

## BENEFITS OF USING ARTIFICIAL INTELLIGENCE TOOLS IN EDUCATION

James Osondu<sup>1</sup>  
e-mail: [jasondu@yahoo.com](mailto:jasondu@yahoo.com)

### Abstract

*Artificial intelligence (AI) is impacting education in many ways. From virtual assistants for personalized education, to student or teacher tracking systems, the potential benefits of AI for education often come with a discussion of its impact on privacy and well-being. At the same time, the social transformation brought about by AI requires reform of traditional education systems. In this study, a comparative analysis methodology was made in this study, and the best free tools under 10 categories regarding education were identified to view their similarities and differences. The focus of the study was on the benefits these tools regarding the needs of students:*

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### Introduction

In this study, a comparative analysis methodology study was made on the following groups of categories that tender to the needs of students by providing various AI software tools that provide solutions to specific needs of students. The focus of the study was on the benefits these AI software tools regarding the needs of students.

Andre Smith in his article suggested that as a catalyst for educational innovation, AI has demonstrated its capacity to enrich teaching and learning experiences remarkably. Its ability to enable personalized learning, improving accessibility, and enhancing student commitment, Artificial Intelligence tools are reevaluating the educational norms and expectations.

The significance of Artificial Intelligence in education goes beyond mere technological transformation. It extends to shaping the minds that will navigate the future. For students, AI tools can provide custom-fit educational experiences, supplementing their unique learning curves with responsive feedback and resources. For lecturers, these tools offer effective means to automate administrative

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<sup>1</sup> Chief Assist., PhD, Department of Statistics and Econometrics, Faculty of Business Administration, Sofia University „St. Kliment Ohridski“ (SU), Sofia, Bulgaria

tasks, lecturing tasks, identify student learning patterns, and therefore, facilitate more engaging instruction.

The use of AI tools in education presents an exciting perimeter for exploration and innovation. In this article, I search into the world of AI in education and uncover some of the best free AI tools available for students and lecturers as shown by the following authors (Cohen, 2023; Stanford GSE Office of Innovation and Technology, 2023; Rickman, 2023; Chakraborty, 2023). By examining these tools, we aim to shed light on the transformative potential of AI in encouraging an enriched and inclusive educational perspective.

According to a paper published by Fitria (2021a) Artificial intelligence or (AI) is a technology where machines can learn and understand logic like humans. This technology is said to be able to help simplify human life which is very complex as mentioned by Fitria (2021a). AI itself works by combining the presence of several data, iterative processing, and intelligent algorithms. This allows the software to learn automatically from patterns or features in the data. AI can also be said to be a very broad field of study. The scope of theories, methods, technologies, and subfields that exist in AI is very wide, including machine learning, neural networks, cognitive computing, computer vision, and scientific language processing. The role of Artificial Intelligence (AI) technology is increasingly evident in various sectors, including the education sector. The presence of AI technology has transformed the educational curriculum, especially in the fields of technology, science, mathematics, and engineering. But AI will also change the face of the world of education. One technology that has recently received attention is Artificial Intelligence (AI). This technology has an important role in facilitating various job functions, including in the field of education. AI can also be implemented in the world of education. Teachers/lecturers can understand student needs more easily and more deeply (Fitria, 2021b). The students also can learn according to their needs without encountering difficulties

Thus, we can say that Artificial Intelligence (AI) is no longer a futuristic concept; it is a reality transforming the field of education. Today, we see AI's influence in various facets of education, from personalized learning platforms and intelligent tutoring systems to predictive analytics tools for student performance and even administrative task automation.

And according to Smith (2023), he stated that Artificial Intelligence's role in education is multifaceted. It allows for the development of individualized learning paths, where content is customized to cater to each student's unique needs and pace. AI tools can analyze a student's response to problems and automatically adjust difficulty levels, providing real-time feedback to enhance the learning process. Furthermore, AI can aid teachers by automating grading

and administrative tasks, freeing them to focus more on student interaction and instruction.

The different types of Artificial Intelligence Tools for Students can be categorized by the types of tasks performed by the student and that results to the solution provided by the Artificial Intelligence Tools.

Aside from the popular/current Artificial Intelligence tools, there are many other innovative applications of AI in education. For example, AI chatbots provide instant support and answers to common student queries, reducing response times and improving accessibility.

Additionally, Artificial Intelligence algorithms can analyze vast amounts of educational data to identify patterns and trends, helping lecturers make data-driven decisions to enhance teaching strategies.

As technology continues to evolve, the potential for Artificial Intelligence tools for students is limitless. These tools not only assist students in their learning journeys but also empower educators to create more personalized and effective learning environments.

In this study, A comparative analysis methodology study was made on the following groups of AI applications that tender to the needs of students by providing various AI software tools that provide solutions to specific needs of students. The focus of the study was on the benefits these AI software tools regarding the needs of students. There are 10 categories under which various AI software that tend to various needs of students were compared and each group has various software that helps the students in solving the problem of their need. The 10 categories are listed below.

1. Adaptive Learning Platforms.

Adaptive learning platforms utilize AI algorithms to deliver personalized learning experiences to students. These platforms analyze individual learning patterns and adjust the content, pace, and difficulty level accordingly. Adaptive learning platforms optimize student engagement and knowledge retention by providing customized learning pathways.

2. Intelligent Tutoring Systems.

Intelligent Tutoring Systems (ITS) leverage AI to provide personalized guidance to students. ITS analyzes student performance data and offers real-time feedback and targeted interventions. By adapting to each student's needs and learning style, ITS enhances understanding and mastery of complex concepts.

3. Virtual Reality (VR) and Augmented Reality (AR) Applications.

VR and AR technologies revolutionize education by creating immersive and interactive learning experiences. AI-powered VR/AR applications enable students to explore historical events, visit far-off places, and engage in hands-on

experiments. These tools enhance student engagement, promote critical thinking, and foster a deeper understanding of subjects.

#### 4. Natural Language Processing (NLP) for Language Learning.

NLP technologies empower language learning by providing advanced speech recognition and translation capabilities. AI-powered language learning tools assist students in pronunciation, grammar correction, and translation. These tools offer personalized language learning experiences and facilitate practical communication skills development.

#### 5. Intelligent Writing Assistants.

AI-driven writing assistants offer students real-time feedback on their writing, assisting with grammar, spelling, and style. These tools leverage machine learning algorithms to improve writing skills and enhance the overall quality of written assignments. Intelligent writing assistants also foster creativity and critical thinking through suggestions and prompts.

#### 6. Data Analytics for Student Performance.

Data analytics tools utilize AI algorithms to analyze student performance data, offering insights into individual and collective progress. Educators can tailor their teaching strategies and provide targeted interventions by identifying learning gaps and patterns. Data analytics tools enable evidence-based decision-making to optimize student outcomes.

#### 7. Chatbots for Student Support.

AI-powered chatbots provide round-the-clock student support, answer queries, and offer guidance. These virtual assistants assist with administrative tasks, course information, and study resources. Chatbots alleviate the burden on administrative staff and enhance student satisfaction by providing instant and accurate responses.

#### 8. Gamification for Learning.

AI-driven gamification tools integrate game elements into the learning process, making it more engaging and interactive. These tools utilize AI algorithms to adapt the game mechanics to individual student needs, fostering motivation and knowledge retention. Gamification promotes collaboration, problem-solving, and a sense of achievement among students.

#### 9. Personalized Recommendations and Content Curation.

AI algorithms analyze student data and preferences to offer personalized recommendations and content curation. These tools suggest relevant learning resources, books, articles, and videos, catering to individual interests and learning goals. Personalized recommendations enhance self-directed learning and expand students' knowledge horizons.

#### 10. Smart Classroom Management Systems.

AI-powered classroom management systems streamline administrative tasks, such as attendance tracking, grading, and scheduling. These tools optimize time management for educators, allowing them to focus more on instruction. Intelligent classroom management systems also leverage AI to detect signs of student disengagement and suggest interventions for proactive teaching.

**Below is discussed how the 10 categories provide solution to students.**

1. This first category namely the Adaptive Learning Platforms provide solution to students that have a unique learning need, that is addressed by providing them with customized resources and activities to address their unique learning needs.
2. While intelligent tutoring systems help students learn geography, circuits, medical diagnosis, computer programming, mathematics, physics, genetics, chemistry.
3. The category Virtual Reality (VR) and Augmented Reality (AR) Applications offer new opportunities for students to interact with 3D objects, explore their environment, and gain a greater understanding of concepts. AR and VR can also be used to create interactive simulations, allowing students to explore complex concepts in a safe and engaging environment.
4. Under this category Natural Language Processing (NLP) for Language Learning: the AI tools provided helps the student in teaching and learning language-related subject matters– i.e. reading, writing, speaking, and also using language to teach any subject i.e. , teaching in the disciplines. This tools also help in processing language to support the needs of students, lecturers and researchers by providing, study forums, textbooks, lecture materials
5. For this category regarding the Intelligent Writing Assistants: AI was found to enhance students' writing abilities, self-efficacy, and understanding of academic integrity. However, some students expressed concerns about potential impacts on creativity, critical thinking, and ethical writing practices but these can be overcome by a balanced approach to AI integration, where AI collaborates with human authors.
6. The category Data Analytics for Student Performance; uses tools that can help strengthen the bond between students and the university and increase graduation rates. Also, data analytics tools can help strengthen the bond between students and the university, increase graduation rates
7. The category regarding Chatbots for Student Support: help students get answers to their questions quickly and efficiently. They don't have to read

through a lengthy FAQ document or wait to receive an email response from an administrator.

8. The category regarding Gamification for Learning; is One of the most popular and effective examples of gamified learning is game-based quizzes. Instead of using the traditional multiple-choice test design to assess your team's understanding of certain topics, you can present the questions in a format that looks like your traditional smartphone games
9. This category namely Personalized Recommendations and Content Curation; Use technology in education and challenge your students with Kialo Edu. Allow students to participate in participate in group discussions, collaborative learning and ongoing conversations.
10. The last category names Smart Classroom Management Systems; enable educators to efficiently manage class materials, assignments, assessments, and communication with students, all within a digital space.

In conclusion, choosing the right AI tool for your needs requires careful consideration of compatibility, effectiveness, reliability, and understanding the limitations.

### **Other discussions on how Artificial Intelligence educational tools benefit students are shown below**

Education is a complex process in which we not only acquire knowledge of various concepts but also learn to apply them in daily life with our social skills. Machines cannot teach empathy, sympathy, and other emotions that are an important part of our personality development. This means that no matter how sophisticated AI is, no matter how many examples of using AI, this technology will not be able to replace the role of teachers or educators. The role of AI is limited to helping and empowering teachers in making the learning process a fun experience for students. The role of IT is also often used in supporting learning, either in schools or for self-learning. In the future, learning activities will apply more artificial intelligence. AI can be used to present learning materials, conduct assessments, provide learning feedback. Artificial intelligence has been widely applied to various educational technology platforms. The following are some examples of applying artificial intelligence to support learning such as 1) Virtual Mentor, for example, Blackboard to publish notes, homework, quizzes, and tests that allow students to ask questions and assignments for the assessment process. Applications are widely used by professors/lecturers to publish notes, homework, quizzes, and tests that allow students to ask questions and assignments. Applications can also be used for assessment/assessment. 2) Voice Assistant, for example, Google Assistant (Google), Siri (Apple), Cortana (Microsoft), and others. Voice Assistant

allows students to search for materials, reference questions, articles, and books by simply speaking or mentioning keywords. Voice Assistants allow interaction with various learning materials without communicating with the teacher. 3) Smart Content to share and find programmable digital book and material content more easily and quickly. Common examples of the application of this technology are found in various digital libraries today, both in schools, universities, and public libraries. For example, are Cram101 to finds and categorizes digital books quickly and in a structured way. Then, Netex Learning offers a personalized cloud platform with virtual training, conferences, and more. It also looks for material or topic, this platform will recommend various multimedia such as books, videos, and various virtual training. 4) Presentation Translator. This technology also has an important role for those who have limitations in terms of language and vision, so that this technology has been widely adopted for various needs. 5) Global Courses, for example, MOOCs, Udemy, Google AI, Alison, Khan Academy, edX, Udacity, Coursera, and others. There is a personalization feature that allows us to be notified about course progress, material that needs to be studied, test accumulation, total scores, relevant course recommendations, and various other features. AI-based solutions will help schools and universities that have international programs to create classes based on the curriculum and customize learning experiences that are tailored. 5) Automatic Assessment, for example, AI platform for online automatic assessment and question correction purposes. The use of features like this makes it easier for teachers and tutors to prepare and conduct quizzes and tests easily and practically. Teachers and tutors no longer need to make questions and correct questions manually. The use of features like this makes it easier for teachers and tutors to prepare and conduct quizzes and tests easily and practically. 6) Personalized Learning for example TalentLMS and more. This allows students or users to get services like personal assistants. AI technology has a significant impact in improving the quality and learning patterns to be more practical and effective AI in education enables schools or educational institutions to create more personalized learning experiences. 7) Educational Games, for example, Duolingo, Khan Academy Kids. Quick Brain and Puzzle Kids. Educational games are games that are designed to learn but can still offer play and fun. Educational games are all forms of games that are created, to provide an educational experience or learning experience to the players of the game. This children's educational game is not just a picture-matching game, but many tricks that hone children's memory, Moms. This game is suitable for training memory, concentration, accuracy, attention, thinking speed, and logic skills. 8) Intelligent Tutoring System (ITS) as known as Intelligent Computer-Aided Instruction is a system to provide teaching that can adapt to students' abilities.



Other examples of AI Tools discussed regarding On essay-writing and to combat writer's block, students can copilot with an AI to generate new ideas or invigorate their writing with more varied language structures as reported by (Stanford GSE Office of Innovation and Technology, 2023). In one case, Mina Lee from Stanford University developed CoAuthor, a human-AI collaborative writing dataset based on GPT-3 (the basis of ChatGPT) to assist creative and argumentative writing. The dataset hooks into a collaborative interface where the writer is presented with several AI-generated suggestions that the writer can choose and modify. Such tools hold promises to augment human creativity by supercharging the ideation process as well as helping to pivot ideas in novel directions. However, this new capability raises important questions around plagiarism and assessment – which, fittingly, AI-driven anti-plagiarism startups are looking into. This all underscores the importance of critical thinking, as students will be evaluating and editing ideas as much as producing them.

In all, we cannot avoid accepting the new technology. Artificial Intelligence tools for education have become an increasingly common usage in the education system. The implementation of Artificial Intelligence tools in education may bring significant changes to how to teach and how to learn as shown by a report on Artificial Intelligence and the Future of Teaching and learning (Cardona, Rodríguez, and Ishmael, 2023).

One can better analyze and utilize it for the improvement of learning performance and teaching strategies. Also, it is critical to strike a balance while using Artificial Intelligence tools in education. It is assured that with the further update and enhancement of Artificial Intelligence tools, education will be even better in the future.

### **Limitations of applications of AI in education**

There are surely limitations of applications of AI in education and Selwyn (2024) in his paper concludes that these limitations can be dealt with a call for slowing down and recalibrating current discussions around AI and education – paying more attention to issues of power, resistance, and the possibility of re-imagining education AI along more equitable and educationally beneficial lines. The following limitations are the ones that can be dealt with accordingly by discussions around AI and education: (i) the limited ways in which educational processes and practices can be statistically modelled and calculated; (ii) the ways in which AI technologies risk perpetuating social harms for minoritized students; (iii) the losses incurred through reorganizing education to be more ‘machine readable’; and (iv) the ecological and environmental costs of data-intensive and device-intensive forms of AI.



### **Future Trends in AI for Education**

- AI is expected to play an increasingly significant role in the lecture hall.
- Some predictions for AI in the lecture hall include the development of intelligent tutoring systems that can provide even more personalized and adaptive instruction to students.
- Furthermore, AI is expected to revolutionize online education. With the rise of remote education, AI tools can facilitate flexible learning experiences regardless of geographical location.
- AI powered virtual classrooms and collaborative platforms can enhance the overall online studies experience by fostering engagement and interaction among students and instructors.

### **Conclusion**

In the Introduction, I introduced how significant is Artificial Intelligence to education and how the use of AI tools in education presents an exciting perimeter for exploration and innovation. I also discussed the 10 categories under which various AI software that tend to various needs of students were compared and each group has various software that helps the students in solving the problem of their need, then I also discussed how the 10 categories provide solution to students. Also. Additional discussions on how Artificial Intelligence educational tools benefit students were shown.

I also looked at the limitations of applications of AI in education and finally I also discussed the future trends in AI for education

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