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#### CHALLENGES IN AI-ASSISTED ACADEMIC WRITING: A CASE STUDY

# YAPAY ZEKA DESTEKLİ AKADEMİK YAZIMDAKİ ZORLUKLAR: BİR VAKA ÇALIŞMASI

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#### Abstract

Artificial Intelligence (AI) has become a widespread tool in various academic fields, offering capabilities that range from machine translation to automated content generation. However, the application of AI in composing academic papers is subjected to inaccuracies, particularly in adhering to the conventional demands of academic writing. Based on a case study methodology, this article examines the limitations of AI in the following key areas: following the conventional rhetorical moves for composing an academic paper, providing accurate citations, arranging references in formats other than APA (unless specifically required to do so), disclosing the corpora, databases, and source texts used for AI training, incorporating contemporary knowledge, understanding cultural contexts beyond the Anglophone sphere, and maintaining a formal writing style. This case study emphasises the necessity for human engagement in academic writing to ensure quality, accuracy, and cultural sensitivity.

**Keywords**: artificial intelligence (AI), academic writing, Large Language Model (LLM)

### Özet

Yapay Zeka (YZ), çeşitli akademik alanlarda yaygın bir araç haline gelmiş olup, makine çevirisinden otomatik içerik üretimine kadar çeşitli yetenekler sunmaktadır. Bununla birlikte, akademik makale yazımında YZ'nin uygulanması, özellikle akademik yazımın geleneksel taleplerine bağlı kalınmasında yanlışlıklara maruz kalmaktadır. Bir vaka çalışması metodolojisine dayanan bu makale, yapay zekanın aşağıdaki kilit alanlardaki sınırlamalarını incelemektedir: akademik bir makale oluşturmak için geleneksel retorik hamleleri takip etmek, doğru alıntılar sağlamak, APA dışındaki formatlarda referanslar düzenlemek (özellikle gerekli olmadıkça)), şirketi, veritabanlarını ve kaynak metinleri ifşa etmek yapay zeka eğitimi, çağdaş bilgiyi birleştirmek, Anglofon alanının ötesindeki kültürel bağlamları anlamak ve resmi bir yazı stilini sürdürmek için kullanılır. Bu vaka çalışması, akademik yazılarda kalite, doğruluk ve kültürel hassasiyetin sağlanması için insan katılımının gerekliliğini vurgulamaktadır. Anahtar Kelimeler: Akademik yazı, kültürel hassasiyet, insan katılımı, kalite, doğruluk.

Anahtar Kelimeler: Yapay zeka (AI), akademik yazı, Büyük Dil Modeli (LLM)

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#### 1. INTRODUCTION

In recent years, AI has had a significant impact on the field of writing and communication. The integration of AI into academic writing has changed the way researchers, educators, and students create verbal content. However, despite its notable capabilities, AI is still in the process of development, particularly concerning the precision required for academic writing. This article explores critical areas where AI is lacking, thereby highlighting the importance of caution and human involvement when employing AI for scholarly purposes.

The research problem addressed in this paper centres on the challenges and limitations of using AI in academic writing, particularly its impact on the accuracy, credibility, and originality of research work. The goal of this research is to critically evaluate these limitations by analysing student term papers from the English Language Department at the National University of Kyiv-Mohyla Academy, Ukraine, which were detected as written with AI assistance. The research employs a case study method, focusing on areas such as structure, citation accuracy, contextual and cultural awareness. The thesis of this paper asserts that while AI tools offer certain benefits, they often fail to maintain the formal standards required for academic writing.

## 2. LITERATURE REVIEW

Recent literature on using AI in academic writing reveals a range of perspectives, highlighting both its benefits and challenges in scholarly work. For instance, Golan, Reddy, Muthigi, and Ramasamy (2023, pp. 327–328) argue that using AI-based tools for scientific writing should widely be adopted. They claim that the use of AI in academic writing offers such advantages as streamlining the research process through efficient data processing, aiding in the identification of hard-to-detect insights, and assisting in organising and presenting data. Additionally, AI can assist the editing process, attending to grammatical and structural revisions. However, the researchers admit that there are significant limitations, e.g., AI-generated content, particularly in sections like the introduction, discussion, and conclusion, often lacks comprehensiveness and may not fully align with the specifics of a study, potentially compromising the depth and accuracy of academic work.

Discussing the potential of AI in ESL education, Thanya, Marudhavel, and Chandramohan (2023) highlight its potential of enhancing and improving instructional efficiency and the student experience. The authors examine how AI can assist with tasks like brainstorming and citation checking, while also acknowledging risks to originality and authorship. They underline the need for scholars to develop the AIED (AI in education) literacy, encompassing application, reliability, and engagement.



On the other hand, they note challenges such as diminished critical thinking and authenticity, and concerns regarding bias, privacy, and the overall nature of scholarly work.

Papakonstantinidis, Kwiatek, and Spathopoulou (2024) reveal through a survey that non-academic professionals view AI writing tools as beneficial for efficiency and content quality, whereas academic writers express concerns about biases, manipulation, and potential job displacement.

Youvan (2024) explores how AI enhances productivity and innovation in research through automated data analysis and simultaneous theory generation, known as the "shotgun approach." The study also focuses on the ethical implications of AI in research, particularly concerning authorship, originality, and the nature of knowledge.

Synthesising recent research, Aljuaid (2024) considers implementation of AI in education and notes that while AI can aid with grammar and style, it does not replace the essential teaching of critical thinking, research, creativity, and ethics inherent in university writing courses.

Building on the insights from the literature review, this research employs a case study method to examine the specific limitations and inaccuracies of AI in academic writing, as observed in student papers.

## 3. METHODS

As the empirical evidence, a case study is used to illustrate specific limitations and inaccuracies of AI observed in student academic papers written with the assistance of the Large Language Models.

This study was conducted as an independent research project focused on the evaluation of student academic papers produced within the English Language Department of the National University of "Kyiv-Mohyla Academy" (NaUKMA), Ukraine.

# 3.1. Data Collection

The data for this study consisted of term papers submitted by undergraduate and graduate students as part of their coursework in linguistic and EFL subjects, representing a range of academic writing tasks. In total, 93 student papers submitted during the 2022-2024 study terms were analyzed. Papers selected for further examination were chosen based on the presumption that they contained AI-generated content, as they showed a striking disparity between the authors' oral and written communication skills. For this case study, one paper was selected to illustrate the range of challenges



faced by a student who over-relied on AI assistance. Excerpts of the work under consideration are provided as screenshots in the Appendices.

## 3.2. Analytical Framework

The analysis was guided by qualitative methodology, with a focus on identifying specific areas where AI assistance in academic writing exhibited errors or inaccuracies. The analysis addressed the following areas:

- 1. **Structure**: The evaluation of whether a student paper follows the conventional rhetorical moves for an academic research paper.
- 2. Citation accuracy and transparency of sources: Assessment of the referencing, correctness, completeness, and consistency of citations in texts presumably generated by the AI, particularly focusing on citation styles other than APA. The presence or absence of information regarding the corpora, databases, and source texts used by the AI in generating content.
- 3. **Incorporation of contemporary knowledge**: Consideration of the extent to which AI-generated content reflects up-to-date information and current social or academic debates.
- 4. **Cultural awareness**: Identification of the degree to which the AI assistants acknowledged cultural contexts beyond the Anglophone sphere.
- 5. **Formal writing style**: The evaluation of whether the AI tools maintained the appropriate academic tone and neutrality expected in scholarly writing.

#### 3.3. Case Study

To examine and illustrate the drawbacks of using AI in academic writing, a case study was conducted with one student paper taken as a representative example. The paper, titled *COMPARATIVE ANALYSIS OF AI-GENERATED AND HUMAN POETRY*, was blindly selected based on its potential reliance on AI tools during the writing process and demonstration of specific errors and deficiencies. The case study involved a qualitative analysis of the paper, identifying and categorising instances of AI-related inaccuracies.

### 3.4. Ethical Considerations

The research adhered to both national and international standards for research and publication ethics. Since the study involved a statistically relevant number of student papers, with one paper selected



blindly, care was taken to ensure that the identities of the students were not disclosed, either explicitly or implicitly. All personal information was anonymized, and any identifying details were removed to maintain confidentiality. As a result, Ethics Committee approval was not required for this study.

## 3.5. Data Analysis

The findings from the case study and the qualitative analysis were synthesised and categorised to draw conclusions about the effectiveness and limitations of using AI assistants in academic writing. The results were compared with existing literature on AI in education to contextualise the findings within broader scholarly discussions.

This methodological approach allowed for an assessment of the role of AI in academic writing, highlighting its significant shortcomings while acknowledging its potential benefits. The inferences gained from this study contribute to the ongoing scholarly discourse on the ethical and practical implications of using AI tools in educational contexts.

## 4. CASE STUDY: Research Findings

Upon reviewing the corpus of students' papers submitted within the two-year time frame during which data and writing samples were gathered, several critical issues were identified that prevented them from being marked with a passing grade. These issues were categorised and analysed based on the following criteria: structure, citation accuracy and transparency of sources, incorporation of contemporary knowledge, cultural awareness, and formal writing style.

#### 4.1. Structure

The reviewed paper structure, as outlined in the *Table of Contents* (Fig. 1), reflects a student's attempt to explore the features of AI-generated poetry, followed by a comparative analysis with human poetry.

However, the *Table of Contents* presented in Fig. 1 reveals significant organisational issues that question the originality and undermine the coherence of the student's research, deviating from the structural requirements of an academic paper. In particular, the outline does not align with the conventional sequence of rhetorical moves expected in academic research; for instance, it lacks the essential sections of methods, results, and discussion. Additionally, the missing literature review, which sometimes forms part of the introduction in essays and articles, in term papers is to be appropriately placed as a separate section.



The outline also shows a lack of balance between the two main sections, as the second section only includes one subpoint. A balanced structure requires that equal attention be given to all parts and subparts, ensuring that each section is developed with sufficient detail. Additionally, subpoints should not be orphaned; for instance, if there is a 2.1, there must be a corresponding 2.2. Otherwise, a single subpoint becomes irrelevant and disrupts the logical flow of the argument.

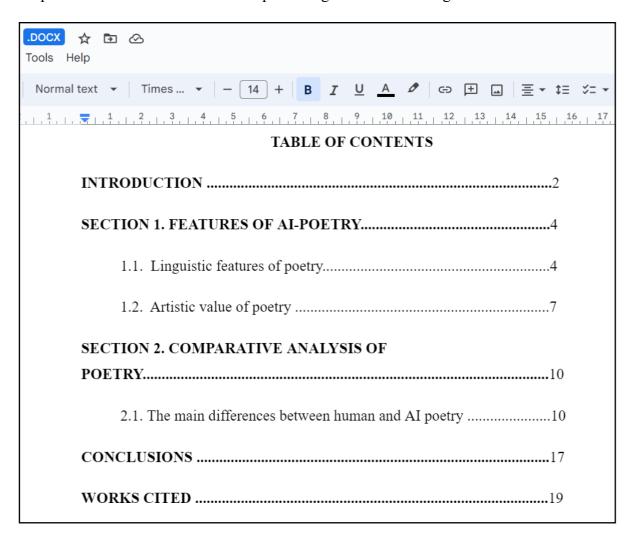


Figure 1. A screenshot of the Table of Contents of a student academic paper under the study

Consequently, failing to substantially support an argument with preceding scholarly research or omitting a systematic methodology description leads to confusion about the study's purpose, credibility, and the relevance of the results obtained.



## 4.2. Citation Accuracy and Transparency of Sources

The paper demonstrates significant issues with citation accuracy and transparency. Several quotes, including those from Shakespeare's *Othello*, lack proper references, hampering the credibility of the work. For example, the quote "*Reputation, reputation, reputation! O, I have lost my reputation!*" is presented without citation, which should have been attributed to Cassio, Act 2 Scene 3.

Additionally, the paper does not adhere to the MLA citation format, which is required by the NaUKMA English Language Department (Pavlenko et al., 2022), and exhibits inconsistencies in using quotation marks (inverted commas vs French Quotes) and formatting block quotes. Algenerated content can sometimes produce formatting that does not align with specific academic standards if not closely monitored. If the text was generated or edited using AI without thorough human review, errors such as inconsistent quotation marks and formatting issues might go unnoticed. This inconsistency often reflects a lack of careful proofreading and manual adjustment.

Furthermore, the AI system that was used to generate the text under study is not identified, making the analysis difficult to replicate or validate. The absence of information regarding the corpora and databases used by the AI also raises concerns about the copyright and the reliability of the findings.

The paper was subjected to a plagiarism check, which returned an acceptable similarity index of 10.2%, reflecting primarily quoted material. However, the AI-detection tool (*AI Content Detector*, 2024) revealed that up to 65% of the content of the paper was AI-generated (see Appendices, Fig. 2a–e). This raises significant concerns about the originality of the work and the responsible use of AI in academic writing. The reliance on the content produced with AI without proper acknowledgment or critical engagement compromises the academic integrity and the paper value.

# 4.3. Incorporation of Contemporary Knowledge

The student intended to compare linguistic characteristics and artistic merits of AI-generated poems with those created by humans, using Shakespeare's works as a reference. However, the paper lacks a clear focus and fuses literary and linguistic analyses, indicating a lack of understanding of the distinct objectives of these two fields.

In addition, the paper lacks a relevant incorporation of contemporary knowledge. While it attempts to compare AI-generated poetry with Shakespeare's work, it fails to contextualise these comparisons within current literary or linguistic debates. The choice of Shakespeare as a comparative figure, without exploring contemporary human poets, reduces the paper's appropriateness, fails to provide a



synchronic approach (from Ancient Greek συν- "together" and χρόνος "time") and thus to consider the language of AI-generated vs human poetry at a current moment in time so as to draw a comprehensive perspective on AI-generated content in the context of human poetic expression.

The paper also claims to use "quantitative methods involving computer linguistics," but no such analysis is presented, further detracting from its academic accuracy.

## 4.4. Cultural Awareness

In addition to lacking contemporary knowledge, the paper does not demonstrate sufficient cultural awareness, particularly in its comparison of AI-generated texts with Shakespeare's work, which belongs to a different cultural and historical context. The student overlooks the importance of comparing AI poetry with contemporary human poets to provide a relevant cultural analysis. This lack of cultural sensitivity results in an inadequate exploration of the differences between AI-generated and human poetry, particularly in terms of their thematic depth and contextual value.

The paper contains instances of unclear writing (here they will be quoted without mentioning the source in a conventional citation way so as to maintain the student's anonymity), such as "Careful use of Shakespearean techniques and Rome adds aesthetic beauty to his poems," where the word 'Rome' should be considered as a machine-assisted (AI) translation error for 'rhyme' (Cf. Ukrainian 'Рим' vs 'рима,' Genitive case 'рим,' which the LLM automatically capitalised, not recognising the lexical difference), which the student overlooked.

Another expression, "conspiratorial characteristics" [sic], applied to human poetry, does not belong to the field of linguistic analysis.

The sentence "Finally, the study aims to contribute to our understanding of the role of artificial intelligence in creation the frequency of this potential for the addition and development of human creativity" contains vocabulary issues and awkward phrasing in "the frequency of this potential," which makes it difficult to understand the intended meaning.

Lastly, the term "artificial decommunism" [sic] is used in the analysed paper without definition or context, making it unclear and confusing. It appears first in the statement, "The key difference between artificial decommunism [sic] and human poetry lies in the originality and artistic intent of the creation" without any reference to the origin of the expression or explanation of its meaning.



These instances illustrate a phenomenon termed as *AI hallucinations*, when a Large Language Model, lacking cultural context, generates patterns or notions that are non-existent, creating inaccurate or nonsensical outputs.

## 4.5. Formal Writing Style

Although AI models can utilise formal language, follow grammatical rules, and produce cohesive sentences, the academic writing style of the paper under the study is compromised by several issues in terminology and coherence, such as the above-mentioned instances of unclear and awkward phrasing and unconventional, unexplained terms like "conspiratorial characteristics" and "artificial decommunism" that are not defined or contextualised, making the text difficult to understand and undermining its credibility. These errors indicate a lack of attention to detail and an insufficient grasp of the formal academic accuracy and clarity required in scholarly writing.

To summarise, the examined paper attempts to explore the features of AI-generated poetry in comparison with human poetry but fails to emphasise that human poetry is inspired by creativity, drawn from personal emotional experiences, cultural and contextual influences, and the complexity of human consciousness in conveying deep meanings and evoking powerful responses. Moreover, despite written remarks and instructions provided upon the submission of the first draft, the paper still suffers from a lack of scholarly focus, improper citation practices, unclear terminology, and issues with formulation. Additionally, the paper should have included a more focused set of examples from both AI systems and contemporary human poets to offer a balanced and culturally grounded analysis. The errors in the paper suggest that AI was used as a writing tool without sufficient close reading by the student, which was confirmed by the AI detection tool (see Appendices).

#### 5. DISCUSSION

#### 5.1. Following the Rhetorical Moves for Composing an Academic Paper

The conducted analysis demonstrates that AI models can produce text with a basic structure, i.e. an introduction, body, and conclusion. However, unless they are specifically prompted to draft an academic paper following the classical rhetorical moves that include a literature review, methods, results, and discussion, they may fail to produce a well-organised and logically coherent academic argument, especially when dealing with complex topics that require cultural and contextual sensitivity and critical thinking skills.



## 5.2. Acknowledging Sources

## **5.2.1. Providing Accurate Citations**

Citations are the basis of academic writing, ensuring that ideas and data are properly grounded and attributed to their original sources. However, AI may generate citations that are either incomplete, incorrect, or entirely fabricated. This is particularly problematic when AI lacks access to real-time databases or specific scholarly sources, leading to citing fake, outdated, or irrelevant references. Moreover, AI-generated citations may not always adhere to the detailed requirements of specific citation styles, resulting in inaccuracies that can jeopardise the credibility of the research.

## 5.2.2. Citing References in Styles Other Than APA

While AI has made progress in automating the citation process, it is often limited to APA style, which is widely used but not universal. Other citation styles, such as MLA, Chicago, or Harvard, each have unique rules and conventions that AI fails to accurately implement. The limitations in AI's ability to adhere to these styles without error highlight a significant shortcoming in its application for diverse academic fields and can lead to formatting errors that diminish the professionalism and accuracy of academic papers.

### 5.2.3. Indicating Corpora, Databases, and Source Texts Used in AI Training

Transparency in academic research includes not only citing sources but also acknowledging the datasets and corpora that inform the research. In the context of AI, this involves disclosing the specific datasets and source texts used to train the model. However, most AI platforms do not provide detailed information about such data, which raises concerns about the transparency and reproducibility of AI-generated content. Without access to this information, researchers and reviewers cannot fully assess the reliability or biases present in the AI's output. This lack of transparency complicates the ethical use of AI in academic writing and highlights the need for open information about AI training data.

## 5.3. Incorporating Contemporary Knowledge

AI's knowledge base is inherently limited by the data and time frame it was trained on, which often excludes the most recent developments in a field. In rapidly evolving disciplines, such as technology, medicine, or social sciences, this lag can result in AI-generated content that is outdated or misaligned with current trends and debates. Researchers relying on AI for the latest insights may find themselves working with information that is no longer relevant, which can negatively impact the validity and



timeliness of their work. This limitation underscores the importance of verifying AI-generated content with regard to up-to-date human research to ensure the accuracy and relevance of academic papers.

## 5.4. Understanding Cultural Contexts Beyond the Anglophone Sphere

Since AI models are predominantly trained on data from English-speaking sources, this leads to a bias towards Anglophone cultural norms and perspectives. This presents a significant challenge when composing academic papers that require an understanding of diverse cultural contexts. AI may inadequately impose cultural frameworks on topics that require an understanding of non-Western perspectives, leading to cultural insensitivity, machine translation errors, or oversimplification of complex issues. The lack of cultural awareness in AI-generated content highlights the need for human supervision to ensure that academic writing is culturally inclusive and respectful of global perspectives.

# 5.5. Following a Formal Writing Style

Academic writing demands a strictly formal and neutral tone, characterised by precise language, objectivity, and clarity. While AI-generated texts often appear fluent and coherent, they frequently lack the features required for maintaining a strictly formal tone. AI may introduce colloquialisms, epithets, biassed language, or informal expressions that disturb the formality expected in scholarly work. Furthermore, AI struggles with appropriately adjusting its tone across different sections of a paper, such as the abstract, literature review, and conclusion. This inconsistency in maintaining a neutral writing style poses a significant risk for researchers over-relying on AI to produce academic content.

## 6. CONCLUSIONS

While AI offers significant potential in aiding academic writing, its current limitations necessitate caution and critical engagement from researchers.

The literature on application of AI in academic writing presents a balanced view of its advantages and disadvantages. On the pro side, AI enhances productivity by accelerating the research process, aiding in data organisation, and improving language accuracy. It helps to brainstorm ideas, structure and revise drafts. However, the cons include significant concerns about reduced critical thinking and authenticity, biases in AI algorithms, potential misuse, and risks to traditional notions of originality, authorship, and academic integrity. Additionally, AI lacks the ability to fully replicate the creativity and contextual understanding required in scholarly work.



The case study presented in this paper highlights such limitations of AI usage as inaccuracies in maintaining a formal writing style, providing accurate citations and disclosing training corpora, switching between citation styles, incorporating contemporary knowledge and acknowledging diverse cultural contexts, all of which point to the need for human engagement in the writing process.

As AI technology continues to evolve, addressing these challenges will be crucial in ensuring that AI can be a reliable and ethical tool for academic writing.

#### 7. APPENDICES

# Screenshots of sample pages containing content generated by AI

The following screenshots (Fig. 2a–e) present samples of AI-generated content in a student's academic paper, as detected by the online tool *AI Detector - Reliable and Detailed Results* (2024). The high probability of AI-generated content was further confirmed by the student's lack of familiarity with the paper's content and the failure during the oral examination.

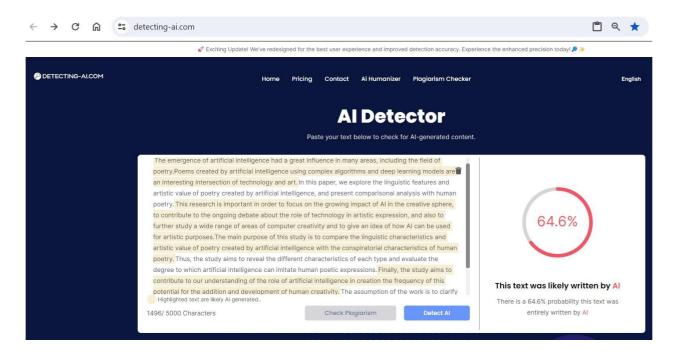


Figure 2a. A sample of predominantly AI-generated content in a student's academic paper.



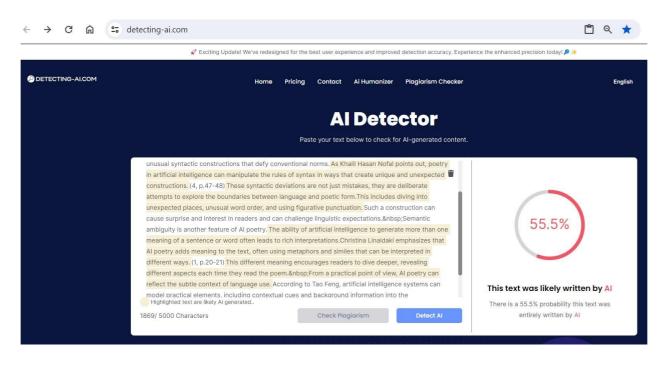


Figure 2b. A sample of predominantly AI-generated content in a student's academic paper.

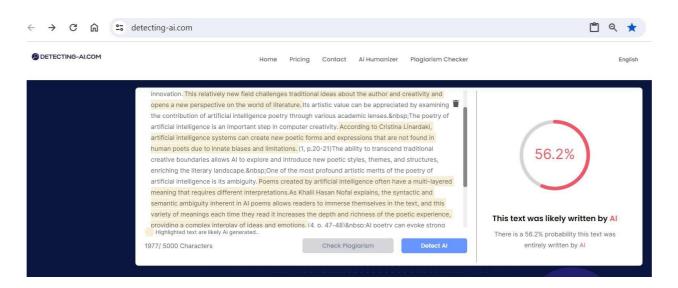


Figure 2c. A sample of predominantly AI-generated content in a student's academic paper.



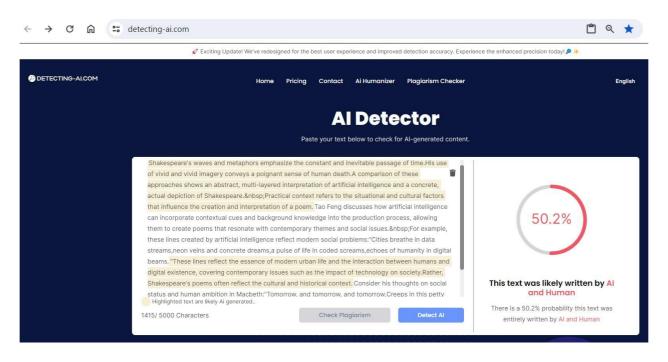


Figure 2d. A sample of a mix of human and AI-generated content in a student's academic paper.

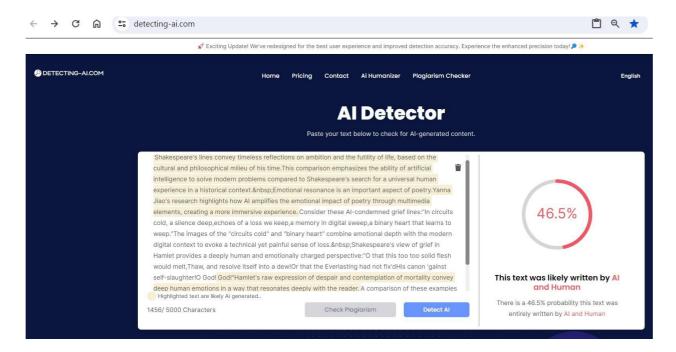


Figure 2e. A sample of a mix of human and AI-generated content in a student's academic paper.



# Acknowledgments

This article has been produced as an independent research based on the analysis of term papers completed within the English Language Department of the National University of "Kyiv-Mohyla Academy," Ukraine. The article complies with national and international research and publication ethics. Ethics Committee permission was not required for the study as the students' identities have not been disclosed.

This text is proofread with *ChatGPT-4* (OpenAI, 2024) to correct non-native English inaccuracies.

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