

Note

THE USE OF ARTIFICIAL INTELLIGENCE IN ACADEMIC PUBLISHING: PRELIMINARY REMARKS AND PERSPECTIVES

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ABSTRACT

Artificial intelligence programs are constantly developing, becoming an increasingly powerful tool for solving various problems. First of all, attempts have been made to use artificial intelligence (AI) to generate new texts, but practice shows that the level of creativity exhibited by these programs is still insufficient for producing substantial articles. Of course, this will not prevent AI programs from developing text, including generation of not only dissimilar text, but capably accomplishing certain conceptual tasks. However, even today, it is possible to use AI programs to solve standard tasks in the preparation, editing, reviewing, processing, and publication of scientific texts. This article will provide an overview of the latest trends in the use of AI programs for academic publishing using examples of several scientific journals. We will look at different levels of AI and their impact on editorial work and review the potential of AI in complementing human input.

Next, we will consider the following stages of working with scientific texts in the editorial offices of scientific journals: author and article registration in the journal system; initial analysis of the article; choice of reviewers; article review; communication with the author regarding received reviews; publication decision; proofreading and publication of work; its registration in database systems.

In the conclusion, we summarise tips for editors on how to use AI.

1 INTRODUCTION

The rapid development of AI and robotics in the modern world opens new horizons of possibilities and has a profound impact on society.¹ AI is poised to become a pivotal factor in our future, unlocking new horizons and opportunities while also freeing up substantial time for more creative and innovative pursuits, but it is crucial to recognise that AI is merely a tool designed to support and enhance human potential. AI itself is an algorithm based on computational information processing and an analytical approach.² Its power lies in its ability to efficiently process complex tasks and provide enhanced human cognition. Thus, AI can greatly facilitate the decision-making process in cases where complex problems need solutions.

However, it is important to note that humans remain indispensable in the context of understanding and managing uncertainty. The distinctiveness of human intelligence lies in encompassed in its integrity and intuitive approach to problem-solving. The idea of "intelligence augmentation" assumes that AI systems should serve to qualitatively enhance human input, not replace it. AI can become an invisible partner of newsrooms, thereby helping to harness the human potential in the most effective and balanced manner.

There are several evolutionary levels of AI, namely:³

1. Artificial Narrow Intelligence (ANI) or weak AI. This AI system excels at certain activities, such as winning at chess, driving a car, etc.
2. Artificial General Intelligence (AGI), also known as powerful AI or human-level AI, is intelligent and capable just like humans. As such, it can learn and work in a way that is no different from humans.
3. Artificial superintelligence (ASI) far exceeds human capabilities and can be defined as "any intelligence that greatly exceeds human cognitive capabilities in virtually all domains of interest."⁴

ANI is already becoming evident. For example, it is used in self-driving cars, voice interaction (e.g., Siri/Cortana), recommendations (e.g., on Amazon or Facebook), automatic translation

1 Margaret A Goralski and Tay Keong Tan, 'Artificial Intelligence and Sustainable Development' (2020) 18(1) *The International Journal of Management Education* 100330, doi:10.1016/j.ijme.2019.100330; Andreas Kaplan and Michael Haenlein, 'Rulers of the World, Unite! The Challenges and Opportunities of Artificial Intelligence' (2020) 63(1) *Business Horizons* 37, doi:10.1016/j.bushor.2019.09.003; Vincent C Müller and Nick Bostrom, 'Future Progress in Artificial Intelligence: A Survey of Expert Opinion' in VC Müller (ed), *Fundamental Issues of Artificial Intelligence* (Synthese Library 376, Springer 2016) 555, doi:10.1007/978-3-319-26485-1_33.

2 Christoph Lutz, 'Digital Inequalities in the Age of Artificial Intelligence and Big Data' (2019) 1(2) *Human Behavior and Emerging Technologies* 141, doi:10.1002/hbe2.140.

3 Nick Bostrom and Eliezer Yudkowsky, 'The Ethics of Artificial Intelligence' in K Frankish and W Ramsey (eds), *The Cambridge Handbook of Artificial Intelligence* (CUP 2014) ch 15, 316, doi:10.1017/CBO9781139046855.020.

4 Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (repr, CUP 2016) 22.

(Google Translate), and in more advanced programs, as was demonstrated in recent years with AlphaGo, AlphaZero, and AlphaFold from Deep Mind. Even though we still live in an era of ANI, the next level, AGI, may not be too far in the future.

2 POTENTIAL APPLICATIONS OF AI IN VARIOUS PROCESSES OF ACADEMIC PUBLISHING, ESPECIALLY KNOWLEDGE EXCHANGE

Here are the following opportunities created with the help of AI systems:

- a) a combination of people working on the same problems;
- b) facilitation of shared intelligence and shared organisational memory;
- c) creation of a comprehensive view of knowledge sources and bottlenecks;
- d) creation of more coordinated, connected systems within organisational levels;
- e) facilitation of feedback and peer review of communication systems (e.g., Slack);
- f) facilitation of smart sharing in real time.

AI systems can also generate dynamic social graphs that capture the relationships between people and teams to provide a complete perspective on knowledge sources and bottlenecks.

During each of these stages, AI programs can provide valuable assistance to the editorial staff in various ways.

2.1. Author and Manuscript Registration (Validation) in the Journal System

Considering some individuals' potential desire to check the integrity of the journal by registering fake authors, AI can search for information about a given author and fill in their profile with publication history. Of course, this only refers to the automation of the search in the pre-defined database of publications and the presentation of information in a standardised form, as well as warning about a possible fraudulent type of data submission.

2.2. Initial Analysis of the Manuscript

In the second stage, the manuscript itself is checked. It should be determined whether the manuscript is relevant to the aim and scope of the academic/scholarly journal, whether its formatting and structure generally meet the set requirements, whether it does not contain overlaps/plagiarism, and whether the classifiers of the work are correctly provided. These tasks are relatively straightforward from the point of view of implementation. For this, you should use any AI program that supports an API (Application Programming Interface). This allows granting access to the manuscript from the journal management system to the AI program. The AI can provide answers to some pre-defined questions:

1. Does the topic of the work coincide with those specified for the academic/scholarly journal?

2. Are the Journal Economic Literature Classifications (JELs) correctly indicated in the content of the manuscript?
3. Are the formatting and all structural elements of the manuscript in accordance with the requirements on the journal's website?
4. Does the grammar and work style meet generally accepted standards?
5. Were AI programs used to paraphrase the text or form new text in the manuscript?

Ethical issues are steadily arising in the upcoming era of AI – authorship, initially. Today, scientists can use not only ChatGPT for certain text generation, but also AI platforms such as:

- a) ChatABC:⁵ is the best ChatGPT program with features like team collaboration, a fast library, seamless service, and more. It provides the ability to download documents and use voice.
- b) Paperpal:⁶ The perfect writing tool for academics. It is a machine-learning writing assistant designed to help users write high-quality academic manuscripts in minutes. It provides real-time tips and feedback to improve your writing skills and integrates with Microsoft Word, making it easy to use for those familiar with the popular word-processing software.⁷
- c) Consensus:⁸ This is a GPT-4-based function that summarises the responses of scientific studies. Consensus uses AI to search for answers in scientific manuscripts. The best way to search for information is to ask the right scientific question.
- d) Scite_⁹: It is ChatGPT for science. It uses 1.2b citation statements extracted and analysed from over 33m full-text manuscripts.
- e) QuillBot:¹⁰ It has a ChatGPT generator. Its text features range from changing words with synonyms using a thesaurus to changing the structure of a sentence by permuting the sentence. It also displays readability statistics, so you know how QuillBot has improved your writing.
- f) In turn, to check whether the text has been partially or fully generated by AI, the editorial office can use many conventionally-named anti-AI programs.¹¹ Some include:
 - 1) GLTR¹²: The program uses a simple but effective way of analysing texts.
 - 2) GPT-2 Output Detector:¹³ Makes it possible to detect structural features characteristic of AI within texts.

5 *ChatABC* <<https://chatabc.ai>> accessed 20 June 2023.

6 *Paperpal* <<https://paperpal.com>> accessed 20 June 2023.

7 A Gasparini and H Kautonen, 'AI-Based Tools' (*Doria*, March 2023) <<https://www.doria.fi/bitstream/handle/10024/186899/AI-based-tools-2023-03.pdf?sequence=1&isAllowed=y>> accessed 30 May 2023.

8 *Consensus* <<https://consensus.app>> accessed 20 June 2023.

9 *Scite* <<https://scite.ai>> accessed 30 May 2023.

10 *QuillBot* <<https://quillbot.com>> accessed 30 May 2023.

11 Natalya Kyryk, 'Catch the Robot: Services for Checking Texts for Artificial Intelligence' (*WordFactory*, 2022) <<https://wordfactory.ua/gpt-chat-detector>> accessed 30 May 2023.

12 *GLTR* <<http://gltr.io>> accessed 30 May 2023.

13 *GPT-2 Output Detector* <<https://openai-openai-detector--2fqjw.hf.space>> accessed 30 May 2023.

- 3) GPT Radar:¹⁴ Details its findings and provides an integrated assessment.
- 4) Hive Moderation:¹⁵ Promises verification of texts in less than 200 ms (0.2 seconds) with 99% accuracy.

2.3. Is there no Plagiarism in the Work?

To ensure a lack of plagiarism, the AI program must be integrated with the journal's existing plagiarism-checking system. The integrated system can automatically perform the plagiarism check and provide a preliminary conclusion.

It is obvious that such formalisation of the work requires certain programming on the part of the editor at the current stage, but the output will be a proposal to the editor-in-chief for further consideration of the work, or its rejection with a letter prepared accordingly by the AI program.¹⁶

2.4. Selection of Reviewers

As a rule, the editor selects reviewers who, in their subject area, have specified either the same topic or the same JELs as those selected in the paper itself. At the same time, the editor does not always remember all the particular reviewer's fields to send him/her a work to review, especially over a long period in which the scientific interests of the reviewer can change with time. It is obvious that the AI program is tasked with determining the most relevant experts for reviewing, based on the database of reviewers and the database of previous reviews. Also, if the reviewer rejects or declines the invitation, the AI program can independently choose a replacement. So, AI may determine (suggest) a list of potential reviewers based on their scores (determined by the editor), history of reviewing (last review date), and semantic analysis of reviewed text and matching with keywords/publication records in reviewers' profiles (especially a task for AI). In case of overdue review, the program should independently notify the reviewer about this and, in case of further violation, select an appropriate replacement.

14 GPT Radar <<https://gptradar.com> > accessed 30 May 2023.

15 Hive Moderation <<https://hivemoderation.com>> accessed 30 May 2023.

16 Mohammad Khalil and Erkan Er, 'Will ChatGPT get you caught? Rethinking of Plagiarism Detection' (*arXiv:2302.04335*, 8 February 2023) doi:10.48550/arXiv.2302.04335; György Molnár and Cserkó József, 'AI Based Plagiarism Checking: Ease of use and applicable system for teachers to find similarities in students' assessments' (2022 IEEE 5th International Conference and Workshop Óbuda on Electrical and Power Engineering (CANDO-EPE), Budapest, Hungary, 21-22 November 2022) 187, doi:10.1109/CANDO-EPE57516.2022.10046379; Catherine A Gao and others, 'Comparing Scientific Abstracts Generated by ChatGPT to Original Abstracts Using an Artificial Intelligence Output Detector, Plagiarism Detector, and Blinded Human Reviewers' (2023) 6(1) NPJ Digital Medicine 75, doi:10.1101/2022.12.23.521610.

2.5. Manuscript Review

Upon receipt of all necessary reviews, the AI program can prepare an email regarding the further fate of the manuscript based on the number of potential publications, the quality of the reviews, and the quality of other submitted works. This will allow the editor to receive a ranking of all submitted manuscripts, which will allow the selection of the best manuscripts without relying on the submission time priority. Considering that in peer-reviewed journals, each publication usually goes through several rounds of review, automation and ranking of manuscripts can be useful for the editors.

2.6. Communication with the Author Regarding Received Reviews

During all stages of communication with the author, AI programs allow you to create personalised letters instead of built-in unsubscribes, which are provided in all journal management systems. At the same time, there is a risk that the authors' letters will also be formed by AI software.

2.7. Decision on Publication

As already mentioned above, the AI program can form a rating of each submitted work based on the received reviews. This task is based on the possible complementarity of people and AI in decision-making situations, which are typically characterised by uncertainty, complexity, and ambiguity (Tab. 1).¹⁷ However, this rating can be based on sensitive text analysis that is already successfully used in machine learning systems. When building the skeleton of the next issue, the AI program may be given additional tasks regarding the selection of works, based not only on the rating but also on other parameters, particularly the number of publications from one country, the total amount of papers per issue, etc.

Table 1. The scheme of AI integration in decision-making

Task	Human	AI
Uncertainty	Make swift intuitive decisions in the face of the unknown	Provide access to “real-time” information (e.g., anomaly detection)
Complexity	Decide where to seek and gather data, choose among options with equal data support	Collect, curate, process, and analyse data
Equivocality	Negotiate, build consensus, and rally support	Analyse sentiments and represent diverse interpretation

17 Created by authors based on Mohammad Hossein Jarrahi, ‘Artificial Intelligence and the Future of Work: Human-AI Symbiosis in Organizational Decision Making’ (2018) 61(4) *Business Horizons* 577, doi:10.1016/j.bushor.2018.03.007.

2.8. Proofreading and Publication of Work and its Registration in Database Systems

At the final stage, AI software can perform almost automatic communication for the final proofreading of the text as well as consolidate the final consent for publication. After the manuscript is accepted and the version of the record is published, the AI software automatically registers the manuscript in all necessary databases and integrates the badge into the manuscripts on OJS (Fig. 1). Such AI software makes it possible to increase the visibility of the author and his/her results, and, accordingly, to increase the journal's impact. Another AI-related task is to develop a banner to promote the manuscript. Currently, AI programs can create images and banners based on textual analysis of the manuscript itself.¹⁸

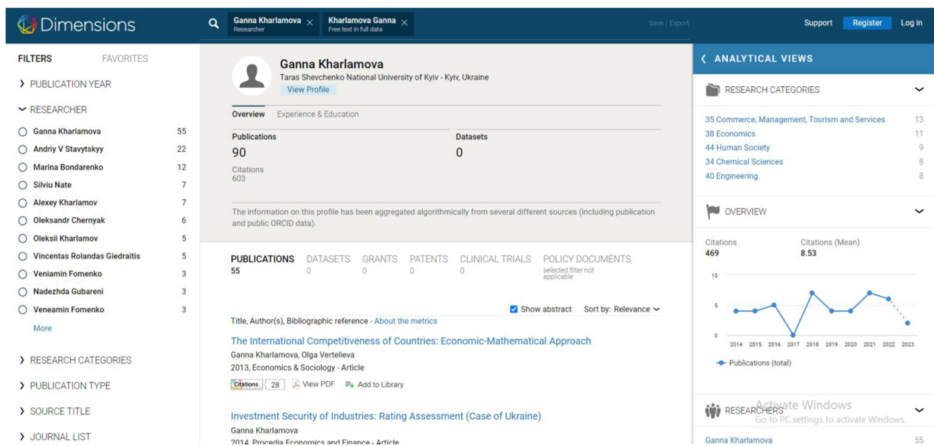


Figure 1. Dimensions.ai badge (example of Ganna Kharlamova's profile)

In this way, AI can streamline the content creation process, including automatic translation, grammar checking, and formatting rules, allowing publishing teams to focus on combining quality and quantity when creating content. AI systems can also generate dynamic social graphs that capture the relationships between people and teams to provide a complete perspective on knowledge sources. It should be noted that AI programs are not yet ready to fully adopt these tasks, especially in terms of integration with other programs, such as plagiarism checkers. However, this is easily solved by creating small programs. For example, in Python, standard libraries can be used to communicate between programs.

18 Marian Mazzone and Ahmed Elgammal, 'Art, Creativity, and the Potential of Artificial Intelligence' (2019) 8(1) Arts 26, doi:10.3390/arts8010026.

However, along with highlighting the advantages of AI, we should mention the main disadvantages as well:

- 1) AI systems often struggle with grasping the nuanced and contextual aspects of language. While they can perform automated tasks, like grammar and spell-checking, they may not fully comprehend the intended meaning, tone, or cultural nuances of the content. This limitation can result in inaccuracies, misinterpretations, or inappropriate suggestions. So, the necessity of a human review is still vital.¹⁹
- 2) AI models are trained on large datasets that may contain inherent biases present in the data. As a result, AI systems can inadvertently perpetuate or amplify existing biases, including gender, racial, or cultural biases, in the editorial process. This can lead to biased language suggestions, unfair content selection, or skewed perspectives, which can have negative societal implications. So, the editors cannot fully rely on AI systems.²⁰ The use of AI in editorial processes raises ethical considerations regarding accountability for errors or biased content. When AI systems are involved in content creation or editing, it can be challenging to assign responsibility for any misinformation, inappropriate suggestions, or biased content as the decision-making process is automated and may lack transparency.
- 3) Still, and especially in "predatory" or not physical editorial offices, the automation of certain editorial tasks through AI can lead to concerns about job displacement for human editors. While AI can streamline and enhance efficiency, it may also lead to workforce reductions and job losses in the editorial industry, potentially impacting employment opportunities and livelihoods.²¹
- 4) The concerns as to the authorship of papers.²²

However, it's important to note that these disadvantages do not imply that AI should not be used in editorial processes. Instead, they highlight the need for careful considerations, human oversight, and continuous improvements to ensure that AI systems are used

19 Ahmed Tlili, Daniel Burgos, and Chee-Kit Looi, 'Guest Editorial: Creating Computational Thinkers for the Artificial Intelligence Era-Catalyzing the Process through Educational Technology' (2023) 26(2) *Educational Technology & Society* 94, doi:10.30191/ETS.202304_26(2).0007; Xiaoxu Ling and Siyuan Yan, 'Let's be Fair. What about an AI editor?' [2023] *Accountability in Research* 1, doi:10.1080/08989621.2023.2223997.

20 Donghee Shin and Kerk F Kee, 'Editorial Note for Special Issue on AI and Fake News, Mis(dis)information, and Algorithmic Bias' (2023) 67(3) *Journal of Broadcasting & Electronic Media* 241, doi:10.1080/0888381.51.2023.2225665.

21 Shashank Awasthi and others (eds), *Artificial Intelligence for a Sustainable Industry 4.0* (Springer Intern Pub 2021).

22 Joseph Crawford and others, 'Artificial Intelligence and Authorship Editor Policy: ChatGPT, Bard Bing AI, and beyond' (2023) 20(5) *Journal of University Teaching & Learning Practice* 1, doi:10.53761/1.20.5.01; Seong Ho Park and others, 'Ethical Challenges Regarding Artificial Intelligence in Medicine from the Perspective of Scientific Editing and Peer Review' (2019) 6(2) *Science Editing* 91, doi:10.6087/kcse.164.

responsibly, ethically, and in conjunction with human expertise to mitigate these challenges. Additionally, we overlook the challenges of integrating AI software with journal management systems. Still, we should admit²³ and acknowledge that some tasks can be successfully handled by functions of existing journal management systems without the need for AI, e.g., manuscript submission and tracking; peer review management; editorial workflow management (however, we foresee the integration of AI in this process to better synthesise it with other user services, even outside the editorial process); content management (like DOI, etc.); user access and permissions. So, while AI can enhance certain aspects of journal management systems, such as automated plagiarism detection or reviewer recommendation systems, the core functions mentioned above can be performed effectively without AI. These functions primarily rely on well-designed user interfaces, databases, and workflow management tools to streamline the editorial process and enhance efficiency.

3 CONCLUSIONS

In general, all current uses of AI in the publishing industry involve a machine or deep learning, either alone or in combination with other technologies, such as natural language processing (NLP), voice recognition, or computer vision.

Key theses:

- 1) AI only complements knowledge management in editorial offices;
- 2) AI systems can only imitate human knowledge and editorial functions;
- 3) AI offers opportunities for extending computing power, information processing, and analytical capabilities.

AI is a significant advancement in editorial functions where acceleration is needed and possibly assist with significant cost savings:

- checking for plagiarism;
- checking grammar and style;
- providing accurate information and fact-checking;
- reviewing (desk review);
- formatting and reference formatting;
- generating a banner for promotion.

The paper concludes that AI can streamline the content creation process, including automatic translation, grammar checking, and formatting rules, allowing publishing teams to focus on combining quality and quantity when creating content. However, AI and publishing will inevitably clash over copyright. AI can be complicit in the piracy of copyrighted works.

23 Okyay Kaynak, 'The golden age of Artificial Intelligence: Inaugural Editorial' (2021) 1 *Discover Artificial Intelligence* 1, doi:10.1007/s44163-021-00009-x.

The symbiosis between editorial management platforms and AI can open new opportunities for content creation, optimisation, and distribution. AI can be used in editorial platforms to improve efficiency and quality of work.

Editorial management platforms can integrate AI to provide automated content processing and analysis. AI can detect and correct errors, improve the structure and content's organisation, and provide an automatic selection of relevant keywords and tags. This makes it possible to increase the efficiency of the editorial process and ensure high-quality content.

In addition, AI can be used to support the distribution of content on various platforms and communication channels. It can analyse data about the audience, account for their interests and behaviour, and, based on this, recommend optimal channels and content distribution strategies. This helps to reach a wider audience and increases the effectiveness of communication.

Thus, the symbiosis of editorial management platforms and AI can improve the processes of content creation and distribution, ensuring greater efficiency and high quality. The integration of AI into editorial platforms is becoming an important step in the development of the media industry and helps to solve complex tasks related to the processing and management of a large amount of content.

In summarisation, the following are tips for editors to better use AI:

- 1) **Opportunities:** Understanding the potential of AI will allow editorial offices to use it more effectively to improve their work.
- 2) **Manuscript quality:** Using AI to automatically check spelling, grammar, and the style of texts. This will help ensure high-quality content and reduce the likelihood of errors.
- 3) **Optimising processes:** Automating routine tasks, such as identifying keywords, categorising materials, or translating texts. This will allow editors to save time and focus on more complex tasks.
- 4) **Personalisation of content:** Analysis of user activity and recommendations of individualised content will potentially lead to increasing the impact of the text.
- 5) **Analytics:** Analysing data about the audience of readers, including their interest in certain content, popular topics, and trends. This will help invite authors to meet the needs of scientific trends and increase the impact of the issue.
- 6) **Automatic news monitoring:** Monitoring of news sources and automatic detection of scientific trends and brand markers. This will make it possible to quickly respond to urgent scientific gaps and distribute manuscripts with a high level of citation.
- 7) **Improve SEO:** Using AI algorithms to analyse keywords, competition, and search engine popularity. This will help optimise your content for better search engine rankings.

- 8) Automatic image recognition: Help to process and categorise large volumes of photo and video material faster, thus verifying the validity of references and ensuring academic integrity.
- 9) Forecasting: Predicting popularity and response to different types of content. This will make it possible to understand what content is most interesting for the publication's audience.
- 10) Ethics of use: Compliance with ethical standards is essential. Ensuring transparency, confidentiality, and fairness are important aspects of using AI in editorial processes.

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АНОТАЦІЯ УКРАЇНСЬКОЮ МОВОЮ

Нотатка

ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ В АКАДЕМІЧНИХ ВИДАННЯХ: ПОПЕРЕДНІ ЗАУВАЖЕННЯ ТА ПЕРСПЕКТИВИ

Ганна Харламова* та Андрій Ставицький

АНОТАЦІЯ

Програми штучного інтелекту постійно розвиваються і стають все більш потужним інструментом для вирішення різноманітних завдань. Перш за все, були зроблені спроби використати штучний інтелект (ШІ) для генерації нових текстів, але практика показує, що рівень креативності цих програм усе ще недостатній для створення змістовних статей. Звісно, це не завадить програмам ШІ розробляти текст, у тому числі генерувати не тільки несхожий текст, але здатний виконувати певні концептуальні завдання. Проте вже сьогодні є можливість використовувати програми ШІ для вирішення стандартних завдань із підготовки, редагування, рецензування, обробки та публікації наукових текстів. У цій статті буде здійснено огляд останніх тенденцій у використанні програм ШІ для академічних видань на прикладі кількох наукових журналів. Ми розглянемо різні рівні ШІ та їх вплив на редакційну роботу, а також проаналізуємо потенціал ШІ в доповненні людського внеску.

Далі розглянемо такі етапи роботи з науковими текстами в редакціях наукових журналів: реєстрація автора та статті в системі журналу; первинний аналіз статті; вибір рецензентів; рецензування статті; спілкування з автором щодо отриманих рецензій; рішення про публікацію; коректура та публікація роботи; її реєстрація в системах баз даних.

У висновку ми узагальнюємо поради для редакторів щодо використання ШІ.

Ключові слова: *штучний інтелект, редактори, редакційний менеджмент, академічне видання, дослідницька доброчесність, відкрита наука, Україна.*