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USE OF ARTIFICIAL INTELLIGENCE AS AN ELEMENT OF STUDENT'S COGNITIVE ACTIVITY ACTIVATION DURING THE LECTURE
(from the experience of online teaching of the Basics of Scientific Research and Heat Engineering disciplines)

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In the last few years, the number of publications (both scientific and journalistic) related to the development and applications of artificial intelligence (AI) has grown exponentially, especially after the general public was given free access to the famous ChatGPT from one of the leading developers of such products - the company Open AI. As noted by the Swissinfo.ch portal, on March 29, 2023, approximately one thousand high-tech experts appealed to companies and governments around the world to freeze the development of this AI format for six

months, citing "serious risks to humanity". Among them were Steve Wozniak, one of the founders of Apple, and even Elon Musk, one of the investors of OpenAI. Literally three days later, Italy decided to block access to the chatbot site, on March 27, 2023, Europol, the European criminal police agency, in its report expressed concern about the possible use of the potential of ChatGPT by cybercriminals, and in Russia, due to its aggression, ChatGPT is basically unavailable [1].

But the rhetorical question: - Is the devil really as scary as he is portrayed? The answer to the question "What is ChatGPT?" from the "first person" (ChatGPT itself) is shown in fig. 1.

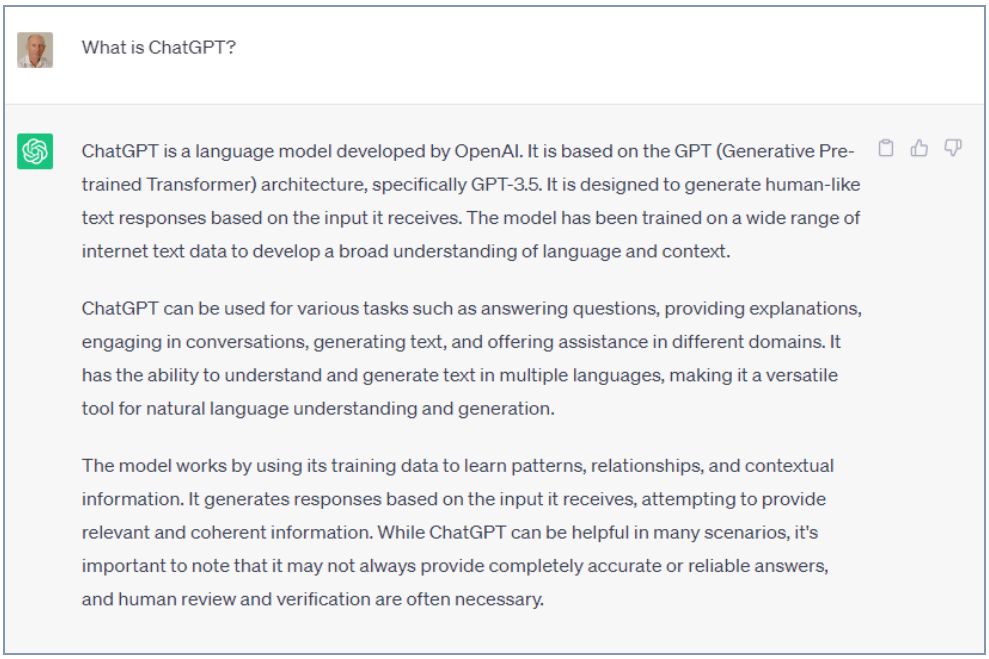

Fig. 1. The answer generated by the ChatGPT AI in response to a question posed to it [2]

As noted in the material on the website of one of the popular Internet projects, ChatGPT recently passed the exam for obtaining a medical license in the USA. He also interviewed at Google for the position of junior software engineer and passed the university's intermediate level business administration exam. With the help of AI, judges are already making decisions on real cases, and media companies are using chatbots to write materials [3]. And this is only a small part of the examples of what AI systems can actually do... Yes, on the website of the same project, with reference to the speech of Microsoft co-founder Bill Gates, it was noted that such services as ChatGPT from OpenAI and Bard from Google will significantly improve children's education in 18 months, replacing teachers. At the same time, popular global Internet resources one after another publish the sensational news that the AI image won the prestigious Sony World Photography Award international photo competition in the "creative" category and only thanks to the sincere confession of the photo artist Boris Eldgasen about the "co-author" of the work the competition jury learned the details of this miracle (fig. 2).

Fig. 2. Could you tell this is not a real photograph? [4]

The given examples allow a better understanding of the basis for the fears that gripped a large part of the expert environment with the emergence of AI, but ... But at the same time, many researchers and scientists are ardent supporters of AI-based systems, including those that can be used in the education of children and adults, allowing to reduce efforts on routine work and focusing on what teachers usually do not have enough time for and what no one can do better than a teacher. Thus, educators from Sumy State University believe that artificial intelligence should be made a supplement to educational materials developed by the teacher, it can be used in the educational process as a teacher's assistant, in addition to its use to create a personalized learning environment and provide feedback to students. But at the same time, attention is also paid to the risks that may be caused by the use of artificial intelligence in education: the reduction of the role of the teacher, the reduction of creativity and critical thinking skills of students, the risk of increasing the gap between students with high and low socio-economic status [5].

One of the obvious risks is the possibility with the help of AI to "softly" violate the rules of academic integrity, passing off, for example, a compile from ChatGPT (or another similar system) as one's own intellectual work. Thomas Garbelotti, in his blog on the UCLA Humanities Portal [6], notes that concerns about academic integrity and equal access are not new. What makes them new is that artificial intelligence simply exponentially accelerates and enhances their appearance. For example, you can spend time searching for information in printed resources, or you can simply copy the text with minor changes to avoid originality checks. But the same printed resource can also provide incorrect information - just because it's printed on paper doesn't make it correct by default.

The authors from the Vinnytsia Pedagogical University believe [7] that one of the potential directions of using AI as a teacher's assistant is the selection of educational material that is optimal for the appropriate audience, the curriculum of the course, interesting and useful for the future profession. Mobile applications are gaining relevance, which are used: as assistants in studying educational material and its consolidation; as an analyst in the process of gathering information during exercises in solving issues that cause certain difficulties, errors and significant time consumption. The same authors consider the use of chatbots promising, which can be used as tools to

support online learning. Many other educators also speak about the advantages of using chatbots with artificial intelligence. But it is also noted that the creation of a chatbot involves a significant contribution of human efforts at all stages of its development, in particular at the stage of teaching the bot to understand the context of user appeals (~26% of the time) and building a dialogue model (16%) [8].

Very interesting and useful in the author's opinion is a selection of ChatGPT requests from Andrew Gerft, which was translated into Ukrainian by the trustees of the "New Ukrainian School" website from the author's Facebook page [9]. These tips for teachers' use of ChatGPT are divided by the author into seven large groups according to the teacher's activities, and in each of them you can find some that are worth trying before using. Equally interesting are the thoughts and experience of Jackie Gerstein [10], who notes several potential ways of using ChatGPT or similar language models in education:

- As a tutor or teaching assistant: ChatGPT could be used to provide personalized feedback and guidance to students, answering questions and providing explanations on a variety of educational topics.
- For language learning: ChatGPT or similar models could be used to provide conversation practice and feedback to students learning a new language.
- To generate personalized learning content: ChatGPT or similar models could be used to generate customized learning materials for students, such as practice problems or reading assignments.
- To facilitate collaborative learning: ChatGPT or similar models could be used to facilitate discussions and collaboration among students, providing prompts and guidance for group projects and assignments.

The same resource schematically shows possible ways of using ChatGPT in the classroom (Fig. 3).

Fig. 3. 20 ways to use ChatGPT in the classroom [10]

There are many more examples and recommendations for the use of AI in education, such as numerical tips and hints from MERCER University [11] and many others.

Own practical experience

At the beginning of 2023, during an online session on the ZOOM platform, I invited my students to familiarize themselves with publications on the use of the ChatGPT AI system and register at the appropriate address [2] for further use. Several students then stated that they were already using ChatGPT, which I was not so much surprised by, but pleased about. When I clarified the purpose of using AI, the students answered that it is "faster and easier" than searching on Google. Such a response strengthened the confidence that these students can (and most likely do!) use ChatGPT for their written work (e.g., essays, tests, etc.). Since that time, ChatGPT has become a regular "visitor" of my lectures, which I conducted in ZOOM for students in the disciplines "Fundamentals of scientific research", "Heat engineering" and others. And not just a visitor, but a third-party "expert" on issues, the clarification of which required additional time spent by the students.

The scheme of using ChatGPT during lectures was quite simple. Having turned on the demonstration of my own screen in ZOOM, I brought up the ChatGPT interface on the screen and began to ask him questions that needed clarification. The answers that the "expert" gave (quite quickly!) were watched by the students online on the screen, where they remained. Then on my part, I provided one or another explanation (if the topic of the lecture was new) or (if the material that had already been studied was repeated) the students were asked the question: - What is wrong with this answer? Since not all of the AI's answers to technical questions were thorough and comprehensive, I had many opportunities to highlight to the students the mistakes that ChatGPT made and gradually build in them a strong understanding that AI cannot be completely trusted in technical matters. This was also helped by the fact that in the dialogue with ChatGPT I pointed out his mistakes and he apologized for the inaccurate or erroneous answers given. Unfortunately, I would not like to show screenshots of those dialogues, so as not to discredit the product (AI) and its developers, because ChatGPT is only a language model that relies on the information available to it and the "thinking" algorithms with which it was equipped and which constantly improve It should be noted that this is quite a powerful product (!), which was shown in the review at the beginning.

But even such a primitive way of using ChatGPT allowed the author to significantly revive the cognitive activity of students and their interest in the material of lectures, which with certain training (here we are talking about training the lecturer, not AI) can be much more effective from the point of view of achieving the desired learning results.

Conclusions

The use of AI systems such as ChatGPT in the educational process can be very useful in modernizing didactics and learning design and should become a daily practice in the educational process. In this case, the further improvement of AI will encourage the improvement of the educational process, adjusting its emphasis taking into account new opportunities.

It is important to remember that the use of AI by teachers and students is just another "step" in the evolution of learning tools (think logarithmic rulers, calculators, laptops, smartphones, spell checkers, translation programs, etc.) and are in fact only more advanced tools , corresponding to the current level of human progress.

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*[1] - the free version of ChatGPT currently available in Ukraine is version 3.5, although certain categories of users have already been granted access to use version 4.0

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ОХОРОНА ПРАЦІ, ЕКОЛОГІЯ ТА БЕЗПЕКА ЖИТТЄДІЯЛЬНОСТІ ЯК ВАЖЛИВІ ОСВІТНІ КОМПОНЕНТИ ОСВІТНЬО-ПРОФЕСІЙНИХ ПРОГРАМ ПІДГОТОВКИ ФАХІВЦІВ

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Промислово-економічний потенціал України формують декілька галузей, зокрема – гірничо-видобувні та металургійні підприємства. За даними українських профспілок за підсумками 2019 р. гірничо-металургійна галузь забезпечувала близько 26% валютних надходжень, 12% ВВП, понад 30 млрд грн відрахувань до бюджетів всіх рівнів та понад 600 тис. робочих місць (з урахуванням суміжних галузей) [1]. За даними Worldsteel Association у період 2018…2021 рр., до початку воєнної агресії, загальний обсяг виплавки сталі (т.з. *crude steel*) в Україні складав понад 21 млн. т, а країна з цим показником входила до першої двадцятки виробників сталі в світі*[2].

Дніпропетровщина є одним з найбільш потужних промислових регіонів України, де значна частка валового продукту припадає на підприємства гірничо-металургійного комплексу. За даними деяких авторів [3], мінерально-сировинна база області на 29,5 % складається з паливно-енергетичних

*[2] - *crude steel* - з англ. «сира» (необроблена) сталь. У 2022 році обсяг виробництва сталі в Україні через збройну агресію з анексією частини територій та захопленням і руйнацією металургійних підприємств у м. Маріуполь впав у 3,4 рази - до 6,26 млн. т (з 21,37 млн. т у 2021 р.), а країна опустилася в світовому рейтингу виробників сталі з 18-го на 29 (!) місце.