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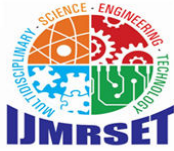
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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# Artificial Intelligence in Education: A Survey on the Use of AI Tools for Teaching and Learning

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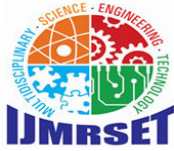
**ABSTRACT:** This paper discusses using Artificial Intelligence in education, focusing on using AI tools for teaching and learning. AI-driven technologies, including automatic assessment systems, transcription and translation technologies, educational games, and personalized learning platforms, have changed education by increasing participation, improving learning outcomes, and lessening educators' workload. It highlights how AI technologies, such as Gradescope, Grammarly, Otter.ai, and Duolingo, have changed assessment methods, offered immediate feedback, and supported variance through user-friendly features. AI-driven educational games and personalized learning platforms further adjust to the needs of each student, improving critical thinking, language learning, and mastery of difficult topics. Still, the paper further discusses the issues caused by AI in education, which include problems with teacher-student relationships, excessive dependency on technology, privacy issues, and the digital gap. The advantages and disadvantages of integrating AI in education are outlined by the perceptions of teachers as well as students. While AI offers significant potential for personalized, efficient learning experiences, it is crucial to address privacy, security, and equitable access to ensure its transformative impact on education.

**KEYWORDS:** Artificial Intelligence, Education, Teacher, AI Tools, Voice Assistant.

## I. INTRODUCTION

Artificial intelligence has completely transformed the field of education, using advancements in computing and information processing technologies. The implementation of AI in education has introduced a wide range of solutions, opportunities, and issues, greatly influencing instructional techniques in many fields. AI has become widely accepted and used in educational institutions in all aspects of learning, instruction, and administration. Educators are using the AI tools to improve the quality of instructional techniques and simplify administrative tasks. With AI-powered proposals, roles like assessing and marking learner assignments can be carried out more efficiently and promptly. Additionally, customization and the use of cognitive computing have made it simpler to customize curriculum and resources to satisfy the unique needs of learners. It has driven greater acceptance, participation, and a better learning environment for students overall. AI's impact on education exceeds standard boundaries, touching multiple aspects of instructional techniques. From customized learning experiences to effective administrative practices, AI has reshaped the way that Knowledge is shared and gained. AI has tremendous potential to drive innovation and change in the education sector as it emerges, propelling us into a new period of improved educational results and possibilities for students globally.

As the future generation of scientists, engineers, and intellectuals is moving through higher education, it requires to train for a workplace where AI might be prevalent, as well as a society that will be greatly impacted by these tools. Although AI will probably improve different educational resources and techniques, it is crucial to determine whether students find these developments useful, demanding, or perhaps even useless. Moreover, with AI potentially redefining job roles and research paradigms, evaluating students' readiness and flexibility can provide important data for educational institutions wanting to continue to be at the forefront of technology education. In addition, as AI increasingly permeates our everyday life and professional areas, it is inevitable for educational models to evolve. Artificial Intelligence has been incorporated into numerous applications that are associated to education. Some latest instructional applications are the AI platform called ChatGPT, which can produce texts on a wide range of subjects in response to user inputs; Talk to Books, which has a meticulously organized database of books that provides quotes in response to user inputs; Sheet Plus, which transforms text into a Google Sheet or Spreadsheet formulas; Bearly, which reduces long sentences; Lex, which also produces essays; Glasp, which produces highlights using human notes and



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highlights; Perplexity, which offers short replies with references; DALL-E 2, which may produce unique and realistic visualizations depending on text instructions composed of natural language; and a lot more [1].

AI has caused significant changes in education. Several studies have proven that integrating technology into education has various advantages. Modern educational technology can be a useful tool for teaching and learning in this swiftly evolving technological setting and might even fit into a comprehensive system for lifelong learning. Artificial intelligence can customize students' learning depending on the demands of each student. It can be relied on to support teaching and learning since it provides various tools and technologies. It can improve the accuracy and speed of the feedback in addition to customizing learning for every learner [2]. This uniqueness can offer students with equal opportunities to improve their learning. The main objective of this study is to investigate AI in education, particularly in the teaching and learning process.

### II. AI TOOLS IN EDUCATION

Artificial intelligence has been widely applied to various educational technology platforms as follow:

#### Voice Assistant

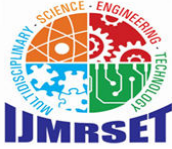
AI-based voice assistants like Siri, Alexa, Cortana, and Google Assistant are changing education by enabling interactive learning using natural language communication. They offer personalized support, simplify complex topics, and assist in language learning with real-time feedback. Such tools enhance equality by offering features such as text-to-speech and speech-to-text for students with impairments. In classrooms, they improve administrative efficiency by automating tasks like attendance and scheduling, allowing teachers to focus on teaching. Voice assistants also aid in exam preparation with quizzes and flashcards, and support collaboration by sharing notes. Through natural language processing and machine learning, these tools enhance education's accessibility, efficiency, and engagement [3]. Here are a few examples of AI-powered voice assistants designed for educational purposes is given in Table 1:

Table 1: Key Educational Goals Supported by AI-driven Voice Assistants

Tool	Description
Google Assistant	Helps with scheduling, questions, reminders and also connects with Google for Education resources.
Amazon Alexa	Improves learning using trivia games, quizzes, and integration with smart classroom.
Apple Siri	Manages educational tasks, translations, and reminders on Apple devices.
Microsoft Cortana	Integrates with Microsoft 365 for document editing, scheduling, and learning resources.
Socratic by Google	Offers interactive clarifications, videos, and answers to questions from students.
Carnegie Learning's MATHia	Helps to solve math questions step-by-step using voice commands.
Quizlet Voice AI	Offers speech interaction for learning new words and flashcard reviews.
ELSA Speak	Specializes in improving English pronunciation and fluency.
Voiceitt	Assists students with speech impairments in communication and accessing resources.
Quizbot	Conducts quizzes and reinforces learning concepts through voice interaction.

#### Virtual Mentors

AI-driven virtual mentors are changing the dynamics of learning through accessible assistance to learners that is suitable for the learner. Such mentors assess the learners' areas of strengths, weaknesses, and preferences, and present them with specific exercises and feedback to enhance learning. They are also instrumental in helping learners prepare for exams, develop skills, write essays and look for solutions to problems. They are also very good in careers, helping the students to decide what to do based on the current opportunities and which courses and certifications are needed. They do not provide education only, but also emotional support, help students to manage stress and are available all the time, so everyone is covered. By giving learners, the opportunity to monitor their improvement and progress, virtual mentors motivate learners to continue looking for chances to learn new skills [4]. Below are few examples of the virtual mentors fostered for educational purposes by AI is given in Table 2:



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Table 2: Key Educational Goals Supported by AI-driven Voice Mentors

Tool	Description
Duolingo AI Bots	Personalized language learning with interactive exercises and feedback.
TutorMe AI Tutor	On-demand tutoring with AI-generated personalized learning paths.
ALEKS	Personalized instruction in math, science, and business.
Code.org AI Assistant	Guides learners through coding exercises and challenges.
LanguageTool AI Mentor	Assists with grammar, writing style, and multilingual corrections.
Babbel AI Tutor	Offers personalized language learning based on progress.
LinkedIn Learning Coach	Recommends courses and career development paths based on goals.
Edthena AI Coach	Analyzes teaching sessions and provides actionable feedback.
Woebot	Supports mental well-being and stress management through conversational AI.
Replika	Offers emotional support and fosters conversational skills.

### Automatic Assessment System

AI based automatic assessment systems that are transforming educational evaluations by increasing accuracy, efficiency, and scalability. These systems can automatically grade an array of assignments, from multiple choices to essays to complex problem sets, delivering in-depth, impartial feedback and reducing educators' workload. They also enable adaptive testing, which varies question difficulty according to student performance, providing personalized insights about a learner's skills. AI tools monitor learning outcomes, create performance reports, and support educators in filling learning gaps. In language learning, speech recognition tools analyse pronunciation and fluency, helping learners to acquire new languages faster. These easy to scale systems for large assessments (MOOCs) are also great for accessibility since voice-based or adaptive evaluations are much easier for children with disabilities to take [5]. Here are a few examples of AI-driven automatic assessment tools designed for educational purposes is given in Table 3:

Table 3: Key Educational Goals Supported by AI-driven Automatic Assessment Tools

Tool	Description
Gradescope by Turnitin	Automates grading for assignments and exams, including handwritten responses.
Turnitin Revision Assistant	Evaluates essays for grammar, structure, and originality, offering actionable feedback.
Grammarly for Education	Assesses writing for grammar, punctuation, and clarity, suggesting improvements.
WriteLab	Analyzes essays and provides personalized improvement suggestions.
Duolingo English Test	AI-driven proficiency test with instant scoring for grammar, listening, and speaking skills.
SpeechAce	Assesses spoken language proficiency with AI, focusing on pronunciation and fluency.
Pearson MyLab	AI-driven assessments for subjects like math, business, and science.
Codility	Automatic assessment for coding challenges and programming skills.
Moodle with AI Plugins	Automates grading and feedback for quizzes, assignments, and forums.
ProctorU Auto	AI-enabled exam monitoring and automatic scoring for online tests.

### Automated Transcription and Translation

Automated transcription and translation technologies driven by AI are making education more accessible by eliminating barriers to communication. These tools provide real-time transcription of lectures and discussions and they are helpful for students with hearing impairment and may also help others understand better. AI translation tools, such as Google Translate, or even apps like DeepL can help make educational content available in multiple languages — making it more inclusive and catering to international students of any nation. They also help promote widespread collaboration by overcoming language barriers in diverse educational settings, such as MOOCs. AI transcription and



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translation also aid content archiving and access to materials. These tools also enhance student engagement, participation and personalized learning by allowing students to view content at their pace [6]. Here are a few examples of AI-driven automated transcription and translation tools that are commonly used in educational settings is given in Table 4:

Table 4: Key Educational Goals Supported by AI-driven Transcription and Translation Tools

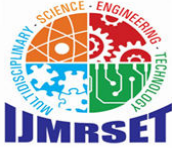
Tool	Description
Otter.ai	Real-time transcription for meetings and lectures with keyword search and speaker identification.
Rev	AI and human-edited transcription for lectures and seminars with high accuracy.
Sonix	Converts audio and video files into text, supporting various formats.
Descript	Automatic transcription with editing tools and caption generation.
Trint	Transcribing using AI with a user-friendly editing and search interface.
Temi	High-accuracy transcription with time stamps and export options.
Google Translate	AI-driven translation in more than 100 languages for text, documents, and webpages.
DeepL	Excellent translations that sound natural, perfect for challenging instructional materials.
iTranslate	Translation of text and voice for real-time communication and instructional materials.
Amazon Translate	Real-time translation of course materials using cloud-based translation.

### Educational Games

Artificial intelligence based educational games changes the way of learning by providing personalized and interactive experience customized to each student's capabilities. These games modify difficulty and content to maintain the attention and motivation of students, and prompt them with real-time feedback to promote their skills. It fosters critical thinking and problem-solving by providing interactive scenarios that extend beyond learning traditional concepts. Features of Gamification like rewards and achievements create an enjoyment while fostering healthy competition. Additionally, AI facilitates social-emotional learning (SEL) by mimicking real-life situations and enables collaborative learning through multiplayer games that improve social interaction and teamwork. AI-powered games in the language learning space enhance vocabulary, grammar, and pronunciation through speech recognition and personalized feedback. On the whole, these enhance the enjoyment, interaction, and progression of schooling [7]. Here are a few examples of AI-driven educational games designed for various educational purposes is given in Table 5:

Table 5: Key Educational Goals Supported by AI-driven Educational Games

Platform	Description
Kahoot	Platform which monitors progress and creates customized learning experiences via quizzes.
Zoombinis	Logic and problem-solving game adapting challenges based on progress.
CodeCombat	Game teaching coding by adapting complexity to the player's skills.
Classcraft	Role-playing game tracking progress, providing real-time feedback, and gamifying learning with rewards.
Quizlet Live	Collaborative learning game reinforcing knowledge through real-time adaptive gamification.
Duolingo	AI-powered app for language learning with interactive exercises and adaptive lessons.
Babbel	Personalizes lessons with real-time feedback on pronunciation, grammar, and vocabulary.
Lingvist	Customizes language exercises based on progress, focusing on vocabulary and grammar mastery.
Tynker	Coding platform with AI-driven games adapting lessons to pace and abilities.
Kodable	Introduces coding to young learners with AI-adapted challenges.



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### Personalized Learning

AI-enabled personalized learning is transforming education by changing the educational journey to each student's needs, preferences, and pace. Artificial Intelligence uses adaptive learning to adjust the difficulty level and content based on performance, focusing on the weak areas to be worked upon; while challenging the student in the strength areas. This bolsters confidence and mastery. It offers real-time feedback, monitors progress, and supports a variety of learning formats to suit diverse styles, making the process more engaging and better for retention. It also develops personalized curricula based on students' interests and objectives, helping keep them engaged and take ownership of their education. Moreover, AI provides step by step guidance for various complex topics, encourages holistic learning through extra-curricular recommendations and improves language learning. On the whole, AI-based personalized learning is a fun and impactful educational experience [8]. Here are a few examples of AI-driven personalized learning designed for various educational purposes is given in Table 6:

Table 6: Key Educational Goals Supported by AI-driven Personalized Learning

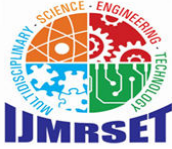
Platform	Description
Squirrel AI	Offers personalized learning in subjects like math and English by customizing lessons to student performance and learning styles.
Smart Sparrow	A STEM learning platform that adapts to student progress by changing content and pace.
Khan Academy	Uses adaptive learning features to tailor lessons, track progress, and highlight areas for improvement via a personalized dashboard.
Coursera	Offers AI-based personalized course recommendations and adjusts learning experiences to learner interests and progress.
CogBooks	Provides adaptive content and real-time analytics to enhance student engagement and retention.
Learnosity	Customizes assessments and content to current student abilities, helping educators monitor performance effectively.
Lumen Learning	Uses AI-driven adaptive tools to personalize content delivery and improve student engagement and success.
Pathbrite	AI-powered digital portfolio platform that tracks learning progress and offers insights into educational journeys.

### III. TEACHER AND STUDENT PERSPECTIVES ON THE ROLE OF AI IN EDUCATION

There have been a lot of discussions on the prospective benefits and challenges of integrating AI into education. As AI continues to evolve, it offers many benefits, including enhancing personalized learning experiences, increasing the efficiency of administration, and providing real-time data for educators [9]. These advantages have become ever more evident in classrooms all over the world as AI tools are used to enhance the teaching and learning process. However, there are disadvantages to using AI in education, just like with any new technology. Concerns related to privacy, data security, teacher-student interactions, and the risk of dependence on automated systems are some of the challenges that need to be addressed. This section delves into the various advantages and disadvantages of using AI in education, offering insights into how AI is perceived by both teachers and students and its overall impact on the educational experience [10].

#### Advantages of AI in Teachers' Perception:

- AI customizes content to individual student needs, enhancing engagement and learning outcomes.
- Simplifies repeated tasks, freeing up time for teaching.
- Offers useful data on student performance, help with prepare revisions.
- Gamified learning environments improve student motivation and participation.
- AI supports various learning difficulties, including language barriers and disabilities.
- Virtual tutors offer support beyond classroom hours.
- AI recommends resources for teachers to improve skills and methods.



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### Disadvantages of AI in Teachers' Perception:

- AI may reduce personal teacher-student relationships, impacting emotional support.
- Over-reliance on AI could weaken teaching abilities.
- Teachers may struggle to manage large amounts of AI-generated data.
- AI algorithms might reinforce biases or provide inaccurate assessments.
- Concerns about AI replacing teachers or diminishing their role.
- AI cannot address emotional needs or provide empathy.
- Privacy and security concerns regarding student data.
- Technical issues and unequal access can hinder AI's effectiveness.

### Advantages of AI in Students' Perception:

- AI customizes lessons to suit individual learning styles, boosting engagement and performance.
- Provides instant feedback on assignments, speeding up learning.
- Virtual tutors and language assistants are available 24/7.
- AI adjusts task difficulty to ensure an appropriate challenge.
- AI supports students with disabilities through voice recognition and text-to-speech tools.
- Gamified learning experiences make studying enjoyable.

### Disadvantages of AI in Students' Perception:

- AI may reduce face-to-face interaction with teachers, affecting social learning.
- Over-dependence on AI can hinder the development of critical thinking and problem-solving skills.
- Data privacy and security concerns with the collection of personal and academic data.
- AI lacks empathy, affecting emotional and motivational support.
- AI algorithms may present biased or inaccurate assessments.
- Unequal access to AI technologies creates a digital divide [11].

## IV. CONCLUSION

Artificial Intelligence is playing a vital role in transforming the traditional mode of teaching and making it smarter, more efficient, personalized, and accessible for everyone. AI-powered virtual mentors, voice assistants, automatic assessment tools and educational games enhance student engagement, and help reduce teachers' workloads. But there are challenges that remain, including the loss of emotional connection between teachers and students, so much dependence on technology that it becomes counterproductive, as well some data privacy issues such as fairness in assessments and access gaps; not all learners will have equal opportunity to use technology if every school uses it. However, to make sure that AI is not used for the wrong things and it is going to impact education positively, we need to solve these concerns and educators have to work with students, policymakers, developers so there will be collaboration on problems which need solving by both humans and AIs while creating models of practice that complement rather than replace learning experiences.

## REFERENCES

- [1] S. Wang, F. Wang, Z. Zhu, J. Wang, T. Tran, Z. Du, "Artificial Intelligence in Education: A Systematic Literature Review", *Expert Systems with Applications*, 252 (2024), 124167, 2024.
- [2] A. Gocen, F. Aydemir, "Artificial Intelligence in Education and Schools", *Research on Education and Media*, ISSN: 2037-0830, 12-1, 2020.
- [3] S.J. Koli, "Artificial Intelligence in Voice Assistant", *International Journal of Advances in Engineering and Management*, ISSN: 2395-5252, Vol. 2, Issue 9, pp. 759-762, 2020.
- [4] T.N. Fitria, "Artificial Intelligence (AI) in Education: Using AI tools for Teaching and Learning Process", *Proceeding Seminar National & Call for Papers*, ISSN: 2654-6590, 134-147, 2021.
- [5] L. Chen, P. Chen, Z. Lin, "Artificial Intelligence in Education: A Review", *IEEE Access*, Vol. 8, pp. 75264-75278, 2020.



## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

- [6] V. J. Owan, K. B. Abang, D. O. Idika, E. O. Etta, B. A. Bassey, "Exploring the potential of artificial intelligence tools in educational measurement and assessment", EURASIA Journal of Mathematics, Science and Technology Education, ISSN:1305-8223, 19(8), 2023.
- [7] V. Prakash, S. Jasta, "Artificial Intelligence Tools in Education (AIED): Advancements, Implementation, and Challenges", International Journal of Creative Research Thoughts, ISSN: 2320-2882, Vol. 11, Issue 5, pp-i114-i120.
- [8] J.V. Garrel, J. Mayer, "Artificial Intelligence in studies - use of ChatGPT and AI-based tools among students in Germany", Humanities & Social Sciences Communications, 10:799, 2023.
- [9] B. A. Chaudhari, P. Lahane, P. Shejwal, S. Hadke, P. Rakibe, T. Kute, "A Survey paper on role of Artificial Intelligence in Education", International Journal of Engineering Technology and Management Sciences, ISSN: 2581-4621, Vol. 8, Issue. 4, pp. 175-184, 2024.
- [10] E. Sharma, V. Mehta, A. Pahuja, "AI Tools in Education: Perspectives from Learners and Educator", International Journal of Creative Research Thoughts, ISSN: 2320-2882, Vol. 12, Issue. 2, pp. f295-f310, 2024.
- [11] T. K. A. Ebuena, "Perception of Teachers and Students on the use of Artificial Intelligence (AI) Tools in Education", International Journal of Innovative Science and Research Technology, ISSN No: 2456-2165, Vol. 8, Issue. 6, pp. 1400-1403, 2023.





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