

## Chatbots in Education: The impact of Artificial Intelligence based ChatGPT on Teachers and Students

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**Abstract** – The assimilation of artificial intelligence into education is an inevitable phenomenon. Intelligent tools provide opportunities such as personalized instruction, automated assessment and, last but not least, teaching with virtual assistants or chatbots. Chatbots and other virtual assistants have been on the market for years and have been used for educational purposes on various Q&A platforms. ChatGPT, however, can be considered as an intellectual revolution of chatbots that have been released so far. ChatGPT has taken the concept of artificial intelligence to a new level and it was inevitable that it would make its debut in education. However, in schools, this level and relative novelty can bring not only benefits but also dangers. In this article, we discuss the potential of ChatGPT in the educational process. We look at the impact it can have on students, pointing out both the positives and the negatives. We then look at the opportunities for teachers. Finally, conclusions are drawn and suggestions are made as to the aspects that teachers and students need to adhere to in order to effectively implement ChatGPT in their everyday education.

*Keywords – Artificial Intelligence, Education, Chatbots, ChatGPT, Future Education*

### I. INTRODUCTION

Chatbots are artificial intelligence (AI) based programs that can interact with humans. These intelligent systems can process incoming messages, interpret users' intentions and generate relevant responses. Chatbots are used across a wide range of platforms and applications, such as websites, mobile apps and social media platforms. These systems typically use native language processing algorithms and machine learning techniques to understand incoming text communication and generate meaningful and relevant responses.

Chatbots have many uses, such as customer service, virtual assistants and, last but not least, education. The launch of ChatGPT at the end of 2022 almost turned the world upside down and by now everyone has heard of this AI.

Lo's research, using the first quarter of the ChatGPT, concludes that immediate action is needed to update assessment methods and institutional policies in schools and universities. Training of teachers and education of students is also essential to respond to the impact of ChatGPT on the educational environment [1]. Tlili et al. examined the honesty and truthfulness of ChatGPT, privacy misrepresentation and manipulation. The

results of the study point to a number of research directions that should be considered to ensure the safe and responsible use of chatbots, especially ChatGPT, in education [2].

This article explores the role of chatbots and more specifically the potential of ChatGPT in education, looking at the opportunities and threats for students and teachers.

## II. CHATBOTS

Artificial intelligence has a broad impact on education and is the subject of numerous studies [3], [4]. By the most significant areas we mean personalized learning, prediction following data analysis, automated assessment and the real-time communicating chatbots discussed in this article.

Chatbots are artificial intelligence-based systems that can communicate and respond to users' questions or instructions. People can communicate with chatbots through websites, apps, social media platforms or even voice interfaces.

From an educational point of view, chatbots can answer students' questions, provide them with help and general information immediately following the condition of the question. This is very different from a Q&A forum, where it can take hours for the person asking the question to get an answer. Virtual assistants can be used as virtual teachers in the field of education. They can engage in conversation and interaction with the user, similar to a real teaching environment, with the advantage of being able to access content available on the network to generate answers and solve questions on various topics related to the subject [5].

Attempts to develop chatbots have been made before. [6], [7]. Sandu's survey of higher education in India showed that as early as 2020, nearly half of students use chatbots to communicate with their educational institution, and identified Chatbot as the fastest communication tool [8].

Many leading mobile phone manufacturers have their own voice-activated virtual assistants, which users prefer to configure to perform certain functions more conveniently. Here are some of the more relevant examples:

- **Siri:** a virtual assistant developed by Apple that runs on the iOS operating system. Siri helps users search for information, send messages, manage calendars, view weather reports and perform other tasks for users.

- **Alexa:** is a chatbot for Amazon Echo smart speakers that can interpret and respond to voice commands. Alexa helps with home automation, music playback, information search and more.
- **Google Assistant:** a virtual assistant developed by Google that can respond to users' questions and instructions. Google Assistant helps with search, calendar management, navigation, translation and other activities.
- **Xiaoice:** a popular Chinese chatbot developed by Microsoft. Xiaoice is an emotionally intelligent chatbot that can interpret and respond to human emotions and is able to engage in longer conversations with users

Already in 2018, the results of Roos's work suggested that chatbots in education have a wide range of uses and even more potential functions [9]. But the release of ChatGPT has taken our understanding of chatbots and artificial intelligence to a whole new level. ChatGPT is an AI-based language model developed by OpenAI. GPT stands for Generative Pre-trained Transformer, which is a deep learning model. The chatbot ensures multilingual communication. Through data analysis and modelling, it can understand questions, generate instructions and answers, and learn from incorrect answers. It is clear that ChatGPT has huge potential for education. However, it is important to exploit it within a reasonable framework. Especially for the students, because what they perceive as a positive first impression can easily produce negative results.

## III. THE POTENTIAL OF CHATGPT IN EDUCATION

There are two general aspects to this analysis. The first is the impact on students. The second is the impact on the work of teachers. From this results, we should draw conclusions about the aspects that should be taken into account by instructors when teaching with AI-based systems, in our case chatbots.

### *Impact on students*

- **Interactive learning:** ChatGPT enables interactive learning and question-and-answer based communication. Students can ask ChatGPT questions and ChatGPT can answer them, helping them to extend their knowledge and understanding of the material. This form of education gives students the opportunity to

interact directly with an intelligent system and receive support in their learning process.

- **Personalized help:** ChatGPT can provide personalized help to students. Students can focus on specific questions and problems and ChatGPT can provide different answers and explanations. This allows students to get personalized support for their learning, even if they do not have immediate access to teachers or other tutors.
- **Fast and available help:** ChatGPT is always available and can quickly answer students' questions and problems. This can help students get immediate help when they need it, even if the time or situation does not allow for immediate human assistance. However, this also implies that students do not use ChatGPT to its full potential and focus on the short-term benefits of completing tasks quickly rather than what it can do [10]. ChatGPT can also provide support for students who have limited access to educational resources.
- **Language learning:** ChatGPT can also be useful for language learning. Through interactive communication, students can practice the target language and ChatGPT can improve their grammar and language skills. ChatGPT can chat with students and answer their questions about language learning, providing an interactive and dynamic language learning experience. The work of Kohnke et al. provides some initial ideas on how ChatGPT can support language teaching and learning [11].
- **Incomplete or incorrect information:** when communicating with ChatGPT, it is possible that the responses generated may contain incomplete or incorrect information. This can be a particular problem if students are unable to identify or correct these mistakes. Receiving misinterpreted or incorrect information can mislead students and lead to incorrect knowledge. Consequently, if chatbots do not understand users' requests, they can also cause frustration resulting from failed communication [12].
- **Dependence on AI systems:** students may tend to rely too much on AI systems such as ChatGPT and may lose critical thinking or independent problem-solving skills. This dependence is not conducive to students'

independent learning and development and may hinder their personal development in the long term. Iskender's research has also shown that overuse of ChatGPT risks reducing students' critical thinking and educational inequalities [13]. This claim was made by ChatGPT itself.

- **Lack of personal contact:** communication with AI systems may lack an element of human interaction and personal contact. Interaction with instructors and peers in education is important to the learning process. AI systems fail to create a personal connection that includes emotional support and collaboration.
- **Privacy and security:** AI systems, such as ChatGPT, may collect and store data when communicating with students. It is important that privacy and security issues are properly addressed to ensure that student data is protected and does not fall into unauthorized hands.

#### *Impact on teachers*

- **Support materials and resources:** ChatGPT can help teachers to produce support materials and resources. ChatGPT can be used by teachers to generate supplementary materials, examples or exercises to support the curriculum. This can provide students with richer and more varied content.
- **Generate tests and assignments:** ChatGPT can help teachers create tests, assignments and homework. Teachers can generate questions using ChatGPT and the system can provide answers for students. This can test students' knowledge and help teachers monitor students' progress.
- **Research tool:** ChatGPT can be a useful research tool for teachers. Teachers can use ChatGPT to ask questions about research topics or teaching issues and the system can provide extensive information. This can help teachers to expand their own knowledge and continuously improve their teaching.

#### *Considerations*

- **Critical thinking and interpretation:** teachers and students should be critical of the content generated by AI systems. It is important that they recognize the limitations

and consider that AI systems may contain errors and shortcomings. Teachers should be actively involved in monitoring and interpreting content.

- **Supervision and management:** teachers must supervise the use of the AI systems. It is important that they control the content generated and ensure its accuracy and reliability. Teachers should guide students in the correct use and help them understand the limitations of the AI systems.
- **Support and leadership:** teachers continue to play their support and leadership role in interacting with students. In addition to using AI systems, teachers continue to support student progress, guide learning and provide feedback and assessment.
- **Emotional support and personal interaction:** AI systems are not a substitute for human contact and emotional support. Teachers need to ensure that personal interaction and the emotional needs of students are met. In addition to the use of AI systems, teachers should create a personal connection and a collaborative learning environment.

Farrokhnia et al. conducted a SWOT analysis of ChatGPT to outline its strengths and weaknesses. The survey also clearly showed that ChatGPT's strengths include the use of a sophisticated natural language model to generate believable responses, the ability to self-improve, and the ability to provide personalized and real-time responses. Weaknesses included lack of deep understanding, difficulty in assessing the quality of responses, risk of bias and discrimination, and lack of higher-order thinking skills [14].

Chatbots, as we can see, have many advantages, but also many dangers. According to some researchers, chatbots are more suited to providing additional information than to resolving content issues [12].

Negative effects do not necessarily apply to all students, and their likelihood may vary depending on the specific circumstances and the way they are used. Educational institutions and teachers should ensure that AI systems are used in a correct and responsible way, and provide appropriate guidance, support and training to students to help them understand the limitations of AI and how to correctly interpret the responses generated.

To minimize the negative effects, it is important to combine human and AI-based education and to develop critical thinking, problem solving and social interaction in students. Teachers should be actively involved in the process, monitoring the functioning of the AI systems and helping students to use them correctly.

Overall, AI systems such as ChatGPT present both potential benefits and challenges for education. Proper planning, preparation and supervision can help to ensure that AI systems have a positive impact on students and contribute to improving the educational process.

#### IV. CONCLUSION

As we can see, chatbots have many advantages but also limitations and challenges. They are not a full replacement for human emotional support and interactive learning. In addition, chatbots need the right data and the right algorithms to provide reliable answers. The use of chatbots in education has great potential, but responsible design and implementation is essential. Teachers and educational institutions should ensure that chatbots are used correctly so that students are supported in their learning and development.

The future of education is therefore moving in a direction where technology and human interaction complement each other to enhance learning and student development. As AI and chatbots create new opportunities for personalized learning, interactive learning and improving the efficiency of the educational process, teachers should strive not to displace but to implement these technologies appropriately.

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