



Artificial Intelligence and its Applications in Education

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Outline

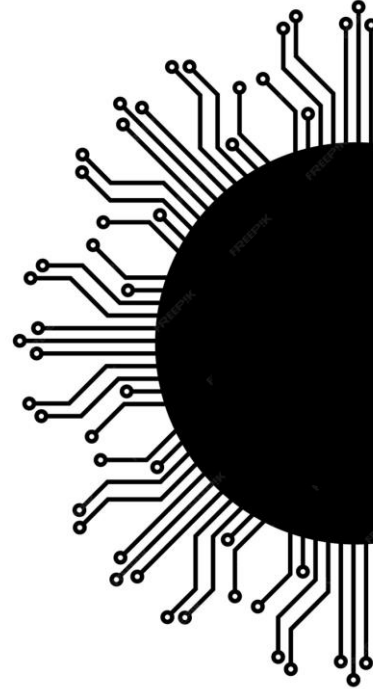
Introduction

1. Artificial Intelligence
2. AI in Education
3. Collaboration between Humans and AI
4. The Future of AI in Education

Conclusion



Introduction



Introduction



**“Education is the
most powerful
weapon which you
can use to change
the world.”**

1918 - 2013

Introduction





Introduction

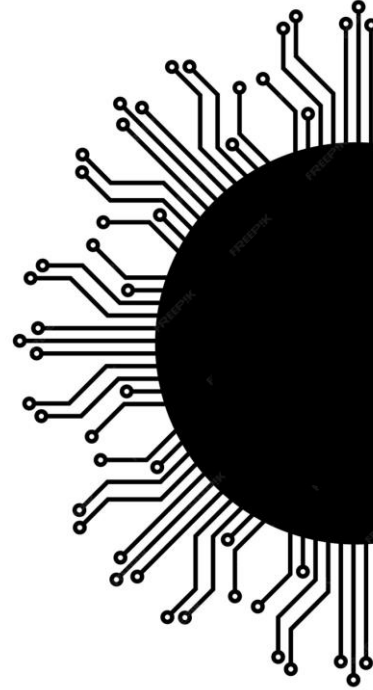
4 QUALITY
EDUCATION



Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



Artificial Intelligence

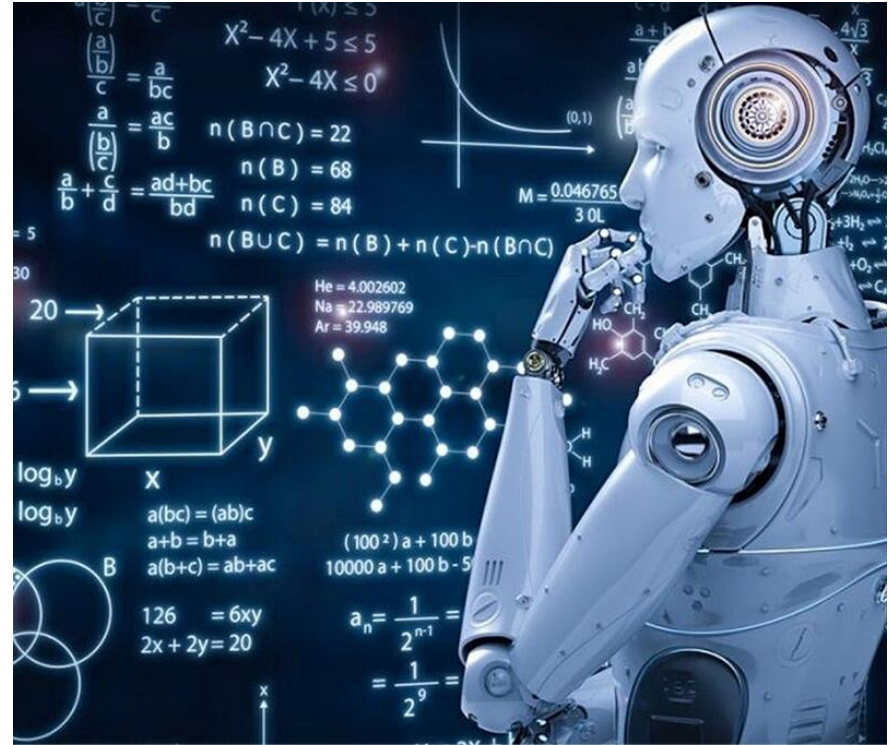




Definition

« *The science and engineering of making intelligent machines* »

John McCarthy (1956)



Key dates and periods 1/2



1943



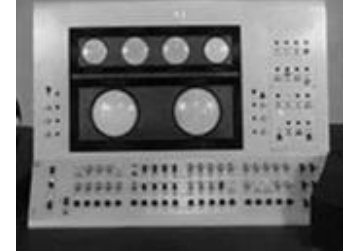
Warren McCulloch and Walter Pitts introduced the binary McCulloch-Pitts neuron, a foundational concept for artificial neural networks in AI.

1950



Alan Turing's 'Computing Machinery and Intelligence' introduces the Turing Test, a key concept in AI development.

1951



Ferranti Mark 1, the world's first commercially available computer, is put into operation, laying the groundwork for future AI research.

1956

Dartmouth Workshop led by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon marking the birth of AI as an academic field.





Key dates and periods 2/2

1957



Frank Rosenblatt introduces the concept of perceptrons, a foundational element in neural network-based AI.

1965



Joseph Weizenbaum creates ELIZA, an early natural language processing program.

1967



Richard Greenblatt, inventor of the LISP programming language, developed a chess-playing program, 'Mac Hack VI,' capable of competing with human players in chess tournaments.

1969

Marvin Minsky and Seymour Papert, in their book 'Perceptrons,' demonstrated the limitations of neural networks, particularly their inability to handle non-linearly separable problems. This led to reduced funding for research in this field.





First AI Winter (1970s to mid-1980s)

- **Definition:** Period of reduced funding and interest in AI research.
- **Causes:**
 - Overinflated expectations.
 - Limited computing power.
 - Lack of significant progress.
- **Impact:**
 - Slowdown in AI research.
 - Loss of talent from the field.
- **Recovery:**
 - Followed by an AI "Spring" with renewed interest and advancements.



Credit: [Depositphotos](#)



Second AI Winter (Late 1980s to early 1990s)

- **Definition:** A subsequent period of AI research decline.
- **Causes:**
 - Perception of AI as failing to deliver.
 - Limitations of AI technologies, especially expert systems.
- **Impact:**
 - Decreased funding and skepticism.
 - Stagnation in AI research.
- **Recovery:**
 - Followed by renewed interest, leading to further AI advancements.



Credit: [Depositphotos](#)



Key dates and periods

2000



Cynthia Breazeal creates the first emotion-expressing robotic head.

2009



Google unveils self-driving car project, a milestone in autonomous vehicles' development, empowered by AI and machine learning.

2011



IBM's Watson winning 'Jeopardy!' demonstrated significant progress in natural language understanding and complex question answering, while Apple introduced Siri, a widely adopted consumer AI application using natural language processing and voice recognition.

2012



Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton published their results on image classification using convolutional neural networks on the ImageNet database. Simultaneously, the Google Brain team developed a neural network capable of recognizing cats in YouTube videos, signifying substantial advancements in computer vision and machine learning.



Key dates and periods

2014



In 2014, Facebook's teams developed 'DeepFace,' achieving facial recognition with a mere 3% error rate, signifying a major advancement in facial recognition technology and deep learning.

2016



DeepMind's AlphaGo's victory over world Go champion Lee Sedol marked a significant AI milestone, demonstrating its prowess in mastering complex board games through deep reinforcement learning.

2017



DeepMind's AlphaGo defeated world Go champion Ke Jie with a score of 3-0, showcasing AI's remarkable proficiency in the complex game of Go.

2019

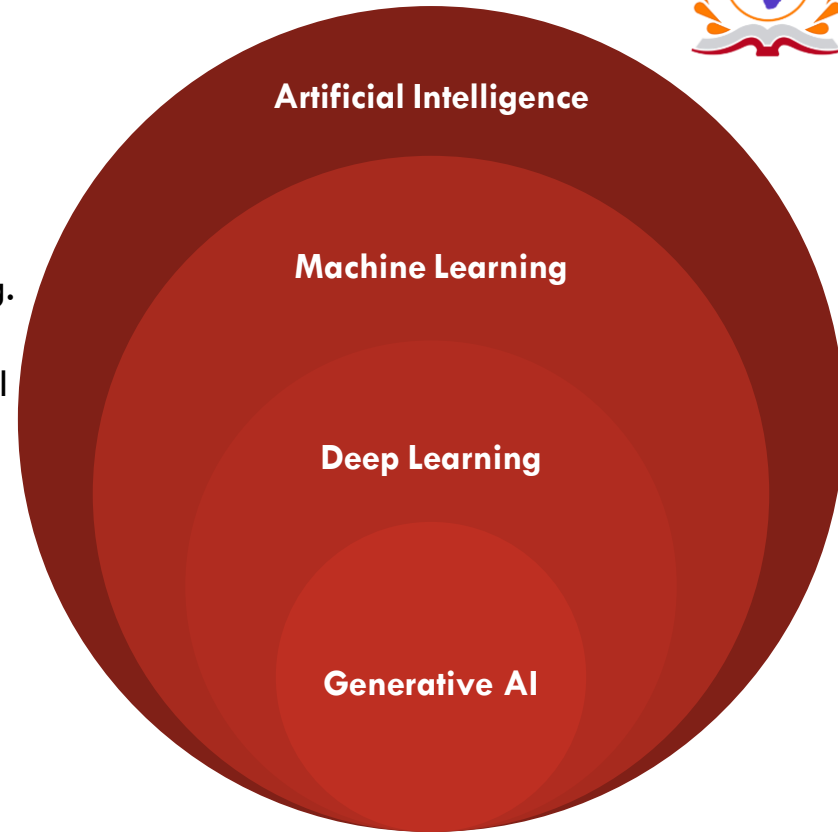


OpenAI released GPT-2, a groundbreaking language model, while AI ethics and regulation discussions gained prominence, and AI applications in healthcare diagnostics continued to advance.



AI and its Subsets

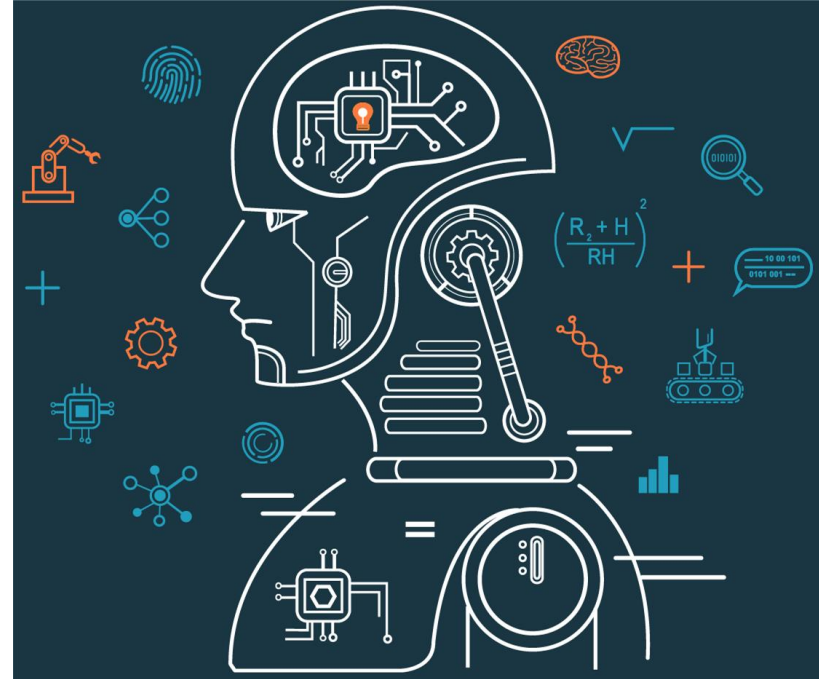
- **Artificial Intelligence:** Programs with the ability to mimic human behaviour.
- **Machine Learning:** The ability for computers to learn from experience or data without human programming.
- **Deep Learning:** Mimics the human brain using artificial neural networks such as transformers to allow computers to perform complex tasks.
- **Generative AI:** Generates new text, audio, image, video or code based on content it has been pre-trained on.





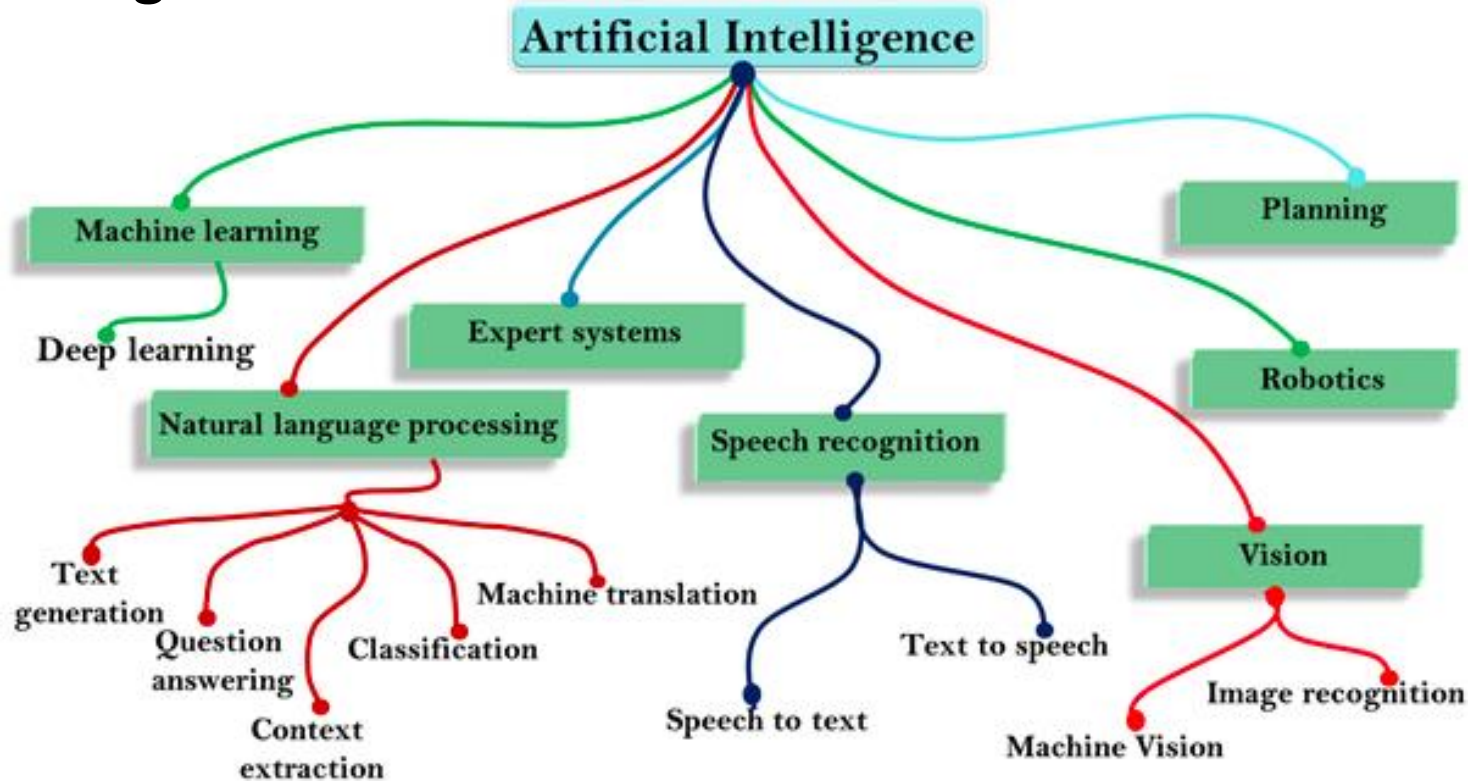
Different types of learning

- Supervised Learning :
Task driven (Regression / Classification)
- Unsupervised Learning :
Data driven (clustering)
- Reinforcement Learning :
Algorithm learns to react to an environment





AI technologies





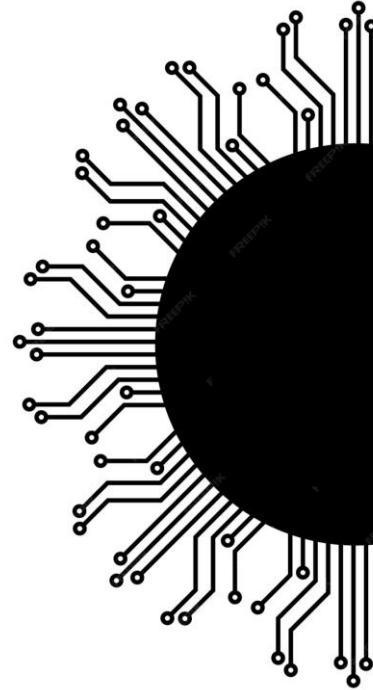
Global AI applications

- Healthcare
- Education
- Finance
- Retail
- Transportation and automation
- Agriculture
- Energy
- Environment
- Manufacturing, etc.





AI in education





Examples of AI in Education



Translation &
Language
Learning



Writing



Early Childhood
Education



Teaching



Tutoring



Use of AI in Education

- Immediate attention, Feedback to Teachers
- Better Assessment of Skills & Weaknesses
- Smart content for everyone
- Tutor and Guidance Outside the Classroom
- Automate Admin Tasks
- Customized Learning Plan



Early childhood education



AI-driven tools provide adaptive learning activities and personalized resources, enhancing engagement and tailoring education to each child's unique needs.

However, it's crucial to strike a balance between technology and human interaction for holistic and balanced development in young children. Thoughtful integration of AI in early childhood education can create new opportunities for children to acquire essential skills and explore their surroundings.



AI in special education

AI supports special education with personalized interventions, adaptive learning materials, and inclusive environments, ensuring equal opportunities for all.





Role of AI in personalized learning

AI personalizes learning by analyzing student data, tailoring learning paths, suggesting resources, and providing targeted feedback, promoting individualized learning and academic success.





Automating administrative tasks



AI automates administrative tasks in education, such as grading, scheduling, and record-keeping. This frees up teachers to focus on instruction and student engagement, reduces errors, and improves efficiency in educational institutions.



Teaching

Here are some real-world case studies of educational institutions and platforms that have successfully integrated AI into teaching methods:



- Duolingo
- Coursera
- DreamBox
- Knewton
- Squirrel AI
- Quillionz
- TutorMate

coursera





Enhancing teaching practices



AI aids teachers in improving their teaching methods through data analysis, real-time feedback, and effective strategies, leading to enhanced student engagement.



Online learning



canvas



Blackboard

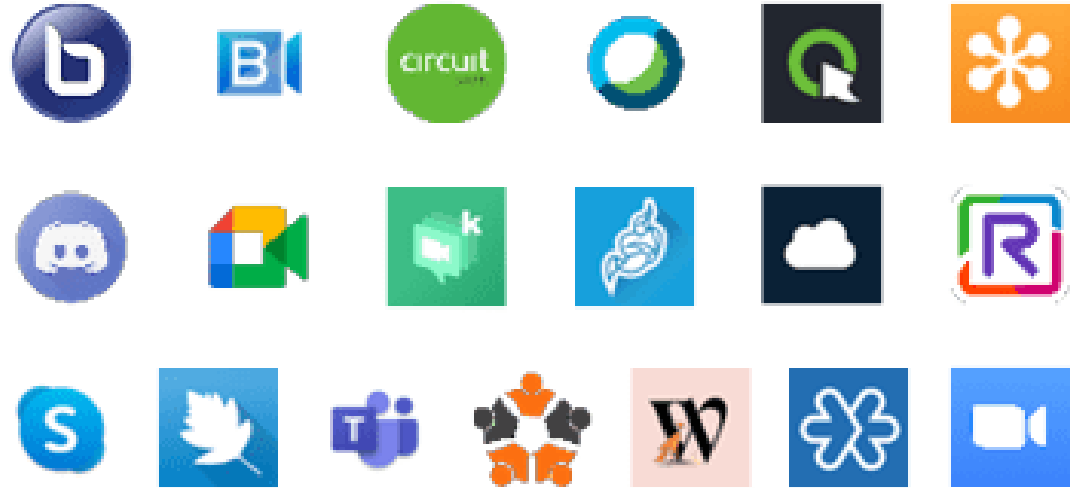
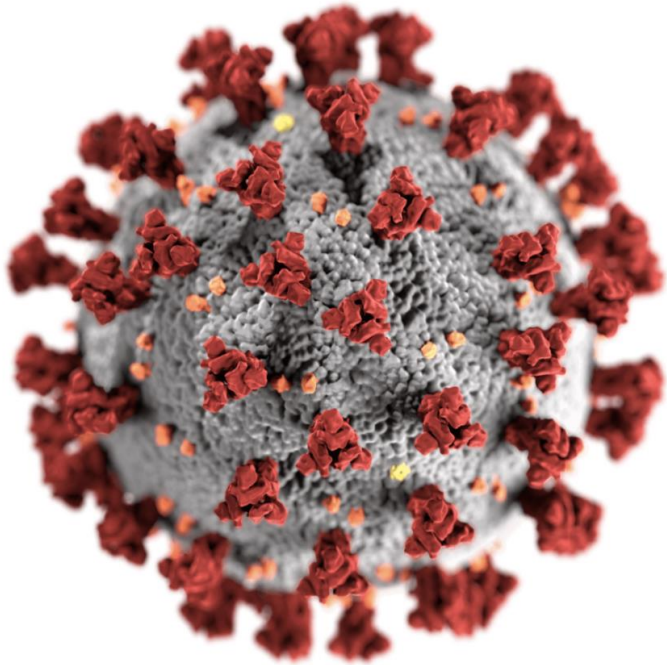


forma.lms





Visioconference tools





Assessment

Integration of artificial intelligence has allowed a rethinking of how student performance is assessed, offering benefits such as automation, personalization, and informative data.





Adaptive assessment

AI facilitates adaptive assessments, dynamically adjusting difficulty and content based on real-time responses, providing instant feedback and supporting student learning and growth.



Writing 1/2



01	Grammar and Spelling Correction	<ul style="list-style-type: none">• Grammarly• ProWritingAid• Hemingway Editor• Ginger Software• WhiteSmoke
02	Style and Tone Suggestions	<ul style="list-style-type: none">• StyleWriter• Slick Write• WordRake• Sapling AI
03	Plagiarism Detection	<ul style="list-style-type: none">• Turnitin• Copyscape• Plagscan• Unicheck• Grammarly (for plagiarism detection)
04	Writing Enhancement Tools	<ul style="list-style-type: none">• Hemingway Editor• ProWritingAid• Autocrit• Reedsy

Writing 2/2

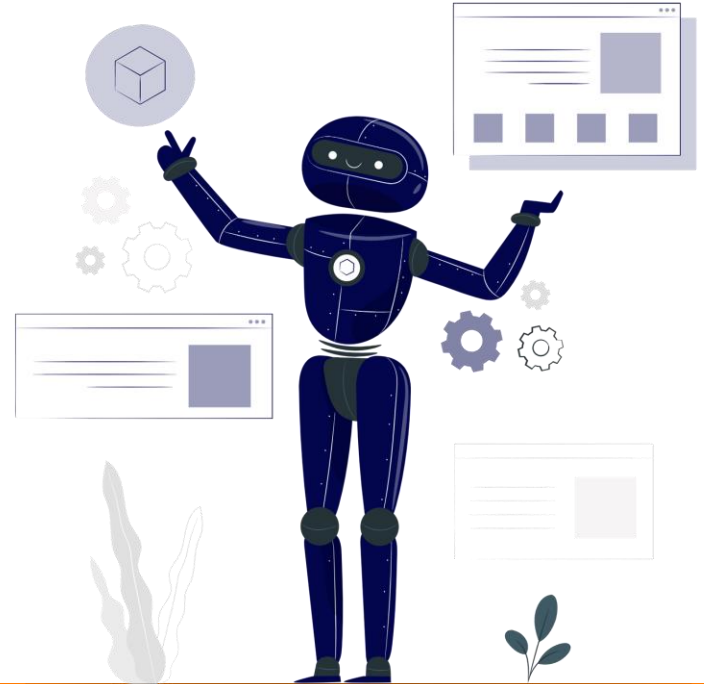


05	Personalized Writing Support	<ul style="list-style-type: none">• Writessay• Viable• Text Blaze• Prompt
06	Natural Language Generation	<ul style="list-style-type: none">• GPT-3 (OpenAI)• BERT (Google)• NLG platforms like Narrativa and Articoolo• Wordsmith (Automated Insights)• ChatGPT (OpenAI)
07	AI in Creative Writing	<ul style="list-style-type: none">• AI Dungeon• ChatGPT-based creative writing assistants• Plotagon• Short Edition• ScriptBook (for screenwriting)



Tutoring

24/7 Accessibility : Students can access help at any time, whether they are working on homework in the evening or preparing for exams over the weekend.





Eight common education problems

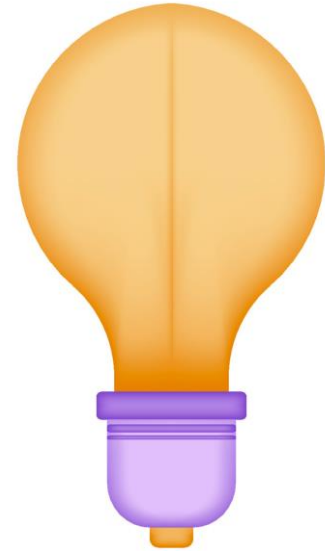
1- A standardized curriculum does not cater individual needs	5- Personalized communication is almost impossible due to the scale
2- Limited 1-2-1 tutor time available for university students	6- Selecting the best students from a large application pool
3- Grading & assessment is time-consuming, with an over-reliance on multiple-choice	7- Increasing dropout rates at universities
4- Large class sizes in k-12 schools means children's questions often go unanswered	8- The need of effectively combat plagiarism and ensure authorship





AI Solutions

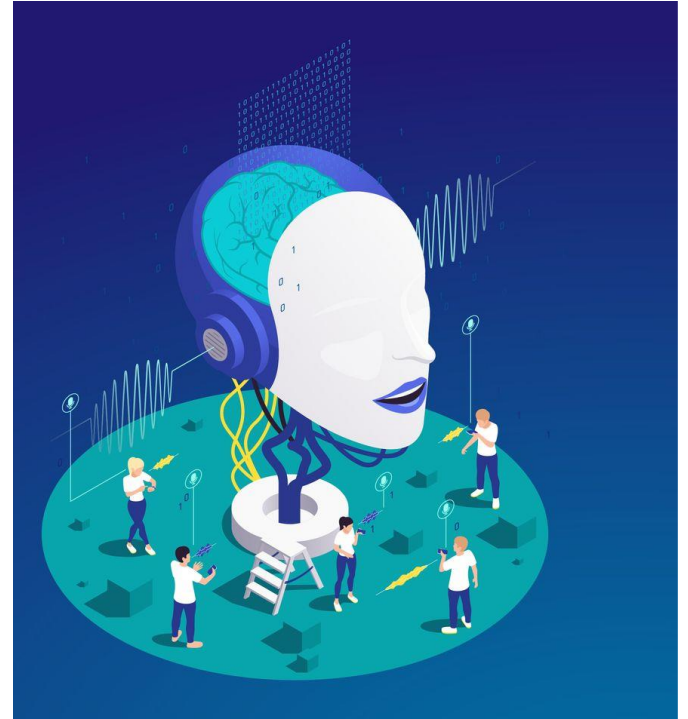
1- Personalized Learning	5- Chatbots can answer administrative questions on the fly from parents, staff, and students.
2- Personal virtual tutors	6- AI can shortlist candidates based on multiple data points
3- AI can assess open-ended questions and in real-time	7- AI sentiment analysis
4- virtual classroom assistants	8- Natural language processing can identify patterns and source facts





Applying generative AI in education

- Creating Educational Content
- Personalized Learning
- Creating Virtual Assistants for Learning
- Automated Grading and Feedback
- Data-Driven Insights
- Language Learning and Translation





Ethical considerations of AI in education

The incorporation of AI into the educational landscape gives rise to significant ethical concerns.

Privacy, data protection, and the potential for algorithmic bias demand close attention.

Educational institutions must guarantee transparent data handling, informed consent, and robust security measures. Furthermore, AI algorithms should be crafted to counteract bias and uphold fairness, preventing the perpetuation of existing inequalities.

The establishment of ethical guidelines and regulations is imperative to steer the responsible adoption of AI in education.





Advantages

- **Efficiency & Scalability:** Generative AI can serve single classrooms or entire universities, providing consistent quality across the board.
- **Personalization & Flexibility:** Instead of one-size-fits-all, we're looking at tailor-made education experiences.
- **Accessibility:** Particularly significant for remote areas or underfunded institutions. With AI, quality resources can be omnipresent.



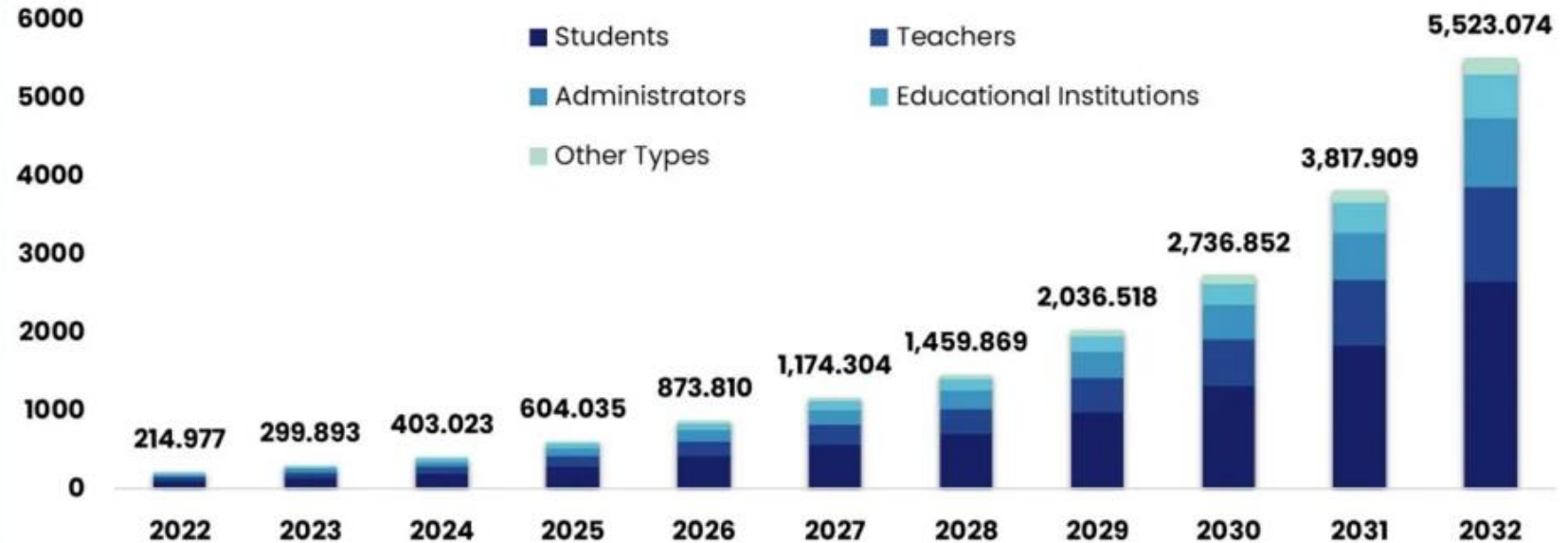
Challenges

- Ethical Quandaries: With data input comes data privacy concerns. How do we safeguard student information?
- Content Integrity: Can AI-generated content always uphold educational rigor? Is there a risk of misinformation?
- Tech Dependency: An over-reliance could stymie organic critical thinking and human interaction, essential facets of holistic education.



Generative AI in education market

Size, by Type, 2022–2032 (USD Million)



The Market will Grow
At the CAGR of

39.50%

The forecasted market
size for 2032 in USD

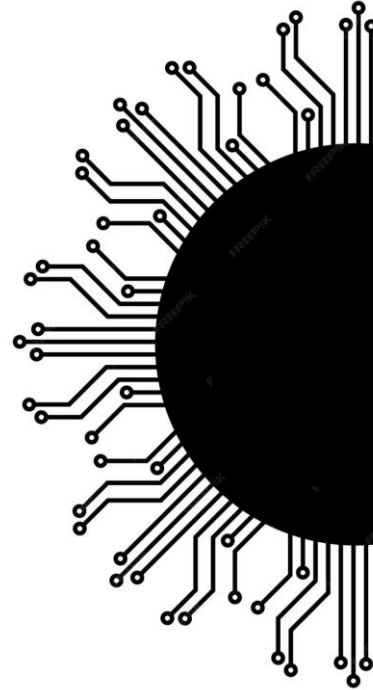
USD 5,523.074Mn



MarketResearch
WIDE RANGE OF GLOBAL MARKET REPORTS



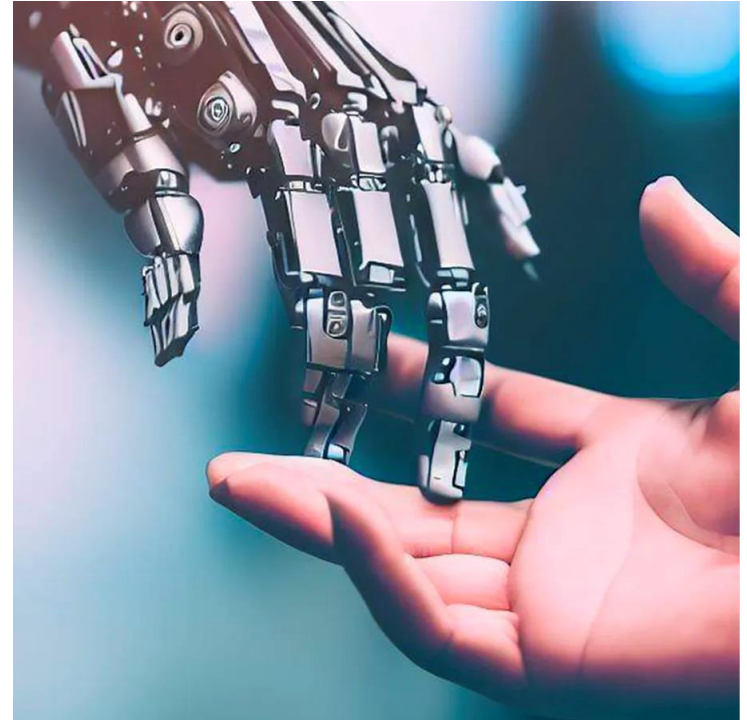
Collaboration between Humans and AI





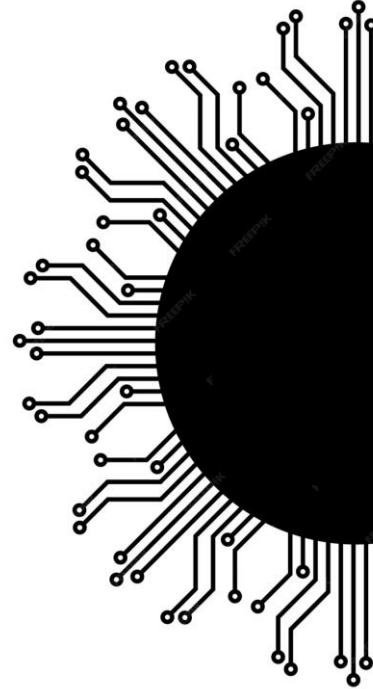
Collaboration between humans and AI

The successful integration of AI in education requires collaboration between humans and AI. AI should not replace teachers but rather serve as a valuable tool to augment their expertise. By leveraging AI's capabilities, teachers can personalize instruction, provide timely feedback, and support students' individual needs more effectively. The collaboration between humans and AI can create a powerful educational ecosystem that combines the best of both worlds.





The Future of AI in education





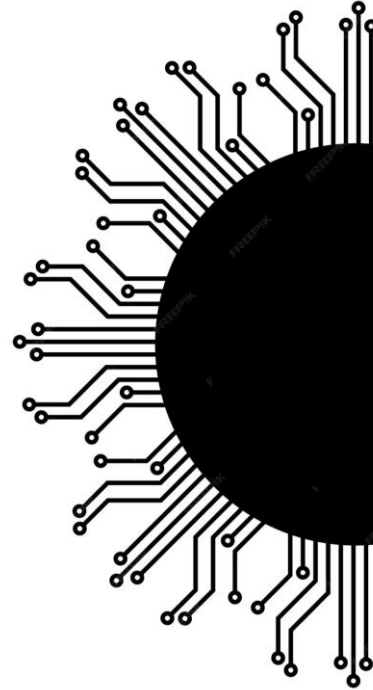
The future of AI in education



The future of AI in education is bright. With advancing technology, AI will further personalize learning, streamline administration, and transform educational methods. Yet, ethics, accessibility, and teacher training are vital for responsible AI use. By harnessing AI's potential and addressing its challenges, we can create a future of more accessible, inclusive, and effective education.



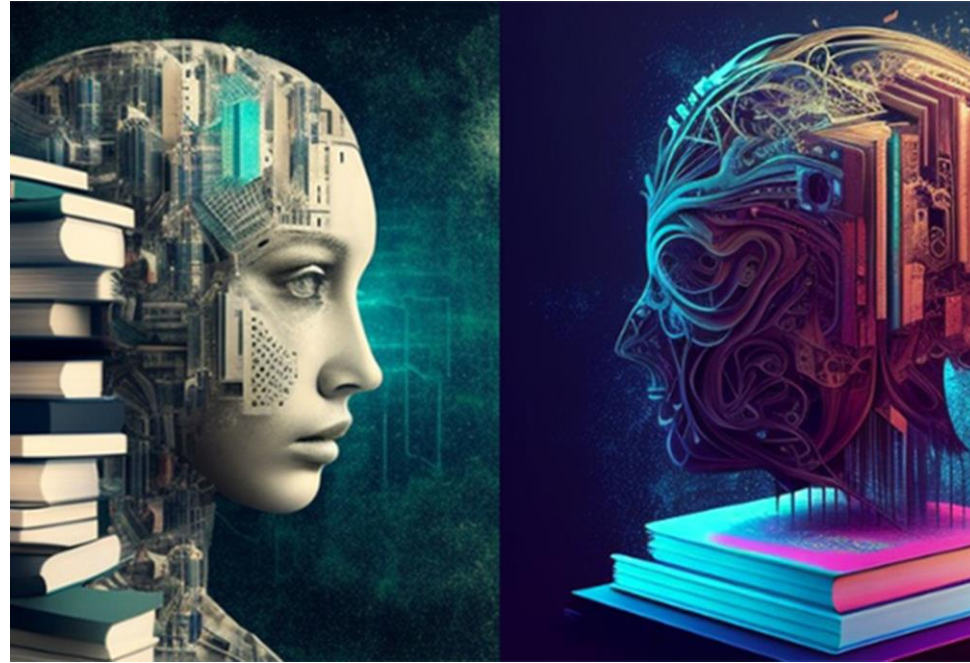
Conclusion





Conclusion

AI-powered education reform empowers students, improves instructional strategies, and encourages lifelong learning. AI has enormous potential in teaching, despite certain obstacles. We may use AI to build a more open, welcoming, and efficient educational system by embracing moral values, encouraging human-AI collaboration, and tackling equity issues. Let's take use of the chances AI offers to improve education in the future.





Thank you for your attention.



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