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ARTIFICIAL INTELLIGENCE IN HISTORY EDUCATION: OBSERVATIONS AND PERSPECTIVES

The article presents the results of cursory field research and the author's own experience of using of public chatbots based on artificial intelligence in history education, mainly during the course «The Actual Issues of History and Culture of Ukraine». The author discusses the most typical examples of student responses generated by these chatbots and attempts to identify the key indicators of such a violation of academic honesty.

The results of the author's own experiments conducted during communication with ChatGPT and Bard on topics related to the history of the Ukrainian Cossacks are presented. The current state of identification of artificial intelligence-generated text by plagiarism checking systems and the ability of chatbots to effectively rewrite academic texts is shown. The author presents the threats of using these tools in test tasks and suggests an effective way to eliminate them. The main advantages, current and future, of using public chatbots in history education are described, as well as ways to explain to students and teaching staff of higher education institutions the great danger of such academic dishonest behavior.

Keywords: chatbot, artificial intelligence, ChatGPT, history education, threats to the educational system.

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ШТУЧНИЙ ІНТЕЛЕКТ В ІСТОРИЧНІЙ ОСВІТІ: СПОСТЕРЕЖЕННЯ ТА ПЕРСПЕКТИВИ

Загальнодоступні чат-боти на базі штучного інтелекту (ШІ) швидко стають невід'ємною частиною нашого життя. Це програмні середовища, які базуються на результатах роботи нейронних мереж з величезними масивами передусім текстових даних, що враховують специфіку природних людських мов, можуть сприймати текст, введений користувачем, і генерувати текстові відповіді. Наразі існують десятки популярних чат-ботів, серед яких найбільш відомі ChatGPT, Bing, Claude і Bard.

Автор публікації вже понад рік ретельно вивчає їх для особистих потреб та спостерігає за стрімким проникненням цих систем ШІ в освітній процес. За останні два навчальні семестри застосування студентами таких чат-ботів стало надзвичайно поширеним, хоч здійснюється переважно з грубим порушенням академічної доброчесності. Текст, який повинен забезпечити відповідь на різні питання з історії, генерується чат-ботами феноменально швидко, але загалом він настільки ж феноменально далекий від очікувань.

Можна виділити кілька специфічних індикаторів, котрі вказують на таке порушення доброчесності: перефразування, абсолютна узагальненість, позбавленість будь-яких важливих фактів і дат, абсурдність тверджень та кардинальне перебільшення важливості історичних проблем, подій та осіб, змішування фактологічного матеріалу з різних епох, історії різних держав і народів.

Великою проблемою видається переписування тексту (рерайтинг), з яким чат-боти добре дають собі раду і який наявні системи перевірки плагіату не в стані ідентифікувати.

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Стосовно тестових завдань, зважаючи на їх переважну простоту і орієнтованість на перевірку певних усталених фактів, чат-боти «забезпечують» навіть до 90% правильних відповідей. Технічним рішенням у цій ситуації можуть бути спеціальні плагіни для обмеження переходу між вкладками браузера, хоч вони платні й незручні у використанні.

Єдиним дієвим способом відновити академічну добросовісність видається спрямування освітян-істориків – не толерувати подібне застосування цих систем, ретельно пояснювати студентам їх шкідливість для сфери історичної освіти.

Чат-боти на базі ШІ навряд чи будуть колись заборонені або ліквідовані. Потрібно змиритися з тим, що вони існують, і пристосуватися до того, як вони працюють. Це справді проривні технології, котрі можуть якісно покращити історичну освіту в майбутньому, однак, на жаль, не в теперішньому.

Ключові слова: чат-бот, штучний інтелект, ChatGPT, історична освіта, загрози освітній системі.

Introduction

New phenomena such as ChatGPT are rapidly becoming an integral part of our daily lives: they are in the news, they are admired, they are hated, and sometimes they are compared to the most breakthrough technologies in human history. What do they mean for history education today?

The **actuality** of the topic of our publication is extremely important, as it concerns almost all elements and stages of history education. The main **goal** of the article is to present the peculiarities of practical use of AI-based chatbots by students in the study of historical disciplines. The **tasks** of the publication are to analyze the peculiarities of generating texts on topics related to historical disciplines by public AI-based chatbots, to identify indicators of such texts, and to suggest ways to eliminate or at least reduce the threat to the entire history education.

The state of research on the topic. Given that this is a very new field of research, the role of AI in history education (including chatbots based on it) remains very poorly developed. Among Ukrainian researchers, both educators and journalists, we can mention the studios of Oleksii Voronkin, Liliia Vitiuk, Tetiana Lebid, Oleksandr Okhrimenko, and foreign researchers Kevin Roose and Marcin Frąckiewicz. When studying these publications, we almost always notice enthusiasm, recommendations to use ChatGPT and its analogues as widely as possible, to adapt to the new conditions in which the educational process appears¹. Only here and there are timid remarks about the imperfections of public chatbots and the risks associated with them.

AI-based chatbots: the principle of functioning and the most popular models

A public chatbot based on AI is a software environment built on AI systems that is created to interact with humans via natural languages. It is public because it is available to the widest range of users through the web pages, messenger platforms, and voice assistants.

Each such system is based on neural networks that are trained on huge amounts of text data, hundreds of billions of words, on the so-called principle of large language models (LLM). According to certain algorithms, text is converted into tokens, and words are encoded based on the patterns of a particular language. Next, neural networks, trained based on specific tasks, create certain software models that recognize natural human speech and generate human-like text in response.

The most famous is ChatGPT by OpenAI company. It's followed by Bing, Claude, and dozens of others. One of the latest is Bard by Google. Each of these chatbots has its own features. Besides the popularity ChatGPT is much slower than Bard in text generation speed. Its free version is still inferior to most other popular chatbots as it still doesn't have access to web searching systems.

ChatGPT has been available in Ukraine since the beginning of this year. Students (and not only them) started using it for various purposes quite quickly. The easiest and the least honest way is to quickly complete a homework.

It's very fast method. All you have to do is enter a prompt, and the chatbot gives you a comprehensive answer, grammatically mostly correct, formulated mostly flawlessly or with minor errors.

My first acquaintance with it. First (mis)use by students

Ever since I got acquainted with AI systems myself, I've been trying to communicate with them on historical topics. A year ago, when even they weren't available in Ukraine and I had to use them through

VPN services, I was shocked by the complete absurdity of the historical text they generated, even on the simplest issues. That's why, in the first classes of my subjects in summer semester 2022/2023 and in winter semester 2023/2024 academic years, I warned students about using AI chatbots.

The main course that I teach at Yuriy Fedkovych Chernivtsi National University is «The Actual Issues of History and Culture of Ukraine», which is intended for students of non-specialists, i.e., non-historians. I had classes at the Faculty of Law and the Faculty of Pedagogy, Psychology, and Social Work of our university.

Last semester it wasn't widespread, but this semester it is very, very noticeable. And at one of the most prestigious faculties of the university, the Faculty of Law. In almost every academic group, during seminars on this course, there have been cases of using public chatbots to generate material to answer seminar questions.

First of all, let me briefly explain what the seminar looks like. There are usually three questions per lesson (for example, the first is «Kyivan Rus under Volodymyr the Great», the second is «Causes and process of division of Kyivan Rus», and the third is «Tatar-Mongol invasion and the death of Kyivan Rus»), each of which is reported first by one speaker from students' group and then discussed by his/her colleagues.

So, very often, a student called to give a report, steps into the center of the auditorium, takes out his (or her) smartphone, quickly enters a request, copying it from an electronic journal, and starts reading what the chatbot has generated. It looks comical at first, and tragic a bit later.

Indications of (mis)using the chatbots in open-ended responses

The following indicators can be defined:

1. Paraphrasing.

The chatbot always paraphrases the wording of the question in the first few sentences. For example, if the question is phrased «The Tatar-Mongol invasion and the death of Kyivan Rus», it generates something like: «At a certain period of the history of Kyivan Rus, this state experienced a phenomenon called the Tatar-Mongol invasion, which led to the death of Kyivan Rus». At first glance, it looks like a human «stretching» the answer, but humans use this quite rarely, while chatbots use it all the time.

2. Generality and lack of details, dates, and facts.

At the beginning of my communicating with such chatbots (at least in early 2023), they were rapidly generating facts and dates with absolutely no sense, missing by centuries.

Perhaps their developers realized that, and now chatbots are more cunning, they can tell that the Tatar-Mongol invasion was (dividing the answer into informative blocks):

- a terrible phenomenon,
- had a great impact on Kyivan Rus,
- led to changes in the life of the population,
- violated the principles of freedom and democracy (that's not a joke),
- took place at the end of the existence of Kyivan Rus, and so on.

That all goes without any specific date, name of a prince or khan, etc. Such generalized answers without facts are indicative of texts generated by AI.

3. Absurdity of information and exaggeration of the importance of problems and persons.

If you ask a chatbot about some of the most famous figures or phenomena in the history of Ukraine, it can give you several real facts about these figures/phenomena and a few fake ones. This was very vividly demonstrated, for example, in short biography of Oles Honchar generated by ChatGPT and published recently by the Novyi Kanal, which caused a true scandal in the Ukrainian information space².

Some students use a combined approach, using both AI systems and recommended literature, which is provided for each topic and is fully online. The transition from the material from a real book or article to the text generated by chatbot is very noticeable, because currently, AI doesn't distinguish between fact and fiction at all³.

Another real-life and shining example

In a lesson about the system of government of Bohdan Khmelnytsky's state, one student gave the following information (first, I will give the correct answer for the uninitiated: the head of the state was hetman Khmelnytsky himself, who relied on the General Council of starshyna, i.e., senior officers, Cossack regiments and regions were led by colonels, hundreds by sotnyky, the commanders of hundreds; these facts generally exhaust the answer).

In the version of an unidentified chatbot (since students rarely name which ones they use, although as was noticed from casual observations that it's almost always ChatGPT), it was declared that the main authority in Khmelnytsky's state was some «rada riasna», which performed seemingly fantastically important functions and was the best manifestation of freedom and democracy in the world ever. No less important in the chatbot and student's version was the «hetman's дума» (let me remind that the дума was a kind of parliament in the Moscow Tsardom), as well as the «Cossack sejm» (sejm was the parliament of the Polish-Lithuanian Commonwealth at that time).

As we can see, the chatbot mixed different topics and historical periods. I still don't identify where it got the «rada riasna» from.

Finally, the chatbot came up with two Zaporozhian Hosts, the Upper and Lower, which fought each other for a long time, but at last their leaders reconciled and began to live in peace and harmony. The end.

My own experiments with chatbots

When it goes about lesser-known figures in the history of Ukraine, chatbots just go for cosmic fantasizing. Marko Zhmailo, a Cossack hetman in 1625, in one case they may consider to be a Ukrainian writer of the 19th century, who was, according to both, ChatGPT and Bard, one of the most prominent Ukrainian writers of the 19th century, in other cases a participant in the Euromaidan, one of the most outstanding participants in the Euromaidan, in other cases a famous dissident, very bright sixtiers activist, a great volunteer, etc.

I asked about several well-known Cossack hetmans. All generations of chatbots ended with a conclusion like: that person played an exceptionally important role in the history of the epoch, that was a fighter for the freedom and independence of Ukraine (although it's often a lie), the memory of him still lives on among the people (despite the fact that it's mostly a lie).

Plagiarism and rewriting

All of these circumstances also raise the obvious question of checking text generated by AI systems for plagiarism. Technically, this is mostly a new text that doesn't repeat texts present in the databases. This has become a certain problem, but now effective tools for identifying such text have been developed and are currently being implemented in various plagiarism checking systems (I hope so).

The situation with rewriting is quite different. Previously, rewriting was performed manually or with paid services that worked in a semi-automatic mode, but now any popular chatbot can handle rewriting and does it so successfully that one of the best plagiarism checkers in Ukraine, Unicheck, cannot detect such activity and treats the text rewritten by the chatbot as original. As my colleagues and I sadly joke, it will soon be possible to rewrite in this way any existing publication and present it as authentic and new one. But that may be the subject of another paper.

Popular chatbots and quizzes

In my practice, it also happened that artificial intelligence (AI) systems were used to perform tests. Student sometimes «completes» quizzes by copying them into chatbots. These can be just single questions or whole sets. And it gave from 40 up to 80–90% of correct answers. A big blow to the traditional knowledge testing system, right?

Nowadays, there are technical ways to prevent this, such as special plugins that control the transitions between browser tabs. For example, I prepare tests based on Google Forms, and this plugin detects whether students stay on the active browser tab (the one with the test) or switch to other tabs. Unfortunately, all of these plugins are paid, and I can't afford to use them on my teacher's salary.

Another limitation in using such plugins is that they are not suitable for all operating systems, they are developed mainly for Windows and popular browsers like Chrome. It means that these plugins don't work for students who take tests on iOS and less popular browsers.

A quite easy solution, in our opinion, would be to create a universal free online platform with similar functions, i.e., the inability to switch to other tabs during the test or to record such switches. Another good option would be to make it impossible to copy text from such a web page.

The best way to restore academic honesty

Given their convenience, public chatbots are unlikely to be successfully banned or liquidated. We need to accept the fact that they will continue to exist, and adapt to the way they work. What are the ways to avoid the unfair use of such chatbots in history teaching?

The only way, in my opinion, is the involvement of teachers. Once, when I abruptly stopped a student's report based on an absurd text generated by AI, that student was even offended and said that such tricks he used in other lessons of the law subjects. Therefore, in my opinion, the involvement by the teaching staff is the key way to stop the mass use of such absurd texts.

The best result can be given by the explanation, with multiple repeating, of the huge flaws in the work of AI in generating history-related texts. Human psychology works like this: you need to repeat a lot to get it understood.

Also, a certain temporary solution may be to return to such forms and methods of classroom work and knowledge testing as oral examinations.

Can these chatbots be of any use?

Speaking about the huge number of disadvantages and inconveniences of using public chatbots based on AI today, I don't deny their huge and potentially breakthrough role in the educational process of the future, including the study of historical disciplines. The forms and scope of such application can be limited only by human imagination.

In my own practice, I widely use public chatbots for historical research, they save a lot of time in processing technical data related to source documents, they are suitable for performing certain processes in genealogical research, etc. In terms of history education, considering the features that appear in new versions of chatbots, such as image generation, image analysis, audio recognition, etc. The need for their use will only grow.

Some enthusiasts are trying to use these chatbots to turn history education into a game, to gamify the lessons. So far, these attempts have been unsuccessful and sometimes very funny⁴.

With the increasing speed and depth of AI data processing, there will be for sure less and less absurdity in the perception and coverage of the historical process by such chatbots (or at least I want to believe). I also have no doubt that very soon the sphere of their use will move into virtual reality. Only time will tell what forms it will take and how it will be used by educators.

In my subjective opinion, there are certain areas of science and education where the use of such systems is fully justified, such as engineering, IT, wherever specific operations related to direct interaction with machines, programs, etc. need to be applied. But for history education, at the moment, I see only one clear advantage of using public chatbots – correcting spelling mistakes for Ukrainian text. AI systems do a good job with this.

Conclusions

Currently, there is no AI-based chatbot that can replace the engagement of students in searching for and processing materials on historical topics in higher education. The misuse of such tools is very noticeable in the presence of a human specialist.

Public chatbots do much more harm than good in studying history. It seems very strange to me that some colleagues are calling for making the work easier by asking ChatGPT to write tests for them, model historical situations, etc. At present, public chatbots are so imperfect in this regard that every statement and fact they provide needs to be verified, and this verification sometimes requires much more time than creating tests or scenarios from history by ourselves.

In my opinion, the most brief and accurate description of the role and capabilities of AI in history education is in the following quote by Ian Bogost: «The AI doesn't understand or even compose text. It offers a way to probe text, to play with text, to mold and shape an infinity of prose across a huge variety of domains, including literature and science and shitposting, into structures in which further questions can be asked and, on occasion, answered»⁵.

The threat from such chatbots is generally underestimated and will only increase. Reducing this threat poses a serious challenge to modern history education. Only time will tell what AI chatbots' dominance will lead to in the future. If this (mis)use of them meets with apathy from teachers, our educational system, and not just history education, will face further downfall and very difficult times.

¹ For example: K. Roose, *Don't Ban ChatGPT in Schools. Teach With It*, URL: <https://www.nytimes.com/2023/01/12/technology/chatgpt-schools-teachers.html>

² П. Горлач, «Довіряй, але перевіряй»: як відреагували на поширення фейкової біографії Олесь Гончара, створеної ChatGPT, URL: <https://suspilne.media/culture/435771-doviraj-ale-pereviraj-ak-vidreaguvali-na-posirennja-fejkovoi-biografii-olesa-goncara-stvorenoi-chatgpt/>

³ M. Duszczuk, *ChatGPT może zniszczyć Wikipedię. Halucynacje i zalew fałszywych historii*, URL: <https://cyfrowa.rp.pl/technologie/art38428041-chatgpt-moze-zniszczyc-wikipedie-halucynacje-i-zalew-falszywych-historii>

⁴ *The Not-So-Accurate-History of France by ChatGPT*, URL: <https://www.thefrenchhistorypodcast.com/the-not-so-accurate-history-of-france-by-chatgpt/>

⁵ I. Bogost, *ChatGPT Is Dumber Than You Think*, URL: <https://www.theatlantic.com/technology/archive/2022/12/chatgpt-openai-artificial-intelligence-writing-ethics/672386/>

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