Artificial intelligence in higher education: Opportunities and risks for student research

Anastasiia Sibruk[1,*,†], Oksana Prykhodko[1,†], Bakhytzhan Akhmetov[2,†], Serhii Cheripko[1,†], Viktor Sibruk[1,†], Chrystyna Dybik[1,†] and Hanna Onufriichuk[1,†]

[1]*Scientific Cyber Security Association of Ukraine, Mykhaila Dontsia Str., 2A, Kyiv, 03161, Ukraine*
[2]*Abai Kazakh National Pedagogical University, Dostyk Ave.,13, Almaty, 050010, Kazakhstan*

Abstract

The rapid advancement of Artificial Intelligence (AI) has significantly impacted education, raising critical questions about academic integrity, ethical use, and the role of AI in student learning. This article examines the challenges and opportunities AI presents in higher education, focusing on its influence on academic writing, research, and student behavior. Through a survey of 103 students at Kyiv Aviation Institute, the study explores AI usage frequency, awareness of academic integrity, and students' ability to distinguish AI-generated content. Findings reveal that while most students utilize AI tools, many lack a systematic approach to ethical application, with 61.2% expressing neutral attitudes toward plagiarism. The article highlights the limitations of AI-detection software and emphasizes the irreplaceable role of educators in assessing authenticity. Additionally, it discusses best practices for integrating AI as a supportive tool in research and thesis writing, advocating for a balanced approach that combines AI efficiency with critical thinking. The study concludes with recommendations for fostering academic integrity, enhancing AI literacy, and developing institutional guidelines to ensure responsible AI use in education.

Keywords

Artificial Intelligence (AI), science research, academic integrity, educational process, qualifying research paper (QRP)

1. Introduction

Artificial Intelligence (AI) has become a new stage in the development of not only the scientific and technological progress of the third millennium but also a new wave of digitalization across all spheres of human activity. In the third millennium, an era of total digitalization in all areas of public life, the rapid advancement of information and communication technologies (ICT) and artificial intelligence (particularly ChatGPT) has brought issues of academic culture and integrity in the educational and scientific activities of higher education students into sharp focus – both globally and in Ukraine.

Artificial Intelligence (AI) is a rapidly evolving branch of computer science and computational linguistics focused on developing intelligent machines capable of performing tasks that traditionally require human intelligence. AI can generate nearly anything – from images to complex analytical reports. The most well-known AI systems today include ChatGPT (along with analogs like Microsoft Bing and Claude AI), Gemini, Microsoft Copilot, China's DeepSeek, Grok (by Elon Musk), and others. However, the most functional – and thus the most popular among students – remains ChatGPT.

Today, a significant challenge exists in detecting AI-generated texts. Most modern plagiarism-checking tools and popular text analysis services advertise AI-detection features, yet the reliability of these tools remains notably low – a fact even acknowledged by their developers. No existing software

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*Corresponding author.

†These authors contributed equally.

sibruknastya@gmail.com (A. Sibruk); prykhoxa2017@gmail.com (O. Prykhodko); bakhytzhan.akhmetov.54@gmail.com (B. Akhmetov); sergijceripko@gmail.com (S. Cheripko); vics@bigmir.net (V. Sibruk); chrystyna1991@ukr.net (C. Dybik); anya.onyfriichuk@ukr.net (H. Onufriichuk)

0000-0002-4007-2450 (A. Sibruk); 0000-0002-9441-4196 (O. Prykhodko); 0000-0001-5622-2233 (B. Akhmetov); 0009-0002-7131-7016 (S. Cheripko); 0000-0001-7997-5641 (V. Sibruk); 0009-0007-2527-8753 (C. Dybik); 0000-0002-7589-4411 (H. Onufriichuk)

or online service can provide 100% accurate analysis of AI-generated content. The results are often counterintuitive: unique text fragments (e.g., shingles) may be falsely flagged as AI-generated, while clearly machine-produced content is classified as entirely original. This underscores the irreplaceable role of human judgment in the verification process. Educators, researchers, and subject-matter experts remain critical in assessing textual authenticity, leveraging their professional expertise to discern nuances that automated systems cannot.

2. Aim and tasks

The aim of the paper is to summarize the experience of training bachelor's and master's degree students in the era of artificial intelligence development and to describe emerging trends in the educational process.

Key research objectives: to outline priority areas for working with artificial intelligence in academic and research activities; to analyze threats and challenges associated with using AI technologies; to teach students how to utilize cutting-edge technologies for knowledge enrichment and deeper learning.

3. Research methods

The following methods have been used to solve certain tasks in research: descriptive, comparative-historical, structural with the use of the method of component analysis, elements of statistical analysis, the method of associative experiment.

4. Discussion

The notion of "artificial intelligence" can be delineated through the following definitions:

- Artificial Intelligence (AI) – A rapidly developing branch of computer science and computational linguistics focused on creating intelligent machines capable of performing tasks that typically require human intelligence [1, 2, 3, 4];
- Artificial Intelligence – The simulation of human cognitive processes by machines;
- Artificial Intelligence – A technology capable of replacing human thought processes, such as neural networks;
- Artificial Intelligence – Any tool used by machines to "replicate human behavior, including reasoning, planning, and creativity" [5, 6, 7, 8].

Since the emergence of AI in 2021, higher education students have actively begun utilizing its tools to generate various types of assignments, including academic papers and theses – often violating academic integrity. According to a Stanford University study (2024), there has been a significant increase in investments in generative AI, highlighting its growing influence across multiple sectors, including education [9].

Discussions with students as part of the "Academic Integrity and Professional Ethics" course revealed that while all students use AI, not all understand when its application constitutes a replacement for original intellectual work (a form of academic misconduct) versus when it should serve as a supportive tool for enhancing learning and research.

A 2025 Harvard University survey found that 89% of students admitted to using AI, often unethically – submitting AI-generated work as their own. In response, the university implemented radical counter-measures, including a sharp rise in paper notebook sales on campus, suggesting a pushback against digital dependency.

Lecturers of the State University "Kyiv Aviation Institute" made their own research, conducting a survey among higher education students on the level of proficiency in AI tools. The survey was attended

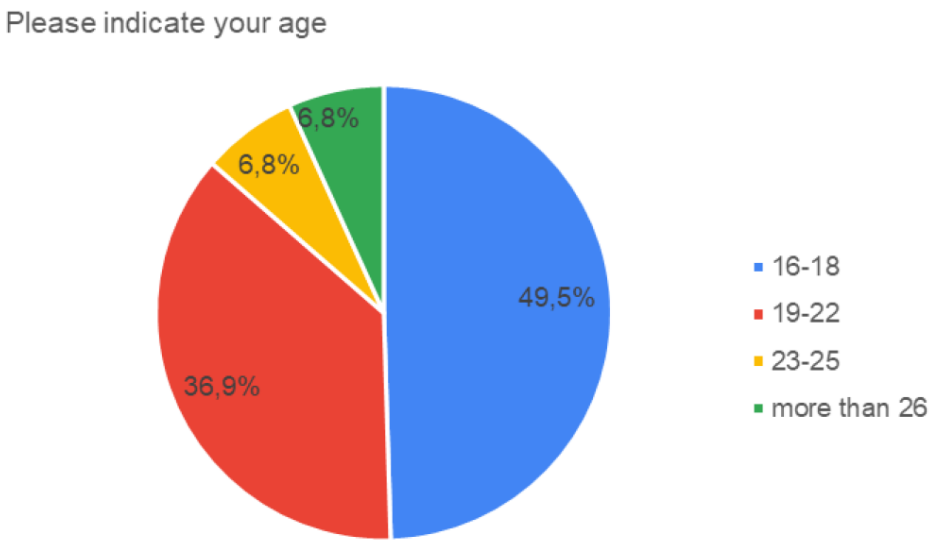

Figure 1: Age ranking of respondents.

by 103 respondents who are higher education students of this university. In Figure 1 we can see the age groups of the respondents.

We can see that the largest proportion of respondents (49.5%) 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 25.2% of the sample. This group also primarily represents young students.

Other age groups are represented to a lesser extent:

- 19-22 years – 11.7% (this category partially overlaps with the previous one, which may reflect first-year university students who completed their secondary education within the last five years);
- 23-25 years – 7.8%;
- Over 26 years – 5.8%.

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?” (Figure 2).

The key findings are as follows:

- 56.3% of respondents reported using AI quite frequently, indicating high popularity of artificial intelligence technologies among participants;
- 24.3% stated they hardly ever use AI, which may suggest either limited awareness or lack of need for such tools;
- 8.7% indicated they apply AI when completing any written assignments – likely representing students who actively utilize AI for academic or professional purposes.

Other response options showed minimal representation (each below 5%):

- "Only for thesis/dissertation writing";
- "Never use it";
- "Experimental usage for familiarization";
- "Use as an information search tool";
- "Usage depends on workload and circumstances".

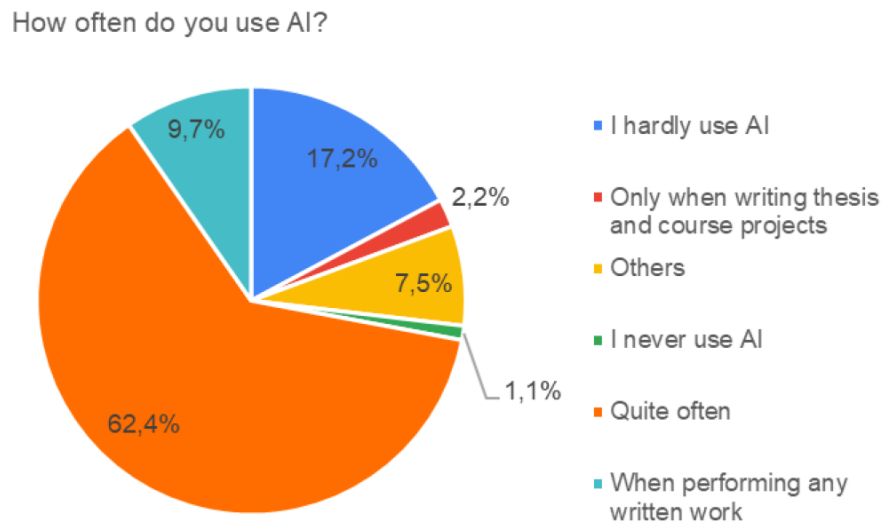

Figure 2: Frequency of using AI.

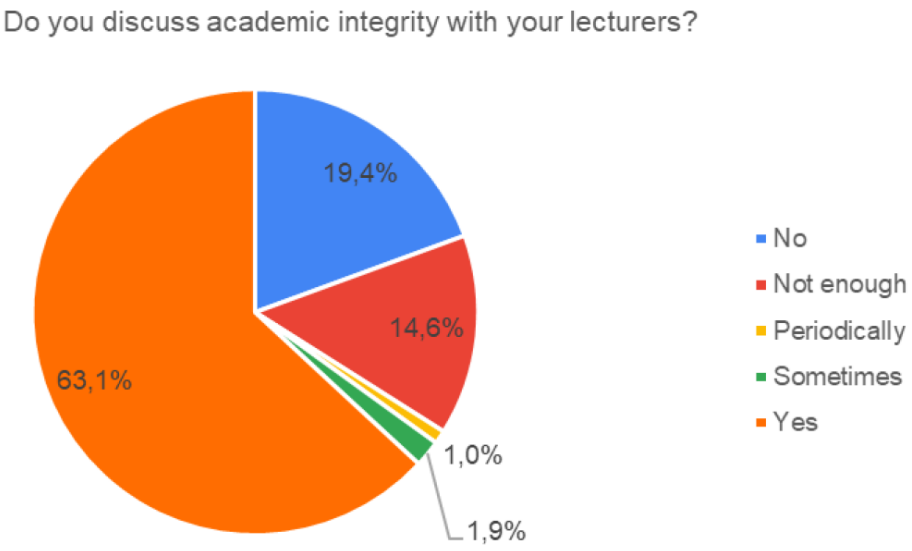

Figure 3: Discussion of artificial intelligence in academia.

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.

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? (Figure 3).

Figure 3 presents the results of a survey addressing the question:

- 63.1% of respondents answered “Yes,” indicating a fairly high level of discussion on academic integrity issues between students and faculty;
- 19.4% stated that they do not discuss this issue at all, which may suggest a lack of initiative either

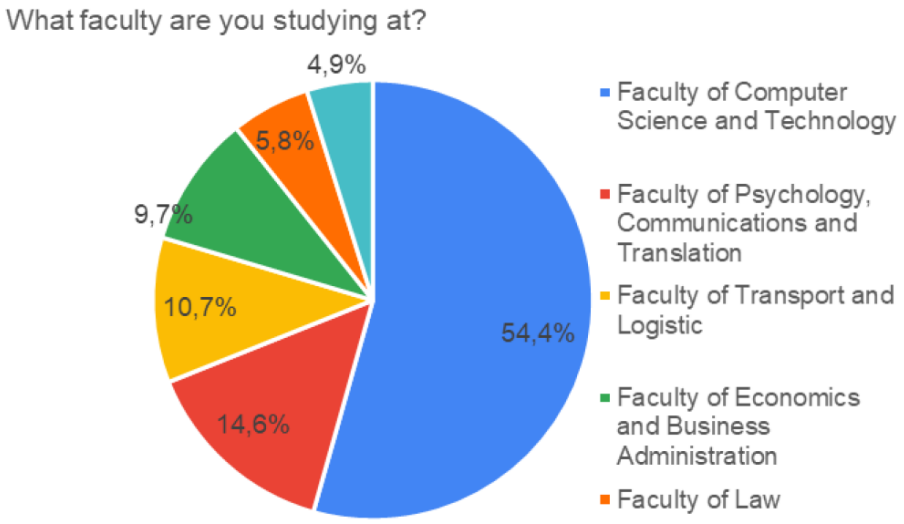

Figure 4: Distribution of students by field of study.

from instructors or students, or a general lack of attention to this topic in certain higher education institutions;

- 14.6% of respondents believe that these discussions are insufficient, meaning the topic is addressed, but not in a systematic or in-depth manner.

Other responses such as “Sometimes,” “Occasionally,” and “Periodically” account for less than 2% each, indicating a minimal impact on the overall picture.

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. For the sake of transparency of the research, students from all faculties of the State University "Kyiv Aviation Institute" participated in the survey (Figure 4).

Figure 4 illustrates the distribution of students by faculty based on their responses.

The largest share of respondents are students from the Faculty of Computer Science and Technology, which may indicate its popularity or a large student enrollment. The Faculty of Psychology, Communication, and Translation ranks second, followed by the Faculty of Economics and Business Administration and the Faculty of Aeronautics, Electronics, and Communications. The fewest respondents are from the Institute of Continuing Education, which may be due to a smaller student population or lower interest in participating in the survey.

Overall, the survey results allow for an assessment of the proportion of students from various faculties, which can be useful for planning events, resource allocation, or further research on the student audience. We also wanted to understand the attitude towards manifestations of academic plagiarism in academic tests among applicants for technical and humanitarian specialties (Figure 5).

Unfortunately, the vast majority of surveyed respondents (61.2%) have a neutral attitude toward academic plagiarism. Academic plagiarism is a serious violation of ethical standards that undermines trust in the academic community, devalues original research, and damages the academic reputation of both individuals and educational institutions. Ideally, the leading group should be students who have a negative attitude toward plagiarism, but currently, they make up only 31.1%.

Analyzing the other indicators, it must be noted that instances of plagiarism – such as copying others’ ideas, texts, or results without proper citation – are incompatible with the principles of academic integrity.

In today’s academic world, it is important not only to generate new knowledge but also to clearly acknowledge the sources used, demonstrating respect for the intellectual property of other researchers.

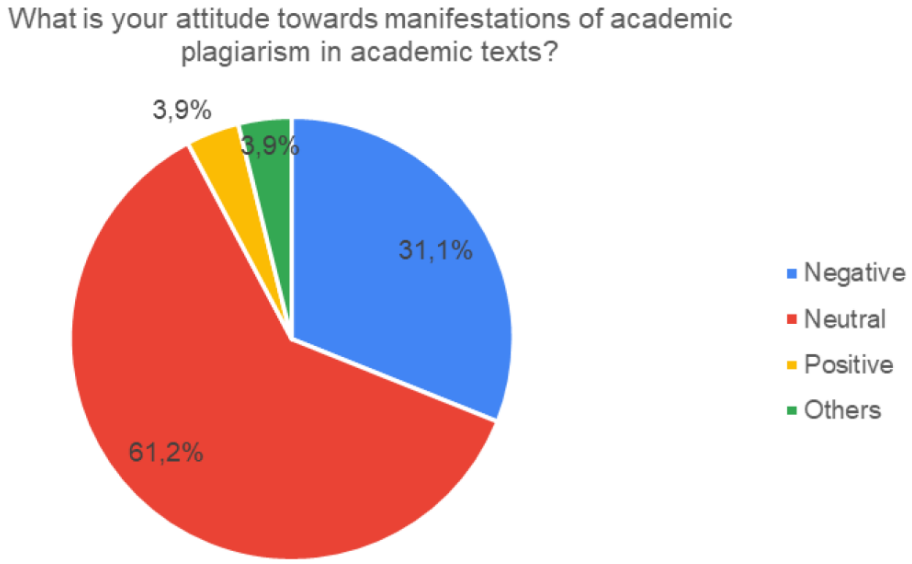

Figure 5: Attitude towards academic plagiarism.

Therefore, combating plagiarism must be systematic: effective mechanisms for detection should be implemented, academic culture among students should be enhanced, and awareness of the value of honest work must be cultivated.

A total of 83 respondents participated in the following survey, which was conducted to explore students' perceptions of academic integrity and their ability to recognize content generated by artificial intelligence (AI).

Here is an analysis of the responses.

Regarding students' understanding of the term "academic integrity," the majority of respondents interpreted it as:

- Honesty and independence in completing assignments (about 70% mentioned these principles).
- Avoidance of plagiarism, falsification, and cheating.
- Respect for intellectual property and the necessity of citing sources and authorship when using others' ideas.
- Personal responsibility and "honesty with oneself."

Some respondents associated academic integrity with moral and ethical standards, truthfulness of results, and fairness in the educational process.

Several responses also emphasized that integrity is not just a set of rules but the foundation of trust in the academic environment, contributing to the development of both the individual and the professional.

"Fair play at university: don't cheat, don't steal ideas, do everything on your own".

"Trying to be honest not only with others, but first and foremost with yourself".

"AI is a tool for understanding, not for doing the task instead of me".

As for identifying and recognizing AI-generated texts or images, a significantly smaller portion of responses directly addressed this topic.

In general, respondents identified the following indicators:

- Unnatural writing style, excessive formality, or templated phrasing.
- Lack of personal experience, examples, or subjective thinking.
- Repetition of phrases, vague generalizations without depth.
- Technical correctness without emotion or creativity.

Some respondents explicitly stated that AI should not be used as a substitute for personal work, but only as an auxiliary tool. At the same time, others acknowledged the difficulty in distinguishing AI-generated texts, especially when they are well-adapted.

In conclusion, the survey demonstrates a high level of awareness regarding the principles of academic integrity among students. However, the level of understanding and skills in recognizing AI-generated content remain at an early stage, indicating the need for further educational efforts.

To enhance awareness, it is advisable to:

- Conduct training sessions on the use of AI in education.
- Provide students with clear guidelines on how to properly cite AI-generated materials.
- Develop critical thinking skills to better identify non-original texts.

It was also extremely important for us to investigate users' level of awareness regarding the identification of content generated by artificial intelligence (AI), particularly texts and images. We received a wide range of responses – from a complete inability to distinguish AI content to the use of specialized analytical tools.

The main findings and trends are as follows:

1. Those who do not recognize AI-generated content (approximately 25%). Some respondents explicitly stated that they do not differentiate or do not know how to do so. A portion of them do not use AI-generated content at all and thus have not considered the issue. 2. Visual or stylistic indicators (around 40%). Most respondents try to rely on:

Texts:

- Excessive structure, lack of emotion or personal style.
- Frequent use of generic phrases, repetitions, and so-called "fluff".
- Excessive "perfection" – grammatically flawless but lacking natural speech.
- Absence of citations, real-life examples, or personal opinion.

Images:

- Anomalous details: extra fingers, distorted eyes, inconsistent lighting and shadows.
- Unnatural appearance, "doll-like" features, glossy or overly saturated colours.
- Lack of logical composition or anatomical coherence.

3. Use of analytical tools (around 20%). Some users utilize online services, such as:

- For texts: GPTZero, Copyleaks, Turnitin.
- For images: Hive Moderation, Sensity, AI or Not.
- Additional methods: checking metadata, using watermarks, analyzing patterns (consistent output behaviors in scientific studies).

4. Combined approach (15%). This group of respondents combines visual intuition with technical tools, edits the received content, adds their own thoughts, and clearly discloses the use of AI in their work (e.g., through source mentions or comments). Student approaches can be illustrated as follows:

- "AI texts are often perfect, but soulless – everything is logical, but lacks authenticity".
- "I check using GPTZero or simply rely on the text's style".
- "I can see it in images instinctively – as an artist, I notice illogical details".

In conclusion, the survey shows that despite the growing popularity of AI, many higher education students still lack a systematic approach to identifying AI-generated content. However, those who actively engage with digital tools or have creative experience are more adept at spotting anomalies.

Therefore, we should:

- Promote awareness of verification tools among students.
- Conduct training on how to recognize common AI-generated traits.
- Most importantly, encourage transparency, meaning the ability to clearly indicate when AI-generated materials are used.

We believe it is essential to take into account the experience of international universities in helping students master artificial intelligence tools. The University of Cambridge, for example, has implemented a training program on the ethical use of digital technologies. This program teaches students the principles of responsible AI use in research, academic writing, and beyond [10].

The Times Higher Education website features an insightful article by Dirk Lindebaum, which explores the potential negative consequences of using ChatGPT in academic research. In the article, the author expresses concern that reliance on this tool could lead to a decline in researchers' analytical skills and limit their theoretical imagination. He also notes that over-reliance on ChatGPT may alter approaches to theorizing by replacing human judgment with formal rationality, which could negatively impact the understanding of social phenomena [11].

So how can AI be useful in the educational paradigm of a higher education student?

To answer this question, it's important to identify AI's capabilities beyond text generation. Different AI models can generate images, photographs, videos (notably MidJourney, Fabula, and DALLE), create graphs, diagrams, charts, tables, 3D models, multimedia presentations, perform advanced search and analysis of massive electronic databases and literary sources, and much more.

In the educational activities of a student, AI can serve as a valuable assistant:

Studying complex topics. AI can explain difficult concepts in simple language (rephrasing), help find relevant examples, or suggest additional resources for better understanding of the material. Getting answers while learning challenging subjects. AI enhances self-learning capabilities. With its help, students can independently check their knowledge and receive feedback on their questions, which improves their preparation for classes and exams.

Automating routine tasks. AI can assist with text editing, drafting content, compiling bibliographies, and more – allowing students to focus on more creative tasks.

Improving writing skills. AI tools can offer suggestions on style, grammar, and structure, helping students enhance their writing abilities.

Facilitating multimedia data processing. For example, services like Otter.ai and Descript allow for quick transcription of audio into text, which is useful for lecture note-taking or recording interviews.

Working with foreign-language literature by translating foreign texts into Ukrainian for better comprehension.

Creating multimedia presentations based on specified parameters (input data) to present learning outcomes effectively.

Generating video content. Sometimes it's more appropriate to present a task, illustrate a concept, or demonstrate a process in video format. Tools like Qwen 2.5, Hello AI, and KLING 1.6 can help with this. Some of these generate video without sound, so to add audio, you can use AI tools such as MMAudio, SunoAI, Adobe Podcast, Auphonic, or Descript.

Scientific activity of higher education students involves writing articles, theses, participating in academic conferences, preparing student research competition papers, developing research projects, and composing coursework and qualification papers (bachelor's or master's theses), among other tasks [12, 13].

AI can be a valuable assistant in:

- Processing academic texts: summarizing, annotating, condensing, or briefly retelling content;
- Analyzing current trends to select a relevant research topic;
- Finding and verifying reliable sources;
- Identifying keywords;
- Transliterating texts into Latin script (for sources);
- Detecting logical inconsistencies in texts;

- Creating article abstracts;
- Editing in academic style;
- Checking for plagiarism.

When conducting research and writing academic papers, authors are obliged to adhere to principles of academic ethics, particularly originality. AI tools can help identify plagiarism by comparing texts against large databases. Some tools can also detect AI-generated content, supporting academic standards and ensuring research originality [14, 15, 16].

Writing a Qualification Thesis (Bachelor's or Master's Work). In the scientific activity of higher education students, especially when preparing a thesis or dissertation, AI can be an indispensable tool. Writing a diploma thesis is a complex and responsible stage in a student's life. It requires significant effort, time, energy, and analytical skills. However, modern technologies, especially AI, can significantly ease this process. AI has already become an essential tool for students, assisting with both routine and more complex academic tasks:

- Choosing a topic or idea for the thesis (identifying current research directions in the relevant field). Modern chatbots can suggest research areas and topics based on input data such as the student's skills, major, and experience.
- Processing large volumes of information on the chosen topic – including text, files, websites, images, and more.
- Selecting relevant literature on the research problem.
- Organizing and systematizing materials for the thesis.
- Adapting foreign sources to align with Ukrainian academic standards.
- Verifying source credibility. Some AI tools can cross-reference information with authoritative academic research to prevent the use of outdated or inaccurate data.
- Creating a work plan (table of contents).
- Structuring the paper logically and coherently.
- Identifying key terms and keywords.
- Writing an abstract for the qualification work.
- Scientific-style editing, including correction of lexical, stylistic, grammatical, and logical errors (tools like Grammarly and QuillBot).AI editing tools help streamline phrases, restructure sentences, and improve flow between text parts. This enhances the quality of a thesis while preserving the author's core ideas – similar to traditional editing or mentoring.
- Using AI to generate potential answers to anticipated thesis defense questions.
- Automating bibliography formatting with citation tools like Zotero and Mendeley.
- Text summarization and annotation for easier content management.
- Visualizing statistical data through charts, diagrams, tables, and infographics.
- Transliteration of content into Latin script.
- Logical flaw detection in scientific writing [17, 18, 11, 19, 20, 21].

To prepare for a thesis defense, it is helpful to use ChatGPT to simulate potential instructor questions and formulate precise answers. The same technique is useful for responding to audience questions after a presentation.

Modern AI technologies assist in writing, editing, and improving texts. They are particularly useful for students, researchers, and anyone working with academic content.

Paperpal helps refine academic papers, fix errors, and enhance writing style, making texts clearer and more aligned with academic standards.

Grammarly checks grammar, punctuation, and style, suggests better wording, and integrates with browsers and text editors.

QuillBot rephrases content, makes it more unique and comprehensible, expands or shortens texts, and corrects mistakes – useful for avoiding plagiarism and clarifying ideas.

ChatGPT assists in idea generation, drafting, summarizing, and answering questions.

Thanks to these tools, writing and editing become easier and more professional. They help eliminate errors and make content clearer [22].

In summary, AI is rapidly becoming an indispensable tool for thesis preparation. It helps students identify relevant topics, quickly organize data, and adapt foreign sources. AI enhances the efficiency of the learning process and improves the quality of academic work. Integrating such technologies into education not only simplifies students' tasks but also encourages new learning and research methods for both students and faculty [23].

When used ethically, AI becomes a powerful ally in producing original, high-quality academic research and a time-saving resource. The key to success lies in balancing routine automation with personal contribution and critical thinking [24].

Despite its significant advantages, the use of AI poses a serious threat to academic integrity. The main issue lies in the strong temptation to generate assignments or research papers using AI and present the output as one's own work. An open question remains: can it be considered ethical to use AI for writing a significant portion of a thesis?

Arguments:

- AI may produce inaccurate or outdated information, which a student might fail to verify.
- Relying on automatically generated text can result in violations of academic integrity, which may have serious consequences for the student.
- Overuse of AI leads to a decline in critical thinking skills.

It is important to remember that AI and its technologies can serve as an invaluable assistant in academic and educational activities. However, it should never replace the student.

Despite numerous advantages, using AI to create presentations comes with its challenges. Based on my own experience, I identify the issue of "excessive automation," where a polished form overshadows personal contribution and deep understanding of the material. On one occasion, when I relied too heavily on automatic content generation, it led to insufficient comprehension of key aspects of the topic.

Moreover, the ethical dimension of using AI is crucial. Modern technologies enable the creation of entire presentations, which raises questions about authorship. It is important to determine whether such work can be considered original. Discussing these issues is essential for establishing ethical and legal norms for AI usage.

5. Conclusions

Artificial intelligence can be a valuable tool in writing bachelor's and master's theses when used responsibly. It assists in finding information, improving text, and automating routine tasks. However, it is important to remember that critical thinking and the student's personal contribution remain key factors in producing high-quality and original academic work. The use of AI should be supportive, not the primary method for writing thesis projects.

Combining AI tools with personal analysis and information verification enables higher education students to create competitive, high-quality, and unique research papers.

Guidelines for students must include the following:

- Use AI as a tool to enhance your own ideas, not as a substitute for critical thinking.
- Practice visualizing technical data using AI tools, which is especially important for presenting threat and vulnerability analysis results.
- Experiment with different AI platforms and models to find those best suited for specific tasks.
- Always specify which AI models you used and for what purpose in your work, adhering to academic integrity.

- Always verify the data, facts, and primary sources provided by AI.
- Avoid copying texts without understanding and adapting them.
- Learn to critically evaluate AI-generated responses and adjust them when necessary.
- Use AI to create compelling and informative presentations.
- Follow the principles of academic integrity when using AI.
- Consult instructors for advice on the capabilities and ethical use of different AI models and tools.
- It's important not only to learn how to use AI tools but also to understand their limitations and possibilities. Students who can effectively combine AI with critical thinking and creativity will have a significant advantage in the future.
- Remember that AI is a powerful tool and assistant in academic and research work, but the responsibility for the content and quality of the presented material always remains with the author.

Declaration on Generative AI

The authors have not employed any Generative AI tools.

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