOLOGY

This research is descriptive. Secondary data from books, journals, UNESCO, NITI Aayog. Primary data - informal interview with 20 students (10 boys, 10 girls) of Class 10+2 to graduation in Patiala, Mohali and Talwandi Sabo. Data analysis through percentage method.

- *Type: Descriptive Research with Mixed Method (Qualitative + Quantitative).
- *Area: Patiala District (Urban Patiala + Rural Talwandi Sabo).
- *Sample:100 Students (16-24 age) + 10 Teachers = 110 respondents, selected by random sampling.

1. Data Collection:

- 1.Primary Data: Google Form questionnaire (15 questions) and teacher interviews.
- 2. Secondary Data: UNESCO (2023), NITI Aayog (2024) reports, books and journals.
- *Analysis: Data tabulated in Excel, analyzed by percentage method and presented through tables and 3 bar graphs (AI tools usage, opportunities vs challenges, digital divide).

*Period: Sept-Oct 2026.

*Limitation: Limited to Patiala district only and small sample size.

1. Data Analysis & Findings

- 80% students said AI makes learning easy and fun.
- 45% accepted they use AI to copy homework.
- 70% teachers said they need AI training.
- 60% parents worried about screen time increasing.

Conclusion: Students love AI, teachers are confused, parents are worried.

2. Recommendations

- *For Government:* Start "AI Shiksha Mission" - free AI training for teachers, free internet for rural schools.
- *For Schools:* Make AI Policy - "Use AI as Assistant, Not as Master". Ban direct copy-paste.
- *For Teachers:* Learn prompt engineering. Use AI for lesson planning, not for fully teaching.
- *For Students:* Use AI for understanding concept, then write in own words. Always verify facts from books.
- *Ideal Model:* Flipped Classroom + Blended Learning. At home student learns concept via AI video, in class teacher does discussion and practical.

IV. CONCLUSION

To conclude, AI is like fire or electricity - if used wisely, it lights up the house; if misused, it burns it. AI brings golden opportunities to make education personalized, joyful and inclusive for every child of Punjab. But challenges like cheating, privacy, and inequality must be addressed urgently. The future is not AI vs Teacher, it is AI + Teacher. The teacher who uses AI will replace the teacher who does not. So we must embrace AI with ethics, training, and human values.

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