



AI tools for science: basic classification, strengths, weaknesses, learners' opinions

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Abstract

Importance. Training personnel for careers in science and the economy requires modern research competencies in the scientific and technological sphere, including mastery of AI technologies. This paper aims to develop a basic classification of AI tools applicable to undergraduate, graduate and postgraduate students of the humanities, and to analyse students' subjective opinions about the effectiveness, strengths and weaknesses of using AI in science.

Research Methods. The following scientific methods are employed: analysis of relevant literature; a training experiment; a formalised questionnaire; and statistical methods.

Results and Discussion. The research revealed that undergraduate students utilise AI to structure information (73.9 %), write conclusions (78.3 %), write a literature review (60.9 %), and generate ideas (52.2 %). Masters and PhD students use AI to design articles and reference lists (73.9 %). In the survey, respondents identified ChatGPT ($\bar{x} = 8.5$ and 8.2 points), DeepSeek ($\bar{x} = 8.2$ and 7.7 points) and Chatpdf ($\bar{x} = 7$ and 7.7 points) as the most effective resources. Master's and PhD students demonstrated a heightened level of critical thinking when evaluating the strengths and weaknesses of AI tools. They were more likely to identify potential limitations.

Conclusion. The differences between Masters' degree Students/Post-Graduate Students in the choice of AI resources and in the assessment of their advantages and disadvantages are due to the different levels of their research competence and the degree of readiness for independent scientific activity.. The application of AI can facilitate students in solving a number of tasks, but only qualified teachers are able to supervise their research and inform them of the correct and incorrect ways to use AI in science.

Keywords: AI tools in science, humanities research, classification of AI for research, university, learner' opinion, advantages, disadvantages

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Инструменты искусственного интеллекта для научных целей: базовая классификация, сильные и слабые стороны, мнение обучающихся

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Аннотация

Актуальность. Подготовка кадров для науки и экономики требует наличия современных исследовательских компетенций в научно-технологической сфере, в том числе владение ИИ-технологиями. Цель исследования – разработать базовую классификацию инструментов ИИ, применимых в исследованиях бакалавров, магистрантов и аспирантов гуманитарного профиля, а также проанализировать субъективные мнения обучающихся об эффективности, сильных и слабых сторонах использования ИИ в науке.

Методы исследования. Применялись следующие научные методы: анализ релевантной литературы, обучающий эксперимент, формализованное анкетирование, статистические методы.

Результаты исследования. Установлено, что бакалавры используют ИИ для структурирования информации (73,9 %), написания выводов (78,3 %), составления обзора литературы (60,9 %) и генерации идей (52,2 %). Магистранты и аспиранты с помощью ИИ оформляют статьи и список литературы (73,9 %). Наиболее эффективными ресурсами респонденты признали ChatGPT (\bar{x} = 8,5 и 8,2 балла), DeepSeek (\bar{x} = 8,2 и 7,7 балла) и Chatpdf (\bar{x} = 7 и 7,7 балла). Магистранты и аспиранты более критичны при описании достоинств инструментов ИИ и чаще выявляют недостатки.

Выводы. Различия между бакалаврами и магистрантами/аспирантами в выборе ресурсов ИИ и в оценке их достоинств и недостатков обусловлены разным уровнем

их исследовательской компетенции и степенью готовности к самостоятельной научной деятельности. Применение ИИ облегчает студентам решение ряда задач, однако только квалифицированные преподаватели способны контролировать исследования обучающихся и информировать о корректных и недопустимых способах применения ИИ в науке.

Ключевые слова: ИИ-инструменты в науке, гуманитарные исследования, классификация ИИ для исследований, высшая школа, мнение обучающихся, преимущества, недостатки

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Финансирование. Работа выполнена без внешних источников финансирования.

Вклад автора: И.Е. Абрамова – постановка проблемы исследования, обоснование концепции и разработка методологии исследования, дизайн и организация исследования, сбор, анализ, обработка материала, анализ результатов эмпирического исследования, формулировка выводов и результатов исследования, написание черновика рукописи.

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IMPORTANCE

The new “Education Development Strategy until 2040”, aimed at building the human resources potential of modern science and economics, is designed to ensure a breakthrough level of scientific and technological development in the Russian Federation. To achieve this result, comprehensive measures are needed, including the creation of a “methodologically sound system for training specialists with the required research competencies” in scientific-technical sphere [1]. Nevertheless, according to E.V. Karavaev and V.V. Malandin, from 2015 to 2023, the total number of Russian researchers decreased by 10 %, while the number of candidates of sciences employed in the scientific field decreased by 17 % [1].

According to SJR (*International Science Ranking*) for 1996–2024, China and the United States continue to be the leaders in the ranking of countries in terms of the number of world-class scientific studies conducted and the number of relevant publications in the journals of the Scopus database. The Russian Federation occupies 12 place¹. In addition, it is China and the United States that are leading both in the application of AI technologies in education², so is the number of publications devoted to the use of AI in various scientific

¹ Scimago Journal & Country Rank. 2024. URL: <https://www.scimagojr.com/countryrank.php> (accessed: 02.06.2025).

² The Artificial Intelligence race: ChatGPT and education by country // Education news. 2023. April 14. URL: https://vogazeta.ru/articles/2023/4/14/bigdata/22571-gonka_iskusstvennogo_intellekta_chatgpt_i_obrazovanie_po_stranam (accessed: 02.06.2025).

fields; Russia is on the 18th place³. The objectives of this study do not include an analysis of the economic, social and other reasons for this state of affairs with the personnel potential of Russian science. We are talking about the extent to which Russian students, undergraduates and aspirants are equipped with modern tools for effective research in competitive conditions and the rapid introduction of AI technologies into scientific activities. It is the widespread use of AI-based algorithms that allows us to revolutionize data analysis, generate non-standard hypotheses, significantly increase the speed and accuracy of research, and make long-term forecasts. As X. Zhai and R.H. Nehm note, "...the train has already started...", and the process of actively using AI in science cannot be stopped, it should be adapted to it [2]. The purpose of the study is to develop a basic classification of AI tools used in scientific research of students, undergraduates and graduate students in the humanities, as well as to analyze the subjective opinions of students at different levels of higher education about the effectiveness, advantages and disadvantages of using AI for scientific purposes.

RESEARCH METHODS

Foreign and domestic publications analyze in detail the transformative impact of AI technologies on scientific research in various fields of knowledge. The advantages of using AI algorithms in materials science and molecular genetics for analyzing large amounts of data and automated experiments are described by S. Padakanti, P. Kalva and

V.R. Kommidi [3]. The powerful predictive abilities of neural networks in modeling and forecasting geological processes analyze C. Shen et al. [4]. G. Huang and co-authors wrote about the deep integration of physics, climate science and AI for the purpose of climate modeling, emphasizing the need for dynamic diagnostics and physical limitations that AI does not always take into account. In this regard, scientists propose to develop a culture of interaction between scientists and AI technologies based on the principles of openness, comparability and reproducibility (Open, Comparable, Reproducible) [5]. The strengths of AI in applied sports research are related, according to P. Dürking with co-authors, with the automation of time-consuming tasks, with the recognition of complex patterns and relationships. At the same time, the disadvantages include limited adaptability to new situations, excessive dependence on technology, risks of privacy violations, and data manipulation [6].

AI tools are also widely used in the humanitarian field, where attitudes towards AI are also ambiguous. A.Yu. Telitsyna, studying the aspects of integrating AI into social science research, describes methods and tools for using AI to analyze bibliographies and texts, interpret results, and write the text of a scientific article [7]. The editors of the Journal of Research in Science Teaching in an editorial confirmed the data that AI can help in the study of literature, generate code for data analysis, create mock-ups of manuscripts, brainstorm and check spelling [8]. O. Alyaglobi with co-authors, investigating the implementation of large ChatGPT and Gemini language models in the field of applied linguistics based on the analysis of relevant articles from Scopus and Web of Science, identified the following strengths of AI applications in linguistics: innovative

³ Scientific and publication activity in the field of artificial intelligence: expert opinion. 2024. URL: https://ai.gov.ru/knowledgebase/kompanii-razrabotchiki-i-startapy/2024_nauchno-publikacionnaya_aktivnosty_v_sfere_iskusstvennogo_intellekta_1_kvartal_2024_ncrri/ (accessed: 02.06.2025).

research applications using semantic similarity measures; effective linguistic analysis; facilitating global collaboration and access to the information. Among the weaknesses are problems with the quality and accuracy of AI-generated content; reduced creativity and ethical issues; technical limitations in solving complex problems of academic writing [9]. Y.F. Alfarraj and Y. Vardat attributed linguistic competence, the complexity of knowledge, and the creation of an interactive environment to the advantages of using ChatGPT in humanitarian research. Disadvantages such as lack of context, bias towards results, limitations in the development of cognitive abilities, and plagiarism were identified [10]. L. Giray with co-authors pay attention to such advantages of AI as an extensive knowledge base and information, fast translation from different languages, quick information search and literature review, and active dissemination of knowledge. At the same time, among the disadvantages are a lack of understanding of the context, unreliable information, a decrease in critical thinking, a potential erosion of higher-order cognitive thinking, and a violation of ethics, which forces scientists to seek a balanced approach combining AI and human ingenuity to preserve the integrity of research [11].

In the work of H.F. Mohamed and D.B. Elballat analyzed the attitude of 92 teachers from Egypt and a number of Arab countries to the use of AI by students in scientific research and predicted three scenarios for the future development of the situation (optimistic, neutral, pessimistic), which teachers may face as a result of uncontrolled use of AI resources by students. Teachers, however, allow the use of AI tools to obtain background information and compile literature (for example, using Semantic Scholar and Connected Papers), while emphasizing

the need to increase the digital competence of teachers themselves to control and inform students about the permitted and prohibited ways of using AI in scientific research [12]. According to K. Singh Jaj and co-authors, AI tools can be used by students of medical universities, providing specialized information exchange, joint research activities and communication between research teams. However, to increase the accuracy and reliability of the content entered into scientific databases based on AI, expert control is required [13]. T. Mulally analyzes the real-world experience of integrating AI into student research, highlighting such advantages as rapid data analysis, predictive modeling, and the preparation of a review of scientific literature. Among the problems, the author highlights the influence of AI on teacher burnout and impaired interpersonal communication [14]. Nevertheless, it is difficult to disagree with S. Wells' opinion that while teachers are debating whether students can be allowed to use AI applications for scientific purposes, students are actively gaining experience and independently forming their attitude to AI in science and education [15].

Among the leading Russian teachers responding to the new technological challenge in education, P.V. Sysoyev and co-authors should be singled out, who developed a matrix of AI tools and successfully tested them in the process of linguistic and methodological training of future foreign language teachers. [16]. Nevertheless, P.V. Sysoyev, M.N. Evstigneev, and D.O. Sorokin conducted an experimental study in which 245 2–4 year students of pedagogical specialties at Derzhavin Tambov State University participated, and found that the majority of respondents (85.2 %) use AI tools when writing coursework and qualifications. works without notifying teachers, appropriating “<...> the authorship of feedback materials

from AI" [17]. Such situations, of course, require centralized legal regulation by the state, which experts rightly write about, noting that in the absence of such standards, individual Russian universities are forced to regulate the use of AI technologies by local acts [18]. At the same time, as Y. Li notes, in China and a number of Western countries, regulatory and legal regulation of the use of generative artificial intelligence in education and science is already being implemented [19].

R.Z. Elsakova and co-authors proposed a classification of neural networks for the formation of educational content by university teachers of different disciplines, grouping them into three categories: interdisciplinary, which can process a wide range of queries; specialized, performing narrow tasks, and auxiliary, helping to visualize data [20]. Within the framework of this study, an attempt has been made to compile a basic classification of AI tools that can be used by students of humanities at various levels of higher education in the framework of independent research activities. It should be noted that the AI resources described below were not randomly selected: most of them were included in an electronic questionnaire compiled by Elsevier in 2024 to obtain expert opinions from scientists from different countries on the feasibility of using AI tools in world-class science. The scientist also participated in this survey and had the opportunity to review this list, adding to it the most popular Russian-language resources with similar functions. According to Tables 1–3, AI tools for scientific purposes are divided into 3 main blocks, taking into account the functionality: 1) AI for the search and analysis of relevant sources; 2) AI for visualizing research results; 3) AI for editing the texts of articles, checking grammar and style, and creating a list of references. Table 1

shows AI applications that allow you to quickly find and analyze scientific articles on a given topic. According to Table 1, the first block is represented by the largest number of AI applications, since the accelerated search for necessary sources, data, information and their analysis is most in demand in any branch of knowledge. Responding to this request, developers of similar algorithms have created a large number of programs with duplicate functions. The choice of the appropriate resource is determined by the researcher's personal preferences. Table 2 describes the AI technologies that help create the design of the obtained results.

Table 2 shows the second block, which includes applications that are in demand in the humanities to formalize the results. They not only help to choose ideas on how to enhance the quality of data presentation, but also contribute to a comprehensive display of the results of humanitarian research, making them more understandable to a wide audience. Table 3 contains information about AI tools capable of editing ready-made texts.

According to Table 3, the third block contains AI tools that are in demand when editing academic texts on humanitarian issues, which, by definition, should have a high level of uniqueness. AI assistance is required to check literacy and style, as well as to perform routine work on formatting the list of references in accordance with the requirements of the publisher.

The study, organized by specialists from the Department of Foreign Languages of the Humanities at PetrSU, involved 46 students, including 23 2nd-year undergraduate students with advanced English studies (International Relations) and 23 undergraduates and postgraduates of the 1st year of study in the humanities at PetrSU. Undergraduates

and postgraduates were grouped into one group of informants, as they have a similar learning goal – conducting independent research and presenting its results in a dissertation. Scientific methods such as relevant literature analysis, educational experiment, formalized questionnaires with open and closed types of questions, and statistical methods were used. During the experiment, within the framework of the module “English for Academic purposes”, students were asked to select one or two resources from the above list of AI (Tables 1–3), master them, study the functionality in detail, and write instructions for use for research purposes. Then, the students presented the selected AI applications to the audience, informing fellow students about their capabilities, advantages, and limitations, including those of an ethical nature. Next, all participants in the experiment studied the proposed AI tools for three weeks, tested them in practice, selecting the most convenient ones for themselves. In conclusion, an electronic questionnaire was conducted.

RESULTS AND DISCUSSION

At the end of the experiment, the participants were asked to answer the questionnaire questions. Each of the questions was aimed at solving specific tasks: 1) to find out which of the AI applications applicable in humanitarian research were tested by the participants during the experiment; 2) to identify respondents' subjective perception of the degree of effectiveness of various AI resources in their scientific activities; 3) determine which tasks of scientific activity, in the opinion of the participants, AI tools help them to solve.; 4) analyze the subjective perception of informants of the advantages and disadvantages of using AI in research. The survey results are described below.

Task 1. To find out which of the AI resources used in humanitarian research were tested by the participants during the experiment. The respondents were asked to answer the question of which applications from the list (Tables 1–3) they chose for practical use and are ready to continue using in their scientific activities. The data obtained is shown in fig. 1.

After processing the respondents' responses, it was revealed that not all of the AI tools presented in the list aroused the interest of the participants in the experiment and were tested by them. For example, the resources Litmaps, The Lens, Renderforest, and anysummary.app were not of interest to any of the groups of respondents, either due to low awareness of these resources, the availability of other resources with similar functions, or the lack of unique features or advantages over already known and used tools and difficulties with the program interface. In addition, Grok is not used by undergraduates and has a low percentage of use among undergraduates/postgraduates (4.3 %), which may indicate either little-known or low functionality of the resource, according to informants. According to the data presented in Fig. 1, ChatGPT and Gamma are the most popular resources for research work among both undergraduates (56.5 and 52.2 %, respectively) and undergraduates/post-graduates at PetrSU (43.5 and 47.8 %). DeepAI and DeepSeek are also widely used not only by undergraduates (34.8 % and 30.4 %, respectively), but also by graduate students- tami (39.1 and 34.8 %, respectively). Undergraduates and postgraduates were ahead of bachelors in choosing Perplexity (47.8 and 43.5 %, respectively), Chatpdf (43.5 and 39.1 %), Visme (26 and

Table 1

Block 1: search and analysis of relevant sources

Name of the resource	Application possibilities	Functional advantages	Functional limitations
1	2	3	4
Elicit	Quick search for relevant articles on request; generation of short annotations; synthesis of results from several articles; identification of common topics, concepts, results	Save time by automating data extraction tasks; high accuracy with the provision of sources for verification; flexibility and accessibility for individual and group research	Limited by empirical research, not suitable for theoretical or non-empirical fields. Problems with the accuracy of the generated information. Analyzes only information in academic articles
ChatPDF.AI	Literature review, search for relevant academic publications, analysis and synthesis of large amounts of information from PDF files (scientific articles, reviews, monographs, etc.), a brief summary of the content	Extracts data from PDF (.pdf), Word (.doc, .docx), PowerPoint (.ppt, .pptx), Markdown (.md), etc. files. Highlights the main thoughts from the text, finds answers to queries. Saves time searching for information. Embedded source links link responses to PDF pages	Sometimes it simplifies or loses the context. The free version has document size limits of up to 120 pages or the number of requests. Incorrectly analyzes images and complex tables, and may give inaccurate answers
ChatGPT	Writing papers, generating ideas on a topic, analyzing data, formulating topics, questions, and possible research directions	Save time, analyze data, improve text quality	The risk of inaccuracies, erroneous or outdated answers. Problems with ethics, plagiarism, and uniqueness. Superficial conclusions and judgments are not a substitute for the critical thinking and creative approach of a scientist
Perplexity	Search and systematization of relevant information. Analyzes sources, provides short direct answers to queries, and offers suggestions for further search	It processes requests quickly and provides reliable answers with links to information sources. The free version works without restrictions in Russia; you can customize the search sources; available on different devices: website, browser extension, mobile app	She cannot create original content, conduct a full-fledged dialogue, like ChatGPT chatbots; the accuracy of responses depends on the quality of the sources used; may be subject to bias based on the data on which she was trained; Internet connection is required

Continuation of Table 1

1	2	3	4
DeepSeek	A multifunctional system for content generation (creation of texts, articles, descriptions, answers to questions), data analysis (large amounts of information, identification of patterns, prediction of results), generation of hypotheses	High performance. Versatility. Continuous learning, models can improve over time by adapting to new data. Save time by automating routine research tasks. Accessibility	Limited understanding of the context, may make mistakes in complex or ambiguous situations. The dependence of the model's work on the quality and volume of data on which it was trained. It requires significant computational power to train the model. Error risk: AI may generate inaccurate information if the data is incomplete or outdated
DeepAI	Review of sources, identification of contradictions and gaps in existing research; generation of new research hypotheses; visualization of links between various scientific papers	Analysis and generalization of information, highlighting key results, methods, citations; text generation, images. Versatility. Simple interface. The possibility of training your own models. Protecting the confidentiality of data. Multi-language support. Visual data Analytics	Difficulties in assessing the reliability of sources, inaccuracy in determining the degree of uncertainty of data, the need to double-check the results before use, limitations of the free version, the quality of text generation, lack of support for negative formulations of prompt
Claude AI	Analysis of complex data, generation of hypotheses, new experimental directions, review of scientific literature, forecasting the effectiveness of inventions, writing articles and grant applications	Simplicity and security. Context retention. Processing of large texts. A wide range of possibilities from data analysis to content creation. Intuitive interface. Constant support and updating of services. Integration with third-party tools and services	Not flexible enough and less creative in content generation. It cannot create images, but analyzes those that have already been uploaded. The model's responses may be overly censored. Some features, including Projects and Artifacts, are only available in paid subscriptions.
Semantic Scholar	Search for scientific articles by context. Provides a deep and meaningful understanding of scientific research. Extraction of key data from articles (research objectives, methods, results and conclusions). Offers relevant articles based on scientific interests and previous searches	Understanding the context allows you to find relevant articles. Filters allow you to narrow down search results by various parameters. Sort search results by relevance, number of citations, and year of publication. Visualization of links between articles (citations, references, and common topics). Search by various fields (article title, author, keywords, research area, etc.). Free access to all functions	Insufficiently critical selection of publications, lack of quality control of articles. Limited possibilities of formatting citations. Search for sources only among publications that are available for free

End of Table 1

1	2	3	4
The Lens	Search and analysis of scientific literature and patents	A large database and a set of filters. Intuitive interface. The ability to export data in different formats (JSON, CSV, RIS or BibTeX). Using data to create applications. You can set up alerts	Export restrictions – 1000 documents can be exported without registration. Lack of format .xlsx. You can upload data only in JSON/CSV/RIS/BibTeX formats.
Litmaps	Quick search for relevant articles, filter results by keywords, authors and publication dates, visualization of links between various scientific publications.	Visualization of links between different articles. Automated notifications about new publications on the topic. Configurable. Multi-language support. Joint work. Integration with PubMed and Google Scholar scientific databases, as well as with link managers (Zotero and Mendeley)	Limitations of the free version. The cost of paid tariffs. The difficulty of using it for beginners. Absence of plagiarism detection. Integration Limitations
anysummary .app	Extract key ideas from uploaded files and generate short summaries. Generalization of scientific papers and research results	Quick analysis. Customizable resumes. Support for various file types (PDF and Word files) and multiple languages. Data security. The possibility of integration	Limitations of the free version. Some features are missing from the free plans. Problems with data confidentiality. Language restrictions. Dependence on the Internet

Source: compiled by the author based on the results of an analysis of relevant literature.

Table 2

Block 2: Visualization of research results

Name of the resource	Application possibilities	Functional advantages	Functional limitations
1	2	3	4
Gamma	Automated creation of presentations with visualization, design and structure for presenting research results	Saving time. Intuitive interface. A creative approach to creating visualization. The free version. Flexibility (various output formats and multimedia integration). Built-in analytics	Limited functionality in the free version, dependence on the Internet, results may require improvement, complex visualizations require external tools
Excel, Google Sheets, ChatCSV, SheetAI, Genius Sheets и др.	They organize work with large tables, analytics, graphs, and summary reports. They allow you to sort and filter data, work with formulas, and build graphs	Accurate and fast data analysis to simplify working with tables. Saving time. Reducing the probability of errors. They allow you to visualize data	Limited functionality in the free versions: ChatCSV and Deepsheet AI provide completely free access to the functionality. SheetAI, Rows, and AI Excel Bot allow you to work with tables by limiting the number of accesses. Most of the tools are paid, and you can test their capabilities only in the demo version
Kandinsky 3.0	Create visual content for articles, presentations, and reports based on a text description. Generation of scientific illustrations and graphs. Visual data analysis and processing, working with graphical information. Visualization of complex ideas, schemes, and concepts. Assistance in preparing presentations of scientific reports	Creative modeling: creating diagrams, diagrams, and visual interpretations of complex scientific concepts. Assistance in the preparation of scientific publications: generation of auxiliary graphics for scientific papers, presentation of complex scientific data in a visual form. Supports various artistic and scientific styles. Intuitive interface and easy to use. The free version has basic functionality and limits on the number of requests. Integration with other services	Limited accuracy of query interpretation. Possible stylistic deviations from standard scientific illustrations. Limited control over the fine details of complex graphs and charts. Lack of specialized tools for technical and scientific graphics (for example, accurate graphs, maps and diagrams); does not replace professional data visualization programs (for example, MATLAB, Origin, AutoCAD); unpredictability of artistic interpretation

End of Table 2

1	2	3	4
Infogram	Creating infographics. Allows you to present the research data in a visually appealing way	The availability of ready-made templates, the possibility of branding, support for interactive formats and animations, integration with WordPress. Allows you to create professional infographics even for those who have no experience in design	Limited setup. Not flexible enough to create personalized or complex visualizations. Dependence on Internet connection. Download restrictions. It is only possible to download charts for offline use on paid plans. High cost. Problems with support
Visme	Multifunctional editor for data visualization and creation of professional presentations and infographics for scientific conferences and publications	A wide range of templates and elements, the ability to create videos, integration with various data sources (Google Analytics, Excel, Google Tables), convenient tools for configuring data display	Limitations of the free version. The difficulty of mastering some functions requires experience. Dependence on the Internet. Limitations of the mobile version

Source: compiled by the author based on the results of an analysis of relevant literature.

Table 3

Block 3: editing the text of articles, checking grammar and style, making a list of references

Name of the resource	Application possibilities	Functional advantages	Functional limitations
1	2	3	4
Grammarly	It improves grammar and spelling, style, makes the text more professional and easier to read, checks punctuation, vocabulary, and plagiarism	Improving the quality of written scientific text. Ensuring originality. Personalized settings for text requirements. Accessibility and ease of use. Versatility	Premium features require a paid subscription. Sometimes it may suggest options without taking into account the intended context. An internet connection is required for full functionality. Support is limited to English only
Perplexity AI	Automatic search and registration of relevant sources	Checking the relevance and significance of sources. Providing context and annotations for each source. Registration of the list of references according to GOST, taking into account the specifics of the scientific field. May suggest a list of references based only on the topic of the work	Verification of results for low-volume sources is required. Limited functionality without subscription
Reference Generator	A highly specialized service for the formation and final processing of a ready-made list of sources according to GOST	Maximum accuracy and support for all major international and Russian standards. Verification and addition of incomplete bibliographic data. The function of batch formatting a list from multiple sources. Export to various formats	Limited functionality beyond the bibliography. Paid subscription for access to all features

End of Table 3

1	2	3	4
Sigmachat and other resources ⁴	The Russian dialog AI is used to formalize a list of references, can write a list of references based on incomplete data, checks the relevance of sources and suggests alternatives	Quickly and accurately generates a list in the context of scientific work in compliance with the design standards GOST, APA, MLA, etc. It saves time, reduces the risk of errors, and makes the final text meet academic standards. It is integrated with Russian scientific databases (RSCI, CyberLeninka, eLibrary). Intuitive interface	Limited support for some highly specialized formats. The need for a stable Internet connection to access all functions

Source: compiled by the author based on the results of an analysis of relevant literature.

⁴ **NeuroTexter** is a Russian neural network that specializes in designing a list of references according to current Russian state standards; **GenApi** is a multifunctional service where a list of references is formed taking into account various design standards, including all Russian state standards and international formats; **Anthropic Claude** is an intelligent assistant with advanced academic skills; **Campus** is an online service that optimizes the process of compiling a list the literature is in accordance with Russian state standards and supports various types of sources: books, articles, dissertations, etc.; **GPT-Tools** is an online service that helps you quickly select and arrange a list of references using a neural network, automatically creates a list of references according to State Standard, APA, MLA and other formats, processes references, ISBN, DOI and other sources.

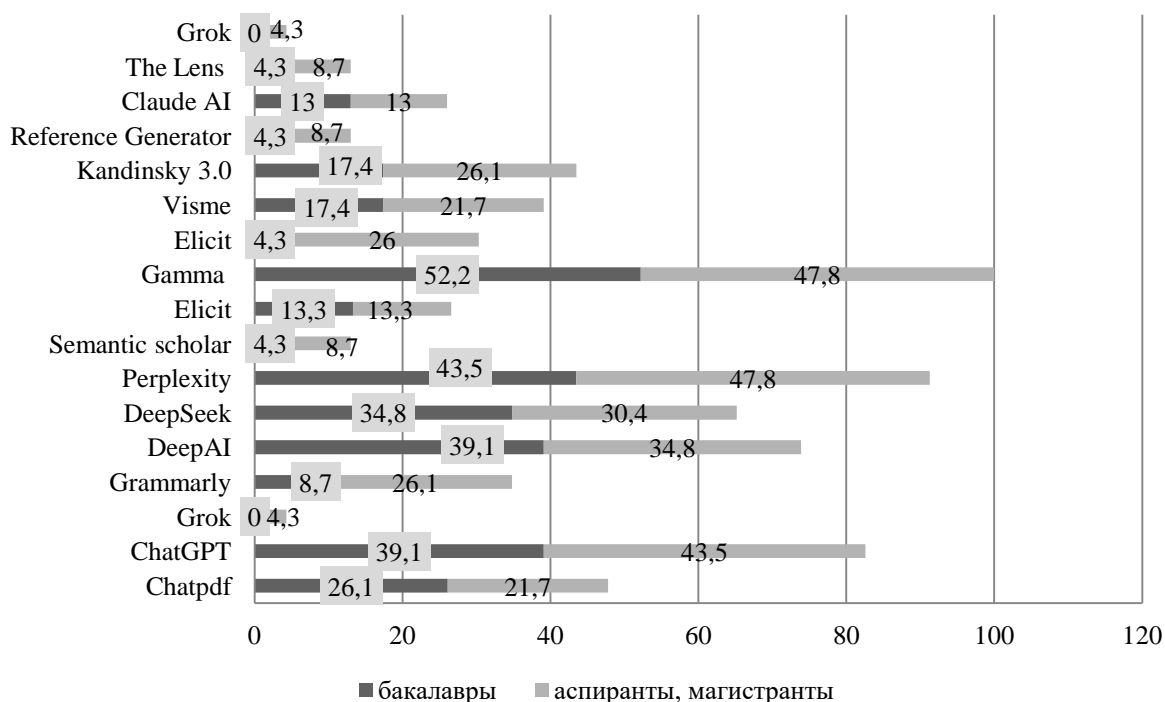


Fig. 1. AI applications used by Bachelor students, Master's Degree students and Post-Graduate students of the humanities at Petrozavodsk State University in their research, including %

Source: compiled by the author based on the results of a survey.

21.7 %), Kandinsky 3.0 (26.1 and 17.4 %, respectively). Also, undergraduates and graduate students used Elicit (26 % vs. 4.3 %) and Semantic Scholar and Reference Generator (8.7 % vs. 4.3 % in both cases, respectively) slightly more often than bachelors. Grammarly was used by a moderate number of respondents (26.1 % of undergraduates/postgraduates and 8.7 % of bachelors): Some students value it as a tool for improving the quality of writing, but they do not consider it the main research tool.

A comparative analysis of the data revealed that ChatGPT is the leading resource for both groups of informants. The revealed differences in preferences between undergraduates and undergraduates/postgraduates are probably related to different personal

experiences of independent scientific activity, as well as individual needs. While undergraduates prefer universal AI tools that help solve a range of different tasks, undergraduates and graduate students are more selective and prefer specialized AI.

Task 2. To identify the subjective perception of the participants of the experiment of the degree of effectiveness of various AI tools in their scientific activities. To solve this problem, the participants were asked to evaluate (on a scale from 1 to 10 points) AI tools according to their effectiveness. The results are presented in Table 4.

An analysis of the data in Table 4 shows that users recognized ChatGPT, DeepSeek and Chatpdf as the most effective and functional, which received the highest average

scores and Mo. The survey participants noted the average degree of effectiveness in Visme, Gamma, Elicit, Perplexity Kandinsky 3.0, and DeepAI applications. The resources with low productivity were recognized by Reference Generator, Claude AI, Semantic Scholar, Grammarly. The Visme resource was rated higher by bachelors (6.3, $M_o = 6$ against 5.4 and $M_o = 5$ undergraduates and postgraduates). In relation to the Gamma application, the values of the average score and fashion were the same (6 points). Undergraduates and postgraduates rated Elicit slightly higher (5.9, $M_o = 6$), than bachelors (5.3, $M_o = 5$), a Perplexity It turned out to be more valuable for bachelors (5.4 against 5.3).

The resources of Kandinsky 3.0 and DeepAI have average scores (in the range from 4 to 5), while Semantic Scholar, Grammarly, Reference Generator, and Claude AI have low scores from 3 to 4 points.

Task 3. Identify the tasks of scientific activity that, in the opinion of students, AI tools help them solve. The respondents were asked to indicate in which research tasks the AI tools proved to be the most effective. Among the specific tasks that AI helps to solve, bachelors and undergraduates/postgraduates named the following: information structuring (73.9 % of bachelors and 21.7 % of undergraduates/postgraduates-writing conclusions (78.3 and 30.4 %, respectively); reviewing relevant literature (60.9 and 34.8 %), searching for sources and relevant references (65.2 and 43.5 %), generating ideas (52.2 and 21.7 %), correcting errors in the text (43.5 and 26 %), compiling and formatting a list of references (26.1 % of undergraduates and 73.9 % of undergraduates/postgraduates, respectively). At the same time, bachelors use AI more actively to structure information, write conclusions,

review literature, and generate ideas, since they are less independent and more in need of additional counseling. At the same time, undergraduates and postgraduates are more independent in their scientific activities, which indicates their higher level of scientific training.

Task 4. To analyze the subjective perception of the advantages and disadvantages of using AI in the research process. An analysis of the experimental participants' responses to the question about the main advantages of using AI in the scientific work of the university showed that respondents attributed to them time savings and acceleration of the process of searching and processing information (78.3 % of bachelors and 65.2 % of undergraduates and graduate students, respectively), assistance in understanding complex phenomena (82.6 and 43.5 %), structural thoughts (73.9 and 30.4 %), absence of anxiety, a comfortable atmosphere for learning and self-improvement, assistance in finding resources (69.6 and 21.7 %, respectively). Among the disadvantages of using AI in scientific work at the moment, the study participants noted a decrease in the ability of critical thinking due to excessive trust in AI (39.1 % of undergraduates and 73.9 % of undergraduates and postgraduates), inaccurate data, the risk of unreliability and a superficial approach (56.5 and 78.3 %), low level of originality (47.8 and 86.7 %), unrepresentative conclusions (43.5 and 69.6 %, respectively). The results show that undergraduates are less critical than undergraduates and graduate students when evaluating AI tools and see fewer disadvantages when using them in research.

The conducted experiment allowed to achieve the following results.

1. A comparative analysis of the data shows that, in general, bachelors choose

more AI tools for testing in scientific work than undergraduates and graduate students, since they are less independent and more in need of additional advice from their scientific activities.

2. The respondents recognized ChatGPT, DeepSeek, and Chatpdf resources as the most effective. The survey participants noted the average degree of effectiveness in recourses Visme, Gamma, Elicit, Perplexity Kandinsky 3.0, DeepAI. Reference Generator, Claude AI, and Grammarly have a low degree of efficiency.

3. Differences in the use of AI by two groups of respondents have been identified: bachelors actively use AI to structure information, write conclusions, review literature, and generate ideas. Graduate and undergraduates are more focused on using AI to design their work and literature list, which is determined by the level of scientific training of the respondents, their independence and understanding of the requirements for scientific work.

4. The advantages of AI tools included saving time, simplifying the understanding of complex material, assistance in structuring and finding resources, as well as comfort in learning. The disadvantages of AI tools in scientific activity are considered by students to be a decrease in the ability of critical thinking, insufficient quality of information, plagiarism, the risk of inaccuracy of information and its superficial study.

RESULTS AND DISCUSSION

Our data do not contradict the conclusions of A. Alduais et al. that the strengths of AI are the automation of time-consuming tasks, the recognition of complex patterns and relationships [9], as well as the conclusions of L. Giray et al. about quick access to a large database of publications and information, convenient information search and literature review, and active dissemination of knowledge [11]. The identified disadvantages of using AI in scientific research

Table 4

Subjective opinion of Bachelor students, Master's Degree students and Post-Graduate students on the degree of effectiveness of AI tools in scientific activity (average score and fashion)

Name of the AI resource	Degree of effectiveness	Average score		Fashion	
		Bachelor's degrees	Undergraduates, postgraduates	Bachelor's degrees	Undergraduates, postgraduates
ChatGPT	High degree of efficiency (10-7 points)	8.5	8.2	9	8
DeepSeek		8.2	7.7	8	8
Chatpdf		7.0	7.7	7	7
Visme	Average efficiency (6.9–4 points)	6.3	5.4	6	5
Gamma		6.0	6.0	6	6
Elicit		5.9	5.3	6	5
Perplexity		5.4	5.3	5	5
Kandinsky 3.0		4.7	4.2	5	4
DeepAI	Low degree of efficiency (3.9–1 point)	4.6	4.2	5	4
Reference Generator		3.9	4.0	4	4
Claude AI		3.9	4.0	4	4
Semantic Scholar		3.7	3.9	3	4
Grammarly		3.9	3.7	3	3

Source: compiled by the author based on the results of the study.

coincided with the data of O. Alyaglobi et al. about the not always high quality and accuracy of AI-generated content, reduced creativity and ethical violations [9], with the conclusions of K. Singh Jaj et al. about inaccurate data and insufficient context, a superficial approach to interpreting the results, a limitation in the development of cognitive abilities, the presence of plagiarism [13], as well as T. Mulally's data on a decrease in critical thinking [14]. It is difficult to disagree with the thesis of S. Wells talks about the need to improve digital literacy and the qualifications of teachers themselves, who should monitor the research activities of students at different levels of education and inform them about possible ways to use AI in scientific research, as well as issues related to scientific ethics [15].

The difference between this study and those conducted earlier is that the strengths and weaknesses of using AI tools in humanitarian research were analyzed from the point of view of the students themselves: undergraduates, undergraduates and post-graduates. This made it possible to identify noticeable differences both in the choice of specific AI resources for solving various tasks, and in assessing the advantages and disadvantages of AI tools due to different levels of research qualifications and the degree of readiness for independent scientific activity of the participants in the experiment.

CONCLUSION

In modern realities, AI is becoming a “transformative technology” that affects various aspects of social life, including scientific research, education, and publishing [11]. In the field of scientific research, AI provides new opportunities for processing large amounts of data, automating routine tasks, and detecting new dependencies in complex systems. Despite the fact that the use of AI can significantly simplify and speed up the completion of many tasks, an important prerequisite for successful work is a balanced approach that combines the capabilities of AI and human creativity, which is crucial for maintaining the integrity of research and realizing the potential of AI in scientific research. Along with numerous positive aspects, it is necessary to take into account the potential limitations associated with the use of AI in the humanities. Issues of ethics, data bias, and interpretation of results require careful consideration. AI does not replace critical thinking and intuition of a scientist, but rather complements traditional research methods. Of course, the integration of AI into the humanities offers unique opportunities for transforming the research process, but it requires awareness and consideration of its complexities and risks. Only teachers with digital competencies can professionally manage students' research, informing them about the correct and unacceptable ways of using AI in science. It is important to continue studying the interaction between man and AI in order to maximize the potential of AI, while maintaining high standards of scientific practice and ethics.

References

1. Karavaeva E.V., Malandin V.V. (2025). Problems of staffing for the scientific and technological development of Russia in the light of the new education development strategy formation until 2040. *Vysshee obrazovanie v Rossii = Higher Education in Russia*, vol. 34, no. 1, pp. 30-41. (In Russ.) <https://doi.org/10.31992/0869-3617-2025-34-1-30-41>, <https://elibrary.ru/mrnzia>
2. Zhai X., Nehm R.H. (2023). AI and formative assessment: the train has left the station. *Journal of Research in Science Teaching*, vol. 60, issue 6, pp. 1390-1398. (In Russ.) <https://doi.org/10.1002/tea.21885>, <https://elibrary.ru/jbzwfx>
3. Padakanti S., Kalva P., Kommidi V.R. (2024). AI in scientific research: empowering researchers with intelligent tools. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, vol. 10, no. 5, pp. 416-422. <https://doi.org/10.32628/CSEIT241051012>, <https://elibrary.ru/tpwzkw>
4. Shen C., Appling A.P., Gentine P. et al. (2023). Differentiable modelling to unify machine learning and physical models for geosciences. *Nature Reviews Earth & Environment*, vol. 4, pp. 552-567. <https://doi.org/10.1038/s43017-023-00450-9>, <https://elibrary.ru/bgfsgy>
5. Huang G., Wang Y., Ham Y.G. et al. (2024). Toward a learnable climate model in the artificial intelligence era. *Advances in Atmospheric Sciences*, vol. 41, pp. 1281-1288. <https://doi.org/10.1007/s00376-024-3305-9>, <https://elibrary.ru/ypoaef>
6. Düking P., Leppich R., Holmberg H.-C. (2023). Strengths, weaknesses, opportunities, and threats associated with the application of artificial intelligence in connection with sport research, coaching, and optimization of athletic performance: a brief SWOT analysis. *Frontiers in Sports and Active Living*, vol. 5, pp. 1-6. <https://doi.org/10.3389/fspor.2023.1258562>, <https://elibrary.ru/prhemu>
7. Telitsyna A.Yu. (2024). Optimization of scientific activities through ai integration: neural networks as a tool in working with academic literature. *Monitoring obshchestvennogo mneniya: ekonomicheskie i sotsial'nye peremeny = Monitoring of Public Opinion: Economic and Social Changes*, no. 5 (183), pp. 218-236. (In Russ.) <https://doi.org/10.14515/monitoring.2024.5.2623>, <https://elibrary.ru/fehozo>
8. Sadler T.D., Moore Mensah F., Tam J. (2024). Artificial intelligence and the Journal of Research in Science Teaching. *Journal of Research in Science Teaching*, vol. 61, issue 4, pp. 739-743. <https://doi.org/10.1002/tea.21933>, <https://elibrary.ru/hfnylm>
9. Alduais A., Qasem F., Alasmari M. (2025). A SWOT analysis of generative AI in applied linguistics: leveraging strengths, addressing weaknesses, seizing opportunities, and mitigating threats. *F1000Research*, pp. 1-26. <https://doi.org/10.12688/f1000research.155378.2>
10. Alfarraj Y.F., Wardat Y. (2024). Exploring the impact of ChatGPT on scientific research: assessing strengths, weaknesses, opportunities, and threats. *Education as Change*, vol. 28, pp. 1-27. <https://doi.org/10.25159/1947-9417/16006>
11. Giray L., Jomarie J., Gumalin D. (2024). Strengths, weaknesses, opportunities, and threats of using ChatGPT in scientific research. *International Journal of Technology in Education*, vol. 7, no. 1, pp. 40-58. <https://doi.org/10.46328/ijte.618>, <https://elibrary.ru/tzvvsu>

12. Mohmed H.E., Elballat D.B. (2024). The attitudes of faculty staff members and their assistants towards students' use of AI tools in scientific research. *International Journal for Humanities & Social Sciences*, vol. 1, no. 1, pp. 49-61. <https://doi.org/10.69792/IJHS.24.1.5>
13. Jhaji K., Jindal P., Kaur K. (2024). Use of artificial intelligence tools for research by medical students: a narrative review. *Cureus*, vol. 16 (3), art. e55367. <https://doi.org/10.7759/cureus.55367>, <https://elibrary.ru/hlmarn>
14. Mulally T. (2024). An experiential journey: a year of a professor using AI in the classroom and research. *International Journal of Studies in Education and Science*, vol. 5, no. 3, pp. 246-256. <https://doi.org/10.46328/ijses.98>, <https://elibrary.ru/dlvqnt>
15. Wells S. (2024). Ready or not, AI is coming to science education – and students have opinions. *Nature*, vol. 628, pp. 459-461. <https://doi.org/10.1038/d41586-024-01002-x>, <https://elibrary.ru/fpbxqg>
16. Sysoyev P.V., Filatov E.M., Evstigneev M.N., Polyakov O.G., Evstigneeva I.A., Sorokin D.O. (2024). A matrix of artificial intelligence tools in pre-service foreign language teacher training. *Vestnik Tambovskogo universiteta. Seriya: Gumanitarnye nauki = Tambov University Review: Series Humanities*, vol. 29, no. 3, pp. 559-588. (In Russ.) <https://doi.org/10.20310/1810-0201-2024-29-3-559-588>, <https://elibrary.ru/jazkme>
17. Sysoyev P.V., Evstigneev M.N., Sorokin D.O. (2025). Structural model of pre-service teacher training based on artificial intelligence technologies. *Perspektivy nauki i obrazovaniya = Perspectives of Science and Education*, no. 3 (75), pp. 139-155. (In Russ.) <https://doi.org/10.32744/pse.2025.3.9>, <https://elibrary.ru/flenno>
18. Sysoyev P.V., Evstigneev M.N. (2025). The use of artificial intelligence technologies in the students' research work. *Vestnik Moskovskogo universiteta. Seriya 19: Lingvistika i mezhkul'turnaya kommunikatsiya = Moscow State University Bulletin. Series 19. Linguistics and Intercultural Communication*, vol. 28, no. 1, pp. 85-101. (In Russ.) <https://doi.org/10.55959/MSU-2074-1588-19-28-1-6>, <https://elibrary.ru/aynwsu>
19. Li Ya. (2023). Specifics of regulatory and legal regulation of generative artificial intelligence in the UK, USA, EU and China. *Pravo. Zhurnal Vysshei shkoly ekonomiki = Law. Journal of the Higher School of Economics*, vol. 16, no. 3, pp. 245-267. (In Russ.) <https://doi.org/10.17323/2072-8166.2023.3.245.267>, <https://elibrary.ru/yitzoa>
20. Elsakova R.Z., Kuzmina N.N., Markus A.M., Kuzmina N.M. (2024). Classification of neural networks for creating educational content by university educators. *Vestnik Yuzhno-Ural'skogo gosudarstvennogo universiteta. Seriya: Obrazovanie. Pedagogicheskie nauki = Bulletin of the South Ural State University. Series: Education. Educational Sciences*, vol. 16, no. 2, pp. 17-29. (In Russ.) <https://doi.org/10.14529/ped240202>, <https://elibrary.ru/bgyefb>

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