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The Impact Of Artificial Intelligence On Academic Writing: Linguistic And Stylistic Analysis In Higher Education

Anastasiia Sibruk¹, Prykhodko Oksana¹, Svitlana Lytvynska², Cheripko Sergii¹, Hanna Onufriychuk¹, Viktor Sibruk¹

¹State University "Kyiv Aviation Institute", Kyiv, Ukraine

Corresponding Author: Anastasiia Sibruk Email: anastasiia.sibruk@npp.kai.edu.ua

Abstract. The rapid advancement of artificial intelligence (AI) technologies has fundamentally transformed educational processes, raising critical questions about academic integrity, ethical technology use, and AI's role in student learning. This research examines both the challenges and benefits of AI implementation in higher education, with particular focus on its impact on academic writing, research practices, and student behaviors. Special attention is given to analyzing lexical, phraseological, and stylistic characteristics of AI-generated scholarly texts. The research was conducted through surveys of students at the State University "Kyiv Aviation Institute" and the National University of Life and Environmental Sciences of Ukraine. Findings reveal that current AI-detection software remains imperfect, while instructor evaluation persists as the most reliable verification method. Effective integration of AI in academic work requires balancing its capabilities with students' critical thinking skills. The study concludes that AI should serve strictly as an auxiliary tool, never replacing original intellectual effort and creative approaches to learning. Keywords: AI, features of academic text, science research, academic integrity, educational process, Chat GPT.

1 INTRODUCTION

Academic style requires precision, objectivity, structure, and proper linguistic presentation. In the modern world, AI serves as an auxiliary tool. Artificial Intelligence (AI), particularly generative models (such as ChatGPT), is increasingly being used for: structural assistance (AI helps create outlines, generate headings, and build logical flow); linguistic editing (helps eliminate grammatical errors, improve stylistic consistency, and ensure academic tone); rephrasing (instead of plagiarism – rewriting ideas in different words, improving academic language);ontent generation with caution (AI can provide reference information, but its texts must be verified due to potential use of fake sources and facts).

The problematic aspects of using AI include: plagiarism – uncritical copying of AI-generated text without editing violates academic integrity; lack of depth – AI does not replace genuine critical thinking and cannot construct arguments "from scratch"; excessive homogeneity – AI-generated texts are sometimes stylistically "flat," lacking depth and originality.

Identifying AI-generated text remains a major hurdle today. While many plagiarism detectors and text analysis tools claim to spot AI-written content, their accuracy is still questionable – even their creators admit this. Currently, no software or online platform can guarantee flawless detection of machine-generated material. Surprisingly, the results are often inconsistent: original passages (like certain word patterns) might be mistakenly labeled as AI-created, while clearly automated text can pass as human-written.

2. Aim and tasks

The purpose of this article is to summarize the knowledge gained during the training of undergraduate and graduate students in the development of artificial intelligence (AI) and to highlight emerging trends in education.

Key objectives of the study include: features of the use of AI in academic and research work; lexical features of texts generated using AI; study of potential risks and obstacles associated with the implementation of AI.

3. Research methods

The study employed various research techniques to address specific objectives, including: the descriptive approach, the comparative-historical method, structural analysis incorporating component analysis, aspects of statistical evaluation, and the associative experiment technique.

² National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

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4. DISCUSSION

In modern science, a text is a phenomenon of both linguistic and extralinguistic reality – a complex phenomenon that performs various functions: it participates in communication, helps preserve and transmit information across space and time, records the mental life of individuals, serves as a product of a specific historical era, and acts as a form of cultural existence, among other roles.

An important role in a scholarly text is played by the title. The title of an academic text is an informative unit that reflects the work's topic and corresponds to its content. It conveys the author's intent and sets the boundaries of the information to be presented. Artificial intelligence is often used in generating titles, as it can provide multiple variations on the same topic.

Thus, creating an academic text is a complex process that includes both pre-textual preparation (planning, material selection, structuring) and textual implementation (writing, organizing, editing). The ability to work effectively at each of these stages ensures a high level of academic writing.

The specifics of working with a scholarly text are driven by the objective need to process textual information in the most efficient analytical-synthetic manner. This, in turn, requires the development of two interrelated skills: analyzing a text based on its compositional-semantic structure, resenting the obtained information concisely in various genres of written work.

The concept of normativity in academic discourse involves the conformity of linguistic units to established norms of the literary language: orthoepic, grammatical, lexical, and stylistic. Adhering to lexical and stylistic norms is particularly important, as it determines whether the text is perceived as scientifically sound, logical, and clear.

One component of scholarly language culture is lexicographic competence, which includes:

Motivational and emotional-aesthetic components – a stable, conscious need, an evaluative attitude, and interest in mastering the achievements of Ukrainian lexicography, a belief in the social significance of lexicographic knowledge, a desire to conduct lexicographic research, and the cultivation of linguistic taste through broadening philological horizons, as well as professional satisfaction from the work. Spiritual values and the depth of an individual's lexicographic knowledge play a crucial role here.

Cognitive component – knowledge of dictionary types, works by Ukrainian lexicographers, features of dictionary entries, and their variations across different dictionary types, as well as professional lexicographic work with texts.

Operational-activity component – skills in applying lexicographic knowledge in professional activities: perceiving, recognizing, analyzing, comparing linguistic phenomena and facts, commenting on and evaluating them in terms of normativity and appropriateness to the communication context; understanding the role of synonymic, antonymic, phraseological, orthoepic, orthographic, and other dictionaries in shaping an individual's language culture; conducting comparative analyses of dictionaries; possessing skills in collecting and processing lexicographic material (including digital); and compiling custom reference dictionaries, among others [5].

Before examining the texts written by students, a small survey of students at two higher education institutions was conducted. The survey was attended by 126 respondents 3 (103 - State University "Kyiv Aviation Institute", 23 – National University of Life Resources and Environmental Sciences of Ukraine) who are higher education students of this university.

In Figure 1 we can see the age groups of the respondents.

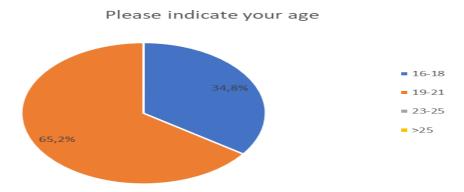


Fig. 1. Age ranking of respondents

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We can see that the largest proportion of respondents (65.2%) fall within the 16-18 age group, indicating that nearly half of participants are teenagers or young adults, most likely first-year university students.

The second largest category consists of respondents aged 19-21 years, comprising 34.8% of the sample. This group also primarily represents young students.

Thus, our study will be based on young people, mainly aged 16-22. They were asked to answer the question "How often do you use AI?"

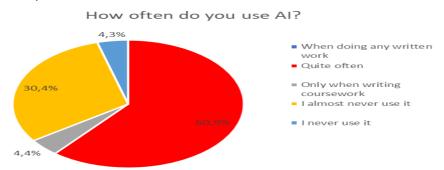


Fig. 2. Frequency of using AI

The key findings are as follows:

60.9% of respondents reported using AI quite frequently, indicating high popularity of artificial intelligence technologies among participants.

30.4% stated they hardly ever use AI, which may suggest either limited awareness or lack of need for such tools.

Thus, the majority of respondents actively use AI in their daily activities, while about a quarter use it little or not at all. This distribution demonstrates the growing role of AI in learning and information retrieval, but also indicates the presence of groups among education seekers who have not yet integrated these technologies into their lives [25-26].

After the results were obtained, it was extremely important to understand whether the applicants were using AI correctly? Do they understand the importance of maintaining academic integrity in scientific and professional spheres? Therefore, higher education students were asked the question "Do you discuss the issue of maintaining academic integrity with your coaches?".



Fig. 3. Discussion of artificial intelligence in academia

The figure presents the results of a survey addressing the question:

78.3% of respondents answered "Yes," indicating a fairly high level of discussion on academic integrity issues between students and faculty.

17.4% stated that they do not discuss this issue at all, which may suggest a lack of initiative either from instructors or students, or a general lack of attention to this topic in certain higher education institutions. 4.3% of respondents believe that these discussions are insufficient, meaning the topic is addressed, but not in a systematic or in-depth manner.

Thus, the majority of students engage in discussions about academic integrity with their instructors, which is a positive trend in fostering an ethical educational culture. However, nearly one-third of respondents report a lack or insufficiency of such discussions, highlighting the need for higher education institutions to place greater emphasis on this topic.

All students who passed the survey work with academic papers. Scientific text editing is carried out in three stages:

Initial review of the document text. Before starting to edit the text, it should be read in full. During the

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first reading, it is not advisable to make corrections, but you can make notes in the margins or jot down quick remarks on a separate sheet of paper.

Verification of factual material. At this stage, it is advisable to check the accuracy and reliability of the information provided and consider whether there is enough factual material for the given text.

Actual text editing. This stage requires linguistic correction: fixing spelling, punctuation, and stylistic errors. Edits in the text should be made in blue or black ink (not red). Words and numbers in the text should be clear and neat. The corrected text should be reprinted and proofread once more.

Among the main types of linguistic errors, lexico-phraseological violations are particularly widespread, encompassing deviations in the use of lexical units and fixed language constructions. These can be caused by insufficient language competence, the influence of other languages, calquing, surzhyk (mixed speech), as well as excessive use of bureaucratic language or journalistic clichés in scientific writing.

Lexical errors are deviations from the norms of lexical compatibility, semantic accuracy, appropriateness, and stylistic conformity of words. In scientific texts, not only lexical correctness is crucial but also terminological precision, semantic clarity, and the aesthetic refinement of language.

Common types of lexical errors include:

- Unmotivated semantic modification of lexemes using a word in a meaning not inherent to it.
- Unnecessary verbosity the use of so-called "empty words" that carry no informational value.
- Pleonasm unconscious use of near-synonyms (words close in meaning but different in sound), where one is redundant.
- Tautology unintentional repetition of the same word within a phrase or sentence, or the use of words with identical or similar meanings.
- Synonym misuse unconscious selection of a word from a synonymous series that does not quite fit (or is entirely unsuitable) for a given communicative context.
- Paronym confusion unconscious use of words that sound similar but have different meanings.
- Interlingual homonymy unconscious use of words influenced by another language that sound similar but are semantically distant.
- Lexical calquing unconscious use of calqued words (often from Russian), translating them literally into Ukrainian.
- Unmotivated borrowings unconscious use of foreign words in meanings not native to them.

The most common phraseological errors include:

- Unmotivated semantic modification of phraseological units;
- Unconscious use of linguistic expressions, particularly situational clichés;
- Unmotivated calquing of phraseological units;
- Unconscious use of descriptive linguistic expressions, mostly those functioning in the Russian language, and their literal translation into Ukrainian.

The core of scientific discourse phraseology consists of terminological phraseology, i.e., phraseological units corresponding to scientific concepts. They are used in speech as ready-made language units, with their primary function being nominative. Terminological phraseology includes compound terms, both general and highly specialized (e.g., printed form, keywords, retrospective bibliography, etc.).

The main purposes of phraseology in scientific texts are:

To express logical connections between parts of an utterance (as the analysis has shown, provide examples, it follows that, based on the obtained data, give due credit, draw attention, present arguments, rely on facts);

To denote specific concepts (degree of research, scientific novelty, theoretical significance, specific weight, urgent need).

Thus, lexical and phraseological violations are not merely breaches of linguistic norms but also indicators of the general level of language culture. They can distort meaning, undermine the speaker's credibility, and hinder communication. In academic discourse, avoiding such errors is an essential requirement for texts of high communicative and scientific quality.

Students often generate texts in different genres. Sometimes even in a journalistic style.

Example of AI generated text in Ukrainian in English version:

Good evening,

I would like to express my interest in submitting my work in electronic format due to difficulties with the

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manuscript and limited writing ability. In this regard, the possibility of providing a medical certificate to confirm these circumstances is being considered.

I would like to point out that the existing problems with the manuscript are expressed in the difficulties of providing clear and easily understandable written material. In the event of a positive resolution of this issue, I am ready to attach an appropriate medical certificate indicating the presence of medical restrictions that complicate the writing process.

I would be grateful for your understanding and support in this matter.

The AI-generated text is an email from a student to a professor, requesting an assessment of an academic assignment submitted electronically. The text exhibits stylistic inappropriateness for the communicative context and violates multiple linguistic norms (stylistic, lexical, grammatical, and punctuation-related).

The genre of the letter sample requires adherence to epistolary style, accounting for the intent, status of the communicators (student \rightarrow professor), and communication vector (a request). Such a speech situation demands appropriate etiquette formulas and specific syntactic structures. However, the letter's syntax, grammar, and vocabulary reveal a clumsily constructed text that aligns not with epistolary style but with formal bureaucratic language.

The Al-generated letter not only contains numerous linguistic and stylistic errors but also appears artificial and unnatural. It is evident that the language model used by the student poorly supports Ukrainian, resulting in Russified lexical and grammatical deviations. The text fails to meet the standards of polite, context-appropriate academic communication, instead resembling a stiff bureaucratic document [1; 7]. Artificial intelligence (AI) has become a new stage in the development of not only scientific and technological progress in the third millennium but also a new wave of digitalization across all spheres of

Artificial Intelligence (AI) – a rapidly developing field of computer science and computational linguistics focused on creating intelligent machines capable of performing tasks that typically require human intelligence [3-4; 10].

AI can generate almost anything – from texts and images to complex analytical reports with graphs, tables, and diagrams.

The most well-known and widely used AI tools today include:

- ChatGPT (and its alternatives like Microsoft Bing, Claude AI);
- Gemini (Google);

human activity [15-20].

- Microsoft Copilot;
- DeepSeek (developed in China);
- Grok (created by Elon Musk's company).

Since the emergence of AI in 2023, higher education students have actively begun using AI tools to generate various types of assignments, multimedia presentations, and even academic texts, including term papers and qualification works (bachelor's and master's theses). This has become a serious issue of academic misconduct.

A survey conducted among higher education students in the context of teaching the discipline "Academic Integrity and Professional Ethics" revealed that:

All students use AI without exception, but not all understand when AI serves as a substitute for creative intellectual work (effectively completing tasks instead of the student, which constitutes academic misconduct).

Many fail to recognize when AI should instead act as an assistant and effective tool in performing intellectual, creative, and academic tasks within the framework of university education.

The Educational Paradigm of Higher Education Students

The educational paradigm of higher education students encompasses two vectors: academic (learning) and scientific (research).

How Can AI Be Useful in a Student's Academic Activities?

In the learning process, AI can assist students by:

Simplifying complex topics - AI can explain difficult concepts in simple terms, provide examples, or suggest additional resources for better comprehension.

Providing answers to questions (enhancing self-study capabilities) – Students can test their knowledge, receive feedback, and better prepare for classes and exams (acting as an AI tutor).

Automating routine tasks - AI can help with text editing, drafting, compiling bibliographies, etc., allowing

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students to focus on creative work.

Improving writing skills - AI tools can offer style, grammar, and structural suggestions to enhance writing proficiency.

Summarizing sources - AI can help condense and paraphrase key points from academic texts.

Processing foreign-language literature – AI can assist in translating and analyzing texts in other languages. Creating multimedia presentations – AI can generate presentations based on given parameters to showcase learning outcomes [11].

Generating video materials – Some tasks are better illustrated in video format. AI tools like Qwen 2.5, Hello AI, KLING 1.6 can help create videos, while MMAudio, SunoAI, Adobe Podcast, Auphonic, or Descript can add audio [6].

Depending on the purpose and type of research, students can use AI for:

- Processing scientific texts (summarizing, annotating, condensing).
- Analyzing trends to select a research topic.
- Sourcing and verifying references.
- Identifying keywords.
- Transliterating texts (for citations).
- Detecting logical errors in texts.
- Generating article abstracts.
- Editing texts in an academic style.

Writing a qualification (diploma) thesis is a complex and crucial stage in a student's academic journey, requiring extensive knowledge, effort, time, and analytical skills. Using AI as an assistant can significantly simplify this task, serving as a supportive resource in drafting term papers or thesis projects [21-22].

Using Artificial Intelligence in Thesis Preparation:

1. Selecting a relevant topic and research idea.

Modern chatbots can suggest promising research directions and ready-made topics based on various inputs, including the student's skills, specialization, academic interests, and prior experience (if any).

2. Processing large volumes of information on the chosen topic.

All currently handles various data types effectively, including plain text, text files, websites, images, and more.

3. Analyzing and selecting literature on the research problem.

AI tools can quickly identify relevant sources while filtering them for relevance and academic credibility.

4. Adapting foreign sources to Ukrainian academic standards.

AI helps contextualize international research by aligning it with local academic requirements.

5. Verifying source credibility.

Specialized AI programs can cross-reference information against authoritative research, preventing the use of outdated or unreliable data.

6. Creating an outline (table of contents).

AI can propose a logical thesis structure while adhering to academic writing conventions.

7. Sorting and systematizing research materials.

AI tools help organize information thematically and establish connections between sections.

8. Structuring and formatting according to academic standards.

AI automates formatting tasks (citations, bibliographies, headings) to meet institutional requirements.

9. Identifying keywords and writing abstracts.

AI algorithms extract key terms and generate summaries that capture the research essence.

10. Scientific style text editing.

AI tools like ChatGPT refine wording to eliminate non-academic phrasing.

11. Error correction (lexical, stylistic, grammatical, logical).

Programs like Grammarly or QuillBot detect and correct errors to enhance text quality.

12. Bibliography formatting.

Automated citation tools (Zotero, Mendeley) generate properly formatted reference lists.

13. Scientific text processing (thesis statements, annotations, summarization).

AI condenses texts and highlights key ideas for literature reviews.

14. Data visualization (graphs, charts, diagrams, tables).

AI creates visual representations of research findings.

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15. Transliterating text into Latin script [12].

Today, there is a significant problem with identifying AI-generated texts. While most modern plagiarism detection tools and services claim to offer AI-content identification features, the quality of this service remains notably low – a fact even acknowledged by the developers of these programs and online services [13, 23].

Key Drawbacks of Using AI in Education

- Misuse in academic work Some students rely entirely on AI to generate research papers, essays, and assignments without doing independent work. This violates academic integrity and devalues education [24].
- Decline in critical thinking Overuse of AI weakens students' ability to analyze information and solve problems independently, as ready-made answers reduce the need for deep thinking.
- Al's limitations in critical analysis: It produces text based on existing data and often struggles with context or original perspectives.
- Risk of misinformation AI can provide inaccurate or outdated answers, spreading errors and unreliable data.
- Copyright and plagiarism issues Using Al-generated text without proper editing or sourcing may lead to plagiarism.
- More people are turning to AI for solving various tasks—coding websites, cooking advice, essay writing :) and even casual conversations. When chatting with AI, most users don't scrutinize its accuracy, but for a student relying on it for a philosophy paper, high-quality output is crucial. However, even ChatGPT's developers warn that it can make mistakes and advise verifying critical information.
- Al-generated text feels soulless. It often uses unnatural phrasing and loves bullet points annoying when you need cohesive answers to exam questions. Instead of a fluid response, you get fragmented, robotic snippets that don't actually answer anything [14].

5. CONCLUSIONS

Thus, it can be noted that higher education faces certain risks, including:

- 1. Loss of critical thinking and analysis due to excessive reliance on AI, which may generate inaccurate, outdated, or falsified information.
- 2. Decreased originality in works created with the help of AI.
- 3. Risk of losing independent research and information processing skills.
- 4. Falsification of research data, given AI's key capability generating information.
- 5. AI may misinterpret complex concepts or provide information without considering context.
- 6. Even the most advanced AI models can make mistakes, invent facts, cite incorrect sources, or produce logically inconsistent texts.

It is also worth noting that the use of AI in education may pose risks to privacy, as the personal data of students and teachers are collected and stored on various platforms. This raises concerns about data security and calls for stronger measures to protect it.

AI tools and platforms may be inaccessible to some students due to socioeconomic or geographic limitations, potentially widening educational inequality.

There is a risk that AI algorithms could reinforce biases and discrimination, as personalized learning materials may – intentionally or unintentionally – amplify certain cultural or ethnic stereotypes.

Automated AI systems may fail to account for students' emotional and psychological needs, lacking the human judgment that is crucial in the learning process.

The use of AI in education requires addressing ethical dilemmas, particularly regarding the collection of students' personal data and its use in automated decision-making. Informed consent from participants in the educational process must be ensured.

The implementation of automated grading systems comes with uncertainties, as conventional metrics (such as grades) do not always reflect the full picture of academic progress and fail to consider an individualized approach to learners.

Despite Al's potential to optimize learning, such systems cannot fully replace human interaction between teachers and students, which may ultimately affect the quality of education.

As of early 2025, AI still faces several challenges, particularly with its databases – especially in niche or specialized topics. Additionally, AI's handling of the Ukrainian language remains limited, meaning better

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results often require using English instead.

A notable issue is AI-generated text, which often lacks a natural human flow and stands out as artificial. Sometimes, AI doesn't fully grasp the task at hand or lacks sufficient depth of information.

However, I can already see AI making rapid progress (evident in advancements like image and video generation), and it seems these shortcomings will likely be resolved in the near future. For now, AI remains an incredibly powerful assistant for students – whether in problem-solving, clarifying complex topics, or providing explanations.

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