

Learning in the Era of AI

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Abstract: Artificial intelligence (AI) has become a highly discussed topic in the world of technology. The interaction between artificial intelligence and education has entered a new era, transforming the traditional style of teaching and learning to a whole new level. This paper delves deep into the role, position, advantages and disadvantages of artificial intelligence in the education system of today's world. AI tools such as ChatGPT, Quillbot and other softwares have their benefits, leverage, and some potential challenges with regards to the academic curriculum. Looking ahead, the paper speculates on the future of the landscape of AI in education and the potential overreliance on software tools, and the need for equitable access to AI-enhanced educational resources.

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I. INTRODUCTION

After the deployment of ChatGPT, a very well known AI tool in December 2022, it has garnered a wide range of focus. With this new innovation, people have found a new way to learn and have made their research work easier. Although it may sound very promising and outstanding, every innovation has its own drawbacks and potential challenges. The advantages of incorporating AI in education are sophisticated. Chatbots like ChatGPT have emerged as potent tools that facilitate interactive and diverting learning environments. The chatbots use NLP (natural language processing) and various other machine learning models to interact with users, providing new information, answers to their queries and generating contextually relevant content. While some emphasize on the potential help and benefits of AI and chatbots for enhancing the learning experience, some raise concerns about its drawbacks and negative outcomes. In this review paper, we view both the viewpoints of the audience and try to find a balanced understanding of the use of this technology. We aim to offer a thorough overview of the current landscape of AI in education. Considering artificial intelligence's contribution, we further discuss its effects and the consequences on students learning and the effects and affects it has had on the academic curriculum. We finally try to conclude by coming to a balance between its benefits and drawbacks altogether.

II. DEEP DIVE INTO CHATGPT

ChatGPT is a new, cutting-edge conventional AI model developed by OpenAI. It is engineered to generate responses that feel natural and human-like. ChatGPT undergoes an initial training phase where it is programmed to project the outcome in a sentence based on the context set by the prior words. This plays a keen role in forming a proper response. After the initial training, the model is tuned to distinct datasets to tailor its behaviour for a specific task or application. It is based on GPT 3.5 architecture. Its deep learning capabilities enable it to understand complex patterns and contextual nuances, contributing to its outstanding language generation texts. ChatGPT is a layered structure; the model consists of several distinct neural network models. It helps in learning complex representations of language, capturing both logical and global dependencies. Prompt engineering plays a crucial role in refining ChatGPT's behaviour. The choice of prompts and instructions are computed during the training cycle, which later influences the model's responsiveness towards user inputs. The ChatGPT's performance involves using benchmarks and metrics such as perplexity, BLEU scores and human evaluation. These metrics help the model assess its language understanding, cohesion, coherence and overall effectiveness. ChatGPT finds applications in conversational agents, chatbots and virtual assistants, demonstrating its potential to present human-like texts. The model's potential to generate human-like response makes it suitable to use for content creation, helping users to draft emails, write articles and engage in various forms of written communication.

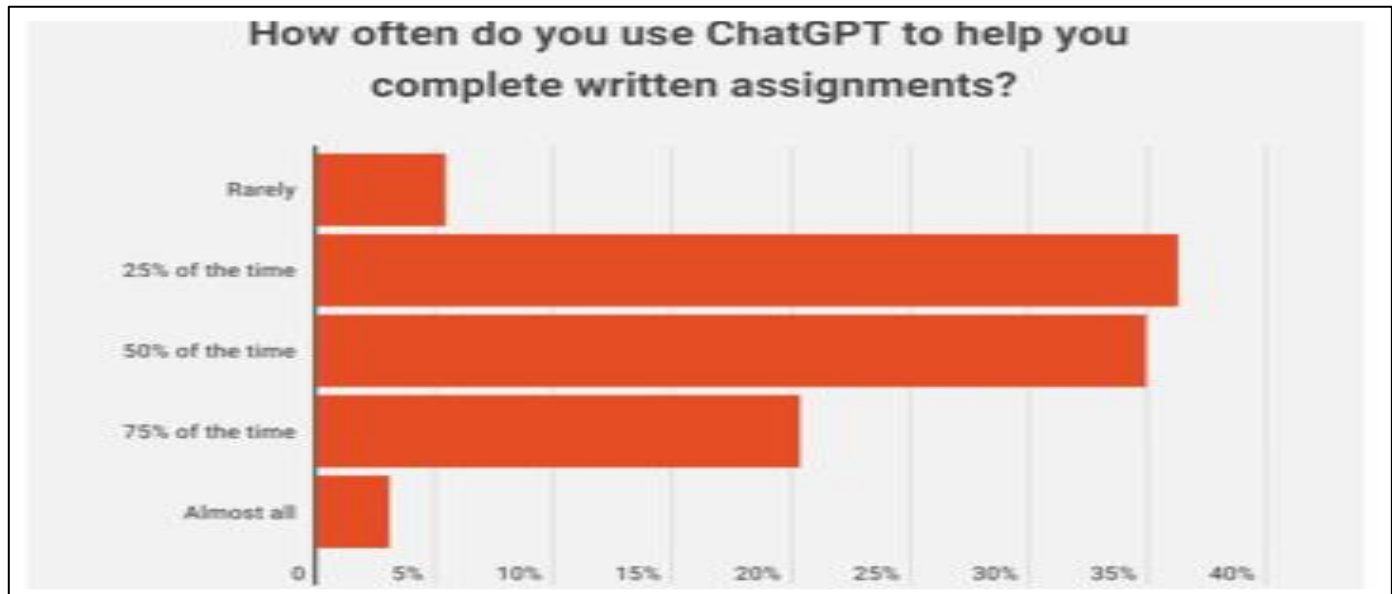


Fig 1: Student usage of ChatGPT

III. INTERACTION BETWEEN STUDENTS AND AI

Artificial intelligence has revolutionized the world with new innovations and models, which has had a massive impact on general people especially students. It has contributed significantly towards education. We can also see a significant rise in the interaction between students and technology. AI systems offer effective support for online learning and teaching, providing personalized learning experiences and powering adaptive assessment. Students tend to use multiple artificial intelligence models such as QuillBot, Blackbox.ai, ChatSonic, YouChat, Perplexity ai and especially ChatGPT. These tools can generate human-like texts and that makes it more beneficial for general users to understand the responses. These softwares use various deep learning models to understand complex inputs from the students and provide the appropriate response to the given input.

From the figure attached, we can generalize the use of ChatGPT by students for various purposes. More than 80% is used for homework by students. Slightly more than 50% is used to write essays and slightly under 50% is used for at home tests.

Day by day the consumption of these artificial intelligence software tools are increasing more and the reliance on books are decreasing.

A. "The Transformative Influence of AI: Elevating Student Learning Experiences"

As discussed earlier, artificial intelligence has made its contribution towards the way students learn and how it has made their work easier. The integration of ChatGPT and other advent of chat-based AI models has brought about significant benefits for students and transforming the landscape of education, putting out a whole new way to have efficient learning. By enhancing the capabilities of machine learning

and natural language processing, ChatGPT models have become indispensable tools in the modern educational landscape.

One of the most significant advantages of ChatGPT for students is the personalized learning experience it offers. These chatbots can adapt to various individual learning styles, preferences, and paces. It provides tailored explanations, examples, and resources. Students can engage in interactive conversations with ChatGPT models, asking questions, seeking clarification, and receiving immediate responses. This personalized approach promotes active learning, fosters critical thinking, and ensures that students grasp concepts effectively. ChatGPT helps students select and understand the response in the way they want to understand it since ChatGPT can generate multiple responses and does not stick to only one particular solution.

Before the technological era, students tend to learn from particular textbooks that were recommended by their teachers. The books generally provide one generic solution that students tend to understand and try to memorize the exact words and sentences. With the launch of artificial intelligence model like ChatGPT, students can get access to numerous different solutions to one particular question without having to stick to one solution. Students can grasp the answer, which is put up in a simpler way without any complex wording. Not only does it provide diverse solutions, but it also helps students unravel their curiosity about the fundamentals of a particular question.

AI models can provide a personalized learning experience by adapting the unique learning styles of individual students. It can provide abundant resources in regards to student's specific queries or areas of difficulty. Models like ChatGPT are available 24/7, and students can access them whenever they want. This can be very beneficial for students who prefer to study at unexpected times or require an urgent, detailed explanation of a particular

question. Apart from its all-time availability, it also provides students with instant feedback on their assignments, quizzes, or questions. The feedback helps the students rectify their mistakes or come up with more efficient solutions.

The interaction between AI models and students has had a significant impact on the education system and is more enjoyable. It helps to make the learning process more diverse and dynamic. Interacting with models like ChatGPT can promote critical thinking skills among students. They can assess and analyze the responses from these models later, evaluate the information, develop their own perspectives, and come up with a better solution to a particular query. AI models facilitate collaboration and communication among students. They can use the models to discuss their ideas and knowledge and even work together on projects without depending on anyone else.

AI models can also support students with disabilities. They can use the model to interact with their teachers and fellow students, ensuring equal opportunities for every student. AI models such as ChatGPT model 3.5 are free to use; students need not worry about expenses to learn basically anything. It is also time-efficient; students need not go to different places to look for books to resolve their doubts and areas of difficulty. With the help of AI models, students can go beyond their academic curriculum and explore new ideas and skills. It can help them delve deep into their particular interests, evolving a new fun and interesting way to learn different topics.

AI models can also be used to summarize paragraphs, papers, and reports. Without going into detail about the work, we can ask the model to summarize the entire paper and provide the key points. This is very useful for people who are only curious about the working part and the key value points. It can also have an impact on writing skills; it provides suggestions and corrections for grammar, spelling, and syntax, helping writers improve the accuracy of their writing.

B. Conversational AI Innovations: Beyond ChatGPT

Since the launch of ChatGPT, several similar models have emerged with the intention of making student life more comfortable and enhancing the learning methodology. Apart from ChatGPT, QuillBot helps students while writing papers, reports, articles, and other writing assignments by having a quick scan and highlighting the words with spelling mistakes or unrecognized words, which helps the students write in a more efficient and presencible manner. Another such model is known as Cymath, which helps students who face difficulty with mathematics. Cymath provides a step-by-step, detailed explanation of the mathematical question and how to tackle and approach similar questions. By solving numerous such questions, students get a grasp on the concept and understand the fundamentals better. Jotbot is another AI-powered writing assistant that mimics student's personal writing styles and is equipped with immediate note-taking, source coordination, and premium editing tools, which later help students write notes in their own handwriting without having to write them physically.

One of the most advantageous artificial intelligence models developed is known as Blackbox.AI. Blackbox is specifically used by students who are interested in computer science and learning any programming language. It is a software tool that provides a detailed explanation of how a specific code works and what logic has been used. It works on a similar way to how ChatGPT works: the user can ask a query or their area of difficulty on a specific programming logic and the tool hands out a detailed explanation of the logic used in the program and also provides the code for the specific question. The most convenient part about this tool is that the user can ask a query and choose the programming language they want the output in. The programming languages offered by Blackbox.AI are Python, Java, Rust, HTML, Javascript, React, Flutter, Next.js, AngularJs, Swift, MongoDB, Pytorch, XCode, Azure, Heroku, Godot, Go, Gitlab, Git, Flask, and FastAPI.

Each and every day, the tech world is evolving, and something new is being innovated. Presently, students are increasingly incorporating a myriad of artificial intelligence tools into their daily learning routines. Each day, student's lives are being more molded by technology. Every student is using the AI tools for their own betterment and improvement.

C. Exploring the Limitations: AI Tools and Student Learning

Every tech revolution comes with its own limitations and challenges. Artificial intelligence tools have come a long way and have had an impact on the entire education system and academic curriculum. Tools like ChatGPT have switched from a non-profit to a business-focused approach. BestColleges in the U.S. did a survey about this. They narrowed down the students' viewpoints on the use of models like ChatGPT. Results showed that more than half of the students considered using ChatGPT for their assignments and even during examinations.

One of the significant concerns about AI tools revolving around the education curriculum is the potential loss of human touch. Traditional classrooms provide an interactive session between the student-teacher and the student-student. It helps to develop interpersonal relationships between the students and the teachers by providing emotional support and personalized guidance. AI tools may lack an emotional connection with the students. Inside the classrooms, the students can find the topic more enjoyable to learn with their fellow classmates. After all, AI models are just tools without any sentimental behavior. Students can also socialize inside the classroom and do not have to feel the need for isolation, which keeps their mental health at ease. In spite of the fact that AI tools may provide numerous solutions to a given question, they lack the human intelligence to explain the solution while taking real-life examples to make students understand the solution. Inside traditional classrooms, the teacher is likely to explain the topic using real-life practical examples to make the students understand it better. Students can remember the concept much better by relating it to the examples instead of cramming up the solution.

To generate texts, the AI tools require the collection and analysis of lots of data, which causes concerns about privacy and security. It's important to keep student data safe and use it carefully." Additionally, AI systems may be susceptible to manipulation or tampering, which can result in outcomes that are unreliable or biased.

Each and every passing day, students are becoming more and more dependent on tools like ChatGPT. According to the latest available data, approximately 13 million unique people use ChatGPT each day, which is around 2 times more than the past month.

The above figure shows how often students use ChatGPT to help complete their assignments and homeworks.

Based on Pew Research Center, around 1 in 5 U.S. teens aware of ChatGPT have used it for schoolwork. Older teens are more likely to use the chatbot for help with homework. About one-fourth of 11th and 12th graders who know about ChatGPT say they have done this. This percentage falls to 17% among 9th and 10th graders and 12% among 7th and 8th graders. Plagiarism is one of the major issues that has been raised since students started using AI models such as ChatGPT to complete their tasks provided by their teachers. Day by day, students are relying more on AI tools than doing tasks themselves. For tasks like writing essays, articles, reports, and homework, AI tools can generate all the answers and even write them down. Students rely more on those solutions than on thinking and writing with their own critical minds. This makes the students lazy and degrades their thinking capacity.

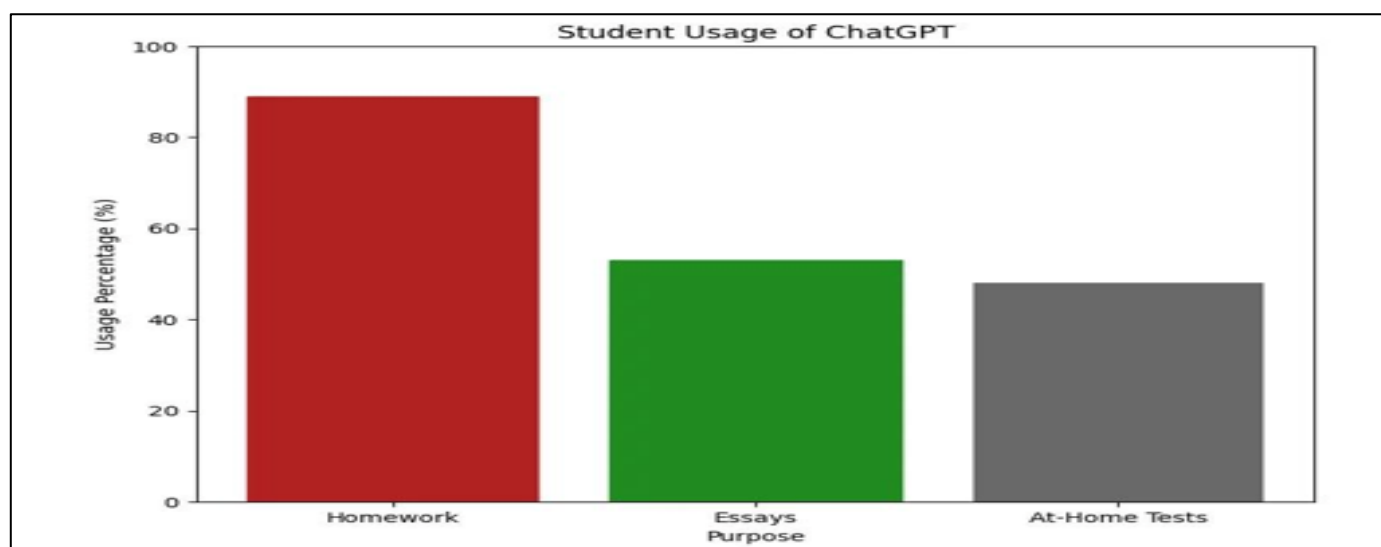


Fig 2: Students Reliance on ChatGPT

ChatGPT and other AI language models may have limitations in understanding complex, nuanced, or context-dependent questions or prompts. Students might receive inaccurate or misunderstood responses, potentially leading to confusion or misinformation. Additionally, the AI model's responses may lack the ability to provide meaningful explanations or justifications, limiting students' understanding of the underlying concepts. AI models like ChatGPT need tons and tons of data to generate specific outputs. Since they need preprocessed data, the outputs generated may not be accurate, and there is also the possibility of generating outdated data. Students who rely solely on the chatbot may unknowingly absorb incorrect information, leading to misconceptions and gaps in their knowledge.

D. Learning to Learn AI Models

With the adaptation of AI tools, students need to first learn how to use these models. To fully leverage the benefits of ChatGPT in education, students must invest time and effort in understanding how to effectively use the tool. They need to learn the specific commands, prompts, or formats required to interact with the chatbot successfully. This learning curve can be a challenge for some students, especially those who

are less technologically inclined or have limited experience with AI tools. Incorporating tools like ChatGPT into the educational process may require students to depend on external tools or platforms. This reliance can introduce additional complexity and potential barriers, such as the need for stable internet connectivity, access to specific software or applications, or compatibility issues with different devices. Such dependencies might limit the accessibility and usability of the AI tool for certain students or institutions. While using AI models, students may face the potential risk of getting distracted or losing focus on their desired task. Students might spend excessive time exploring the capabilities of the chatbot rather than focusing on their assigned coursework or learning objectives.

AI models like ChatGPT may struggle with understanding the context and relevance of specific academic questions or topics. Students need to carefully frame their queries and interpret the responses generated by ChatGPT to ensure they align with their academic requirements. With that comes the risk of ethical concerns. Students should learn about the dos and don'ts if they want to use AI models like ChatGPT in their academics.

IV. BALANCING THE SCALES

The ability to adjust and keep learning are both vital talents for students of this era, as the tech world is making progress and advancing. By committing to continuous learning, students can maximize the benefits of the new innovations in their academics and career paths ahead. Viewing ChatGPT as a valuable supplement to their education, students should understand that it enhances rather than substitutes for their independent critical thinking. Effectively utilizing ChatGPT involves leveraging it as a resource to broaden knowledge, explore diverse perspectives, and complement their own analytical abilities, rather than depending solely on it for definitive and GPT-based answers. ChatGPT can be a valuable tool for generating ideas, outlines, or suggestions for writing assignments. However, students should actively contribute their own thoughts, analysis, and critical insights to the writing process. ChatGPT should not be used as a substitute for original thinking and creativity.

Teachers should incorporate AI models into their curriculum and teach the students how to use the models to their own benefit rather than just using them for plagiarism and generating solutions without any self-effort. Students can benefit from talking to teachers or mentors about how to use ChatGPT wisely in their studies. Teachers offer helpful advice and feedback and can guide students through the ethical aspects of using AI tools. Students should actively engage with teachers and peers to foster collaborative learning and social skills. Combining AI-driven learning with traditional teaching methods can create a well-rounded educational experience. Sharing thoughts with classmates can also make the learning experience even better. Students should approach academics as a lifelong pursuit, welcome trials and doubts and proactively pursue continuous learning and personal growth. AI, by nature, lacks a human touch, and individuals may inherently feel less inclined to engage with technology compared to interacting with fellow humans. Consequently, people may perceive AI programs as impersonal, leading to resistance in collaborative efforts. Students should be educated about the ethical implications of AI. This means being aware of data privacy, bias, and transparency issues. By being aware of these ethical considerations, students can contribute to shaping a fair and inclusive technological landscape. While AI can enhance the learning experience, it should not replace human interaction entirely. Students should actively monitor their own learning pace while using the AI tools. They can assess the effectiveness of AI tools in meeting their educational goals and make adjustments as required. Regular evaluation and feedback can help students identify any shortcomings and make informed decisions about their learning approach.

The accessibility and inclusivity of ChatGPT in various languages and for non-English learners is crucial to avoid discrimination based on language proficiency. It is essential to ensure that ChatGPT accurately represents diverse human behaviors and thinking profiles, allowing individuals from all linguistic backgrounds to benefit from its intelligence.

V. SHAPING STUDENTS' FUTURE CAREERS

Although AI models have their own benefits and challenges, they can have a crucial impact on shaping students future career paths.

Students should actively engage with educators to grasp the strengths and weaknesses of AI models like ChatGPT. Collaborating with teachers can help students navigate the use of AI tools and ensure that they align with educational goals. With the rise of AI tools like ChatGPT, colleges and universities are reconstructing their courses and taking preventive measures to ensure proper academic integrity. As AI becomes more prevalent in education, students may need to develop new skills to effectively utilize AI tools. Additionally, the integration of AI models may create new job roles in the education sector, such as AI specialists and data analysts. With the revolution of the tech industry and artificial intelligence, job roles have been shifted and have made work life easier. Even though there is no certainty that artificial intelligence will take over human work, those with expertise in AI models and their effective utilization will play more significant roles in the industry. AI tools will support lifelong learning by providing adaptive learning pathways and up-to-date information. This will be crucial in a rapidly changing job market, helping students acquire the skills needed for the jobs of the future.

The utilization of ChatGPT has the potential to yield positive enhancements in student motivation. However, it is crucial to conduct long-term studies and make dedicated efforts to see how ChatGPT influences student's motivation, taking into account their learning styles and demographic characteristics. The utilization of ChatGPT has been demonstrated to enhance the generation of questions and banking processes.

In the end, platforms such as ChatGPT have the capacity to act as a bridge for creating a universal language and facilitating access to various perspectives and learning opportunities.

VI. CONCLUSION

In conclusion, AI tools like ChatGPT in education has undoubtedly marked a paradigm shift in the way students learn and engage with academic content. While the benefits, spanning personalized learning encounters, improved collaboration, and increased accessibility, underscore the vast potential of these technologies, it is crucial to acknowledge that, like any groundbreaking innovation, they come with challenges and ethical considerations demanding thoughtful consideration.

Although AI tools like ChatGPT provide significant help with tasks such as homework and essays, it's important for students to use them as extra aids to their education, not replacements for thinking and creativity. Finding a balance between using AI features and keeping a personal touch in learning is key. It is important for students to be aware of the

advantages and disadvantages of AI models like ChatGPT in education. By understanding ethical considerations, maintaining academic integrity, and actively participating in the learning process, students can make the most of AI technology while ensuring a balanced and effective educational journey.

In the face of swiftly evolving technologies, it is vital for us to stay receptive to new ideas and perspectives while staying dedicated to shaping a brighter future for everyone. AI has a powerful impact on education. By finding the right balance between technology and traditional teaching, we can create a future where AI enhances learning without losing the important human element. With careful consideration, students and AI working together can bring about a new era of creative and inclusive education.

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