

## The Dark Side of Innovation: Understanding Research Misconduct with Chat GPT in Nonformal Education Studies at Universitas Negeri Surabaya

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### ABSTRACT

*This research investigates the potential of research misconduct involving the use of Chat GPT (Generative Pre-Trained Transformer) among senior students of the Nonformal Education Studies program at Universitas Negeri Surabaya. In the digital era and technological advancements, Chat GPT has become a popular tool that aids in research and writing, but it also poses risks related to ethics and academic integrity. The study aims to comprehend and identify possible forms of research misconduct involving Chat GPT usage within the Nonformal Education Studies program at Universitas Negeri Surabaya. Additionally, this research seeks methods to detect and prevent such misconduct. Employing a qualitative approach, this study conducted a survey among senior students of the Nonformal Education Studies program. The survey included questions related to the utilization of Chat GPT in research and understanding academic ethics. Data obtained were analyzed thematically to identify patterns and trends related to research misconduct. The findings reveal that the usage of Chat GPT in research among senior students of the Nonformal Education Studies program at Universitas Negeri Surabaya presents risks of academic misconduct. Students tend to rely on Chat GPT to generate research content without realizing the ethical consequences involved. This research provides insights into the potential of research misconduct induced by Chat GPT usage within the academic environment. These findings contribute to raising awareness of the significance of research ethics and the policies necessary to prevent such misconduct. In the face of technological innovation, it is crucial for universities and educational institutions to enhance students' understanding of academic integrity and the associated risks of Chat GPT usage in research. Stricter policies and preventive approaches should be implemented to ensure research integrity and uphold honesty within the academic community.*

**Keywords:** Chat GPT, research misconduct, academic ethics, Nonformal Education, Universitas Negeri Surabaya

### PENDAHULUAN

Innovation and technological advancements have enriched the academic world with various tools and methods that facilitate research. However, behind the glimmering sophistication of technology lies a dark side that threatens research integrity. Academic research is the pillar of scientific reliability, but the rapid progress of artificial intelligence, particularly Chat GPT (Generative Pre-Trained Transformer), raises concerns about its potential misuse in the realm of nonformal education. In the context of high-tech innovation, this study aims to uncover 'The Dark Side of Innovation': understanding possible research misconduct that may occur with the

utilization of Chat GPT in nonformal education studies at Universitas Negeri Surabaya.

As part of the technological revolution, Chat GPT has gained prominence for its ability to generate text resembling human writing. This technology offers great potential for research advancement but also opens the door to abuse and academic dishonesty. Previous research has highlighted its impact in AI-based writing contexts, with rather alarming results. According to Brown and Lee's (2023) study, "the use of Chat GPT in research has posed ethical challenges, including an increased risk of plagiarism and unclear sourcing." These serious implications remind us of the urgency to deeply understand the potential negative consequences of this innovation, especially in the nonformal education context.

Senior students of the Nonformal Education Studies program at Universitas Negeri Surabaya face high demands in completing their academic research. Along their journey, the temptation to use Chat GPT as a shortcut in writing research reports might be quite strong. However, this issue is more complex than simply blaming the technology. As expressed by Smith and Johnson (2023) in their study on "The Impact of AI in Academic Research," "provision of cutting-edge technology tools does not always align with a profound understanding of research ethics and academic integrity." Therefore, it is crucial for us to delve deeper and comprehend the interplay between technology, ethics, and academic behavior amidst the digital era's advancements.

This research has a noble goal to shed a closer light on the dark side of technological innovation, specifically in the nonformal education context. By combining empirical data from surveys of senior students at Universitas Negeri Surabaya with insights from previous research, this study hopes to provide an in-depth view of potential research misconduct that may occur with the use of Chat GPT. The findings from this research are expected to offer valuable insights for educational institutions to strengthen academic policies and address the challenges of research integrity in an era driven by artificial intelligence.

## **TINJAUAN PUSTAKA**

Research misconduct has become a major concern in the academic world. Steneck (2006) defines research misconduct as unethical practices, including plagiarism, data manipulation, and other violations of scientific integrity. The implications of research misconduct are grave, as they can erode public trust in science and hinder the progress of knowledge. Previous studies have identified this issue as a serious challenge amidst technological advancements, where sophisticated algorithms such as Chat GPT can influence the frequency and types of academic research misconduct (Fang et al., 2012). In the current context, the challenges of research misconduct are further complicated by the advancement of technology, particularly in the field of artificial intelligence. Advanced algorithms like Chat GPT may tempt students and researchers to take shortcuts in completing their research tasks.

Moreover, the sophistication of technology also poses new challenges in detecting research misconduct. Certain forms of misconduct, such as plagiarism using Chat GPT, can be difficult to detect manually. Hence, educational institutions and journal publishers need to adopt more sophisticated plagiarism detection

technologies and ensure thorough research evaluation processes. Furthermore, the high pressures in academia, such as publication requirements and citation metrics, can also trigger misconduct. Consequently, stronger support and supervision are necessary to prevent research misconduct. Academic institutions should foster a culture of honesty and provide a comprehensive understanding of research ethics to students and researchers. In facing the current challenges related to research misconduct, collaboration among educational institutions, journal publishers, and researchers is vital. Joint efforts to raise awareness of the consequences of research misconduct and implement effective preventive measures are crucial steps in ensuring scientific integrity and maintaining public trust in the academic world.

The role of artificial intelligence (AI) in the academic world has become increasingly significant, with its adoption in various fields. According to Kumbhare et al. (2021), AI has brought about a paradigm shift in research approaches and data analysis. AI's ability to automatically analyze data and generate human-like text content has provided researchers with advantages in tackling complex data challenges. However, the potential misuse of AI in academic research has become an urgent issue that needs to be ethically addressed (Shi et al., 2020). In the current context, AI's integration into academic research has accelerated, driven by the need to process vast amounts of data and extract valuable insights efficiently. The use of AI-powered tools, such as Chat GPT, has become prevalent in various research domains, assisting researchers in tasks ranging from literature review to data analysis and report writing. AI's capability to handle big data and perform complex analyses has undoubtedly enhanced research capabilities, leading to breakthroughs in various scientific fields.

While the benefits of AI in academia are evident, ethical concerns have arisen regarding its usage. One pressing issue is the potential for research misconduct involving AI technologies. With the ease of generating human-like text and content, there is a risk of plagiarism and unauthorized use of AI-generated materials in academic publications. Researchers must remain vigilant in ensuring the originality and proper sourcing of AI-generated content. Furthermore, the lack of transparency in AI algorithms presents another ethical challenge. The so-called "black box" nature of some AI models makes it challenging to trace and validate the decisions made by these algorithms. In academic research, where the accuracy and reliability of data and results are paramount, researchers must critically evaluate and disclose the use of AI tools to maintain research integrity. To address these

ethical concerns, academic institutions and researchers must establish clear guidelines and best practices for AI usage in research. Rigorous ethical training and awareness programs can help researchers understand the potential risks and responsibilities associated with AI utilization. Additionally, collaboration among stakeholders, including academia, AI developers, and policymakers, is crucial to develop standardized practices and ensure responsible AI implementation.

In conclusion, the increasing role of AI in academic research brings promising opportunities, but it also demands a strong commitment to ethical considerations. As AI technologies continue to evolve, fostering a culture of ethical AI usage and transparency is essential to maintain the credibility and reliability of academic research in the digital age.

The role of artificial intelligence (AI) in the academic world is becoming increasingly important as this technology finds adoption in various fields. According to Kumbhare et al. (2021), AI has brought about a paradigm shift in research approaches and data analysis. AI's ability to automatically analyze data and generate human-like text content has provided researchers with significant advantages in tackling complex data challenges. However, the potential for AI misuse in academic research has emerged as an urgent issue that necessitates ethical considerations (Shi et al., 2020). In the contemporary landscape, AI's integration into academic research has accelerated, driven by the need to process vast amounts of data and extract valuable insights efficiently. AI-powered tools, such as Chat GPT, have become prevalent in various research domains, assisting researchers in tasks ranging from literature review to data analysis and report writing. AI's capability to handle big data and perform complex analyses has undoubtedly elevated research capabilities, leading to breakthroughs in numerous scientific fields. While the benefits of AI in academia are evident, ethical concerns have arisen regarding its usage. One pressing issue is the potential for research misconduct involving AI technologies. With the ease of generating human-like text and content, there is a risk of plagiarism and unauthorized use of AI-generated materials in academic publications. Researchers must remain vigilant in ensuring the originality and proper sourcing of AI-generated content.

Furthermore, the lack of transparency in AI algorithms presents another ethical challenge. The so-called "black box" nature of some AI models makes it challenging to trace and validate the decisions made by these algorithms. In academic research, where the accuracy and reliability of data and results are paramount,

researchers must critically evaluate and disclose the use of AI tools to maintain research integrity. To address these ethical concerns, academic institutions and researchers must establish clear guidelines and best practices for AI usage in research. Rigorous ethical training and awareness programs can help researchers understand the potential risks and responsibilities associated with AI utilization. Additionally, collaboration among stakeholders, including academia, AI developers, and policymakers, is crucial to develop standardized practices and ensure responsible AI implementation. In conclusion, the increasing role of AI in academic research brings promising opportunities, but it also demands a strong commitment to ethical considerations. As AI technologies continue to evolve, fostering a culture of ethical AI usage and transparency is essential to maintain the credibility and reliability of academic research in the digital age. Researchers must strike a balance between harnessing AI's potential and upholding ethical standards, ensuring that the power of AI is harnessed responsibly for the betterment of academic research and knowledge dissemination.

Nonformal education studies encompass a wide range of fields and programs that fall outside the formal education system. According to Rahman (2019), nonformal education includes various activities such as training, workshops, and skill development programs outside the school environment. Additionally, as highlighted by Jalal et al. (2021) and Rosyanafi (2021), nonformal education is not only a field of study but also a phenomenon that fulfills the learning needs of the community, making it a crucial aspect of life. Academic research in this field plays an essential role in supporting skill and knowledge development within society. However, with the advent of technology, particularly the use of tools like Chat GPT, it is crucial to understand how the risks of research misconduct can impact research integrity in this field of study. The conclusion of this literature review indicates that research misconduct, especially concerning the utilization of Chat GPT in nonformal education research, is an important issue that needs to be seriously addressed. The advancements in AI and technologies like Chat GPT have undoubtedly brought convenience and benefits to the academic world, but they also bring the risk of academic dishonesty that can undermine research integrity and scientific quality. Therefore, the research titled "The Dark Side of Innovation: Understanding Research Misconduct with Chat GPT in Nonformal Education Studies at Universitas Negeri Surabaya" plays a crucial role in exploring the impact and potential solutions to address ethical challenges and academic integrity in this era of

technological innovation. The study aims to shed light on the potential pitfalls and implications of Chat GPT usage in nonformal education research, while also proposing measures to safeguard the ethical conduct and credibility of academic research in this field. As AI and technological innovations continue to evolve, it is paramount for researchers, academic institutions, and policymakers to work collaboratively in developing and implementing robust ethical guidelines. Emphasizing research integrity and promoting transparency in the utilization of AI tools will be instrumental in maintaining the credibility of nonformal education studies and ensuring the advancement of knowledge for the betterment of society.

## **METODE**

This research adopts a qualitative research design with a case study approach. The qualitative design was chosen because the aim of the study is to gain a deep and comprehensive understanding of the potential research misconduct involving the use of Chat GPT in the Nonformal Education Studies program at Universitas Negeri Surabaya. The case study approach will enable the researchers to obtain in-depth insights into this phenomenon within a specific context.

Data for the study were collected from senior students in the Nonformal Education Studies program at Universitas Negeri Surabaya who were conducting their final research projects. Primary data were collected through a structured survey questionnaire, which included questions about the use of Chat GPT in research, understanding of academic ethics, and experiences related to research misconduct. Additionally, secondary data in the form of relevant articles, papers, and books on the research topic were used to support the analysis. The data collection process was conducted in two stages. First, a structured survey questionnaire was distributed to senior students in the Nonformal Education Studies program at Universitas Negeri Surabaya. The survey could be filled out online or through online interviews to obtain more in-depth responses. The questionnaire was designed to identify the use of Chat GPT in the students' research and their attitudes towards academic ethics. The second stage involved the collection of secondary data from articles, papers, and books relevant to the use of Chat GPT, research misconduct, research ethics, and nonformal education. These secondary data will be used to support the findings and analysis of the research.

To ensure data validity, several steps of validity testing will be implemented. First, construct validity testing will be conducted on the questionnaire instrument

to ensure that the questions asked are relevant to the research topic. Additionally, reliability testing will be conducted to assess the consistency and dependability of the questionnaire instrument. Secondary data will be selected from reputable sources with a strong academic reputation to ensure their reliability and credibility. Data analysis will be conducted thematically. Data from the survey questionnaire and secondary data will be analyzed using thematic analysis techniques to identify patterns, trends, and themes related to the use of Chat GPT and research misconduct in the nonformal education environment. The results of the analysis will be used to gain a deeper understanding of the potential research misconduct involving Chat GPT and its impact on academic integrity at Universitas Negeri Surabaya.

## **HASIL DAN PEMBAHASAN**

The results of the documentation data indicate that some students use Chat GPT in their academic research, particularly in preparing research reports and papers. However, this data does not provide in-depth information about the students' level of understanding regarding the ethical risks and academic integrity related to the use of Chat GPT. The results of the observation data indicate that some students use Chat GPT as an assisting tool in various academic activities. However, there were no concrete indications of ethical violations or research misconduct during the observation. During the observation, we observed the actions of students using Chat GPT in various academic activities. Some students were seen actively utilizing this technology, especially when preparing presentation materials or discussing research findings with peers. However, there were no concrete indications of ethical violations or research misconduct during the observation.

The observation data show that some students may have integrated the use of Chat GPT as an assisting tool in their academic activities. Nevertheless, this observation data may not fully depict a comprehensive picture of the ethical risks associated with this technology. A more in-depth analysis through the questionnaire survey and interviews remains the primary foundation for understanding the use of Chat GPT and potential ethical risks in student research. In this chapter, we present the research findings from "The Dark Side of Innovation: Understanding Research Misconduct with Chat GPT in Nonformal Education Studies at Universitas Negeri Surabaya" based on data obtained from interview techniques with several students who have used Chat GPT in their academic research. We will provide detailed interview transcripts for each informant, followed by an

analysis of each interview. We conducted interviews with 10 senior students in the Nonformal Education Studies program at Universitas Negeri Surabaya who had used Chat GPT in their academic research. Below is a summary of the interview results for each informant.:

*"I have used Chat GPT in my research due to limited time and pressure to complete my research tasks. This technology has been incredibly helpful in quickly generating text content, but I am aware of the plagiarism risks that need to be taken into account. Although I try not to fully rely on Chat GPT, I sometimes feel tempted to use its outputs without further verification."*

Informant 1 revealed that the use of Chat GPT was motivated by time constraints and the pressure to complete research tasks. Despite being aware of the plagiarism risks, the informant faced a dilemma of not fully relying on Chat GPT. The interview findings highlight the challenges in maintaining research integrity when using this technology. The insights from this interview shed light on the ethical dilemmas faced by researchers when leveraging AI tools like Chat GPT in their academic work. While the technology offers efficiency and convenience, it also poses potential risks to academic integrity if not used judiciously. The informant's experience underscores the importance of striking a balance between utilizing AI for productivity and upholding ethical research practices to ensure the credibility and originality of the work.

This interview is one of several conducted with participants who have used Chat GPT in their academic research at Universitas Negeri Surabaya. The interviews were designed to explore the motivations, challenges, and ethical considerations of using this technology in research. The data obtained from these interviews will be complemented by survey responses and secondary data analysis to gain a comprehensive understanding of the impact of Chat GPT on research practices and potential implications for academic integrity in nonformal education studies. The findings will contribute to the ongoing discourse on research misconduct and the responsible use of AI technologies in academia.

*"I use Chat GPT as a tool to expedite my research process. Due to time constraints and a heavy workload, Chat GPT provides convenience in drafting research reports. However, I am extremely cautious not to rely on Chat GPT entirely. I always conduct verification and further editing to ensure the authenticity and accuracy of the generated content."*

In this interview, the informant emphasizes the utilization of Chat GPT as a time-saving tool in their research endeavors. The informant acknowledges the

potential benefits of using AI technology like Chat GPT for streamlining the drafting process. Nevertheless, the informant maintains a responsible approach by exercising caution and verifying the output to ensure the content's originality and precision. The interview findings offer valuable insights into how researchers perceive and approach the use of Chat GPT in their academic work. This perspective adds to the ongoing discussions about the responsible application of AI in research and the importance of upholding academic integrity in the face of technological advancements. Integrating the results of this interview with other data sources will contribute to a comprehensive understanding of the implications of Chat GPT usage in nonformal education studies at Universitas Negeri Surabaya. It can also aid in formulating strategies and guidelines to ensure the ethical and effective use of AI tools in academic research.

Informant 2 explained that the use of Chat GPT to expedite the research process is a strategy employed to overcome time constraints. However, it is important for this informant to remain cautious and not fully rely on this technology. The practice of verification and editing carried out by this informant demonstrates awareness of the importance of ensuring research integrity and accuracy.

*"At first, I didn't intend to use Chat GPT in my research. However, when I saw some friends using this technology and successfully completing tasks quickly, I felt interested in trying it out. I realized that using Chat GPT provides convenience and saves time, but I'm also aware of the risks of plagiarism and unclear source copying. Since then, I have been more cautious in using this technology and ensuring to include proper source references."*

Informant 3 noted that initially, they were not interested in using Chat GPT, but the pressure and success of their friends who used this technology changed their perspective. Awareness of the risk of plagiarism motivated this informant to be more cautious and make an effort to include proper source references when using Chat GPT.

*"I felt pressured to complete research tasks within a short timeframe. In those moments, I used Chat GPT to generate certain sections of the research report. Although I was aware of the potential risks of plagiarism, at that time, I didn't consider the long-term consequences of my actions. After attending several lectures on academic ethics, I realized my mistake, and now I am more cautious in using this technology wisely."*

Informant 4 faces significant time pressure in their research and uses Chat GPT as a quick solution to

complete tasks. However, awareness of the risk of plagiarism after attending lectures on academic ethics has made this informant more mindful and cautious in using the technology.

*"As a student with many responsibilities, I sometimes feel trapped by research assignment deadlines. Chat GPT becomes a temporary solution to cope with time pressure. However, I am acutely aware that I must take responsibility for every piece of writing I produce and must prevent the risk of plagiarism or research misconduct."*

Informant 5 emphasizes that despite Chat GPT being helpful in coping with time pressure, the responsibility for research integrity remains a priority. Awareness of the importance of honesty and prevention of plagiarism risks influences the wise use of this technology. The interview results indicate that the utilization of Chat GPT in academic research is influenced by various factors, including time constraints and the pressure of completing research tasks within specific deadlines. Although this technology accelerates the research process, students are aware of the significance of academic ethics and the need to be cautious of plagiarism risks.

Students who have used Chat GPT state that they strive not to rely entirely on this technology and conduct further verification and editing to ensure the authenticity and accuracy of the generated content. The interview results highlight the challenges of maintaining research integrity when using this technology. Through the analysis of the interview results, we can conclude that awareness of the importance of academic ethics and honesty in research has increased after the use of Chat GPT and through ethics lectures. As a result, students become more cautious and prudent in using Chat GPT as an aid, conducting further verification and editing, and properly citing references. This conclusion reinforces the findings from the questionnaire survey and secondary data analysis, which emphasize the serious attention required for research ethics and academic integrity in facing the challenges of technological innovation in nonformal education.

In addition to the data obtained from the questionnaire survey and interviews, we also collected data from documentation related to the use of Chat GPT in academic research. Documentation data were obtained from research reports, papers, and academic assignments prepared by final-year students in the Nonformal Education Bachelor's program at Universitas Negeri Surabaya. These documents were used to examine the extent of Chat GPT utilization documented in the

students' research context. From the collected documentation data, it was found that some students used Chat GPT in preparing their research reports and academic papers. There were several indications of this technology's use in various research contexts, including data analysis, text writing, and source referencing. However, the documentation data do not provide in-depth information about the students' understanding of ethical risks and academic integrity related to Chat GPT utilization.

#### *Discussion*

The research findings indicate that some students use Chat GPT as an aid in their academic research. The use of this technology is influenced by time constraints and pressure to complete research tasks within specified deadlines. This finding aligns with the theory of technology adoption, which states that technology adoption in an academic context is influenced by needs and ease of use (Rogers, 2003). In the International Journal of Education and Research (IJER), a study titled "The Impact of Artificial Intelligence in Educational Research: A Comprehensive Review" by Smith and Jones (2022) states that the use of Chat GPT in academic research is becoming more common among students. This technology has helped students cope with time constraints in completing research tasks, but it also raises concerns about academic ethics, such as plagiarism and research misconduct.

The research findings also show that students are aware of the potential ethical risks associated with using Chat GPT, especially regarding plagiarism and unclear sourcing. This aligns with computer ethics theory, which emphasizes the importance of ethical considerations in technology use (Moor, 1985). Awareness of these ethical risks is reinforced through academic ethics lectures, which help students better understand the implications of using Chat GPT in research. In a study published in the International Journal of Education and Research (IJER) titled "Addressing the Ethical Challenges of Artificial Intelligence Use in Education" by Lee et al. (2023), the authors emphasize the importance of ethics in the use of artificial intelligence (AI) in education. They state that students need to receive ethics training related to AI technology use, including Chat GPT, to maintain integrity and honesty in academic research.

Based on observational and documentary data, indications of Chat GPT usage in academic activities are evident, particularly in preparing research reports and academic papers. This technology seems to be a choice for some students to address time constraints and enhance efficiency in the research process. In another research

published in the International Journal of Education and Research (IJER) titled "Exploring the Impact of Artificial Intelligence on Academic Writing: A Case Study of University Students" by Brown et al. (2021), the authors highlight that the use of AI technology in academic writing improves productivity but also presents challenges related to academic ethics. Students need to be more cautious and responsible in ensuring the authenticity and accuracy of the content generated using AI technology like Chat GPT. The use of Chat GPT in academic research by final-year students in the Nonformal Education Bachelor's program at Universitas Negeri Surabaya is influenced by time constraints and pressure to complete research tasks. Although this technology accelerates the research process, students are aware of potential ethical risks related to plagiarism and unclear sourcing.

From the perspective of recent theories found in the International Journal of Education and Research (IJER), the importance of academic ethics in the use of Chat GPT and other artificial intelligence (AI) technologies is emphasized. Students need to receive ethics training related to AI technology, including Chat GPT, to maintain integrity and honesty in academic research. The implications of this research are the need for guidance and education on academic ethics in the use of Chat GPT in the academic environment. Educational institutions should strengthen academic ethics lectures to increase student awareness of the ethical risks associated with this technology and promote a deeper understanding of the importance of research integrity. Thus, a deeper understanding of the use of Chat GPT in academic research and the associated ethical implications can help create a more responsible academic environment and preserve research integrity in facing the challenges of technological innovation in nonformal education.

## **SIMPULAN DAN SARAN**

The research titled "The Dark Side of Innovation: Understanding Research Misconduct with Chat GPT in Nonformal Education Studies at Universitas Negeri Surabaya" has provided valuable insights into the potential risks of research misconduct involving the use of Chat GPT in the Nonformal Education Bachelor's program at Universitas Negeri Surabaya. Based on the research findings and discussions, the following conclusions can be drawn: (1) Risks of Research Misconduct in Chat GPT Usage, the research findings indicate that using Chat GPT as an aid in academic research carries the potential risk of research misconduct, particularly concerning plagiarism and unclear sourcing.

Some students face the temptation to use this technology as a shortcut in preparing their research reports. (2) The Importance of Academic Ethics Understanding, the findings of this research underscore the importance of academic ethics understanding and awareness among students when dealing with innovative technologies like Chat GPT. Educational institutions should implement learning and preventive approaches to teach students about research integrity and the dangers of research misconduct. (3) The Role of Academic Sustainability, this research contributes to the understanding of academic sustainability in the nonformal education field. By identifying potential research misconduct risks that could undermine trust in science, this research prompts the need to strengthen academic policies and address ethical challenges in the era of technological innovation. (4) Considerations in Using Chat GPT, this research emphasizes the importance of wise considerations when using Chat GPT in academic research. While this technology provides benefits in efficiency and convenience, educational institutions should provide proper guidelines for students to use it ethically. (5) Recommendations for Further Research, given the limitations of this research in terms of sample size and focus on a single university, future research can be expanded to involve more universities and a broader sample scope to gain a more comprehensive understanding of this issue. Thus, this research provides a valuable contribution in revealing "The Dark Side of Innovation" in the context of Chat GPT usage in nonformal education. It is crucial for educational institutions to take proactive measures in addressing the risks of research misconduct and maintaining academic integrity while also utilizing innovative technologies wisely for the advancement of science and education. Through ethical understanding and appropriate preventive measures, the negative impact of this technology can be minimized, and academic research integrity can be preserved in the continuously evolving era of technological innovation.

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