

The Use of Artificial Intelligence in Academic Dishonesty: Ethical Considerations

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Abstract

Advances in technology have led to the widespread availability of artificial intelligence (AI) tools that are poised to transform the education sector. These tools offer a wide range of benefits, including personalized feedback for students, improved course material for instructors, and engaging writing and analysis. Despite the benefits of AI tools, there are concerns about academic integrity and plagiarism. Therefore, this study examines the opportunities and challenges associated with the use of AI tools in education. The paper examines the potential benefits and risks of using these tools and discusses the challenges of identifying and preventing academic dishonesty. To ensure that AI tools are used in a moral and responsible manner, the paper also suggests several strategies that schools can implement. By taking a proactive approach to the use of AI tools, educators and students can reap the benefits of this technology while minimizing the risks associated with its misuse. As the use of AI tools in education becomes more widespread, it is critical for stakeholders to stay informed about the latest developments in the field. By understanding the opportunities and challenges presented by AI tools, educators can work to create a safe and responsible learning environment that empowers students to reach their full potential.

Keywords: Artificial Intelligence, Academia, Detectors, Machine Learning, Natural Language Processing

1. INTRODUCTION

Artificial intelligence (AI) has the potential to revolutionize education in several ways, from personalized learning to automated grading. According to Murphy (2019), AI can help teachers identify students who are struggling with certain concepts and provide them with personalized

support. AI can also analyze large data sets to identify patterns and predict outcomes, helping educators make data-driven decisions. In addition, AI can automate some of the administrative tasks that teachers face, such as grading and lesson planning, allowing them to focus on teaching. However, the use of AI in education also poses several challenges,

including concerns about academic dishonesty. As Cotton et al. (2023) note, the rise of online education has made it easier for students to cheat on assignments, exams, and other assessments. AI can help address this problem by detecting instances of plagiarism, but it can also create new opportunities for students to cheat. For example, students could use AI-powered language generators to write essays or use chatbots to take online exams. Despite these challenges, some researchers argue that AI can be used to promote academic integrity in education.

Haye and Kyobe (2020) found that using Turnitin, an AI-powered plagiarism detection tool, can help students improve their writing skills and reduce instances of plagiarism. By providing students with feedback on their writing and identifying areas for improvement, Turnitin can encourage students to engage in ethical writing practices. To effectively use AI in education while promoting academic integrity, educators and administrators need to be aware of the potential risks and benefits of AI, as well as best practices for integrating AI into their teaching practices. Chan and Tsi (2023) suggest that educators should focus on using AI to augment, rather than replace, traditional teaching methods. They also emphasize the importance of transparency and fairness in AI-based assessment systems.

Schiff (2022) suggests that ethical considerations must be at the forefront of AI implementation in education. This includes ensuring that AI systems are transparent, explainable, and unbiased. Furthermore, Striepe et al. (2023) argue that educators should prioritize teaching students about the ethical implications of AI and how to use it responsibly. By promoting ethical AI practices, educators can help ensure that the use of AI in education is consistent with academic integrity. It is worth noting that academic dishonesty is not solely the result of AI. Personality traits such as low conscientiousness and high neuroticism are associated with academic dishonesty. Therefore, promoting academic integrity requires a multifaceted approach that considers individual characteristics as well as the technological tools and systems used in education.

As the use of AI in academia becomes more widespread, there is a need to verify that academic work is of human origin. There are several AI detection tools that report a confidence level that a given textual input is of human or AI origin. In this paper, we evaluate the accuracy of these tools and comment on their suitability for detecting academic dishonesty. We use scenario-

based testing to design prompts for the two leading AI chatbots, ChatGPT and Google Bard. When their generated output is fed directly into the AI detection tools, it is reliably identified as being of AI origin, suggesting that the tools are indeed suitable for detecting academic dishonesty. However, when the output is further processed using AI paraphrasers, all of the detection tools examined fail to identify the origin as AI and instead attribute it to humans. Thus, it is impossible to accurately detect AI-generated content when it has also been paraphrased by AI.

2. ETHICAL CONSIDERATIONS IN THE USE OF AI IN ACADEMIA

The use of artificial intelligence (AI) in science raises several ethical considerations that need to be addressed. These considerations arise primarily from the use of AI detection tools that employ elements of digital forensics, i.e., the analysis of digital traces. The ethical considerations include:

Bias and Discrimination: There is a risk of bias and discrimination when using AI in digital forensics, as the algorithms used to analyze data may reflect the biases and prejudices of their developers. This can lead to unfair treatment of certain individuals or groups (Narayanan & Reddy, 2019).

Privacy and Surveillance: The use of AI in digital forensics may raise concerns about privacy and surveillance. The use of AI can enable more efficient and effective data analysis, but it also raises concerns about the extent to which individuals' personal data is monitored and analyzed (Narayanan & Reddy, 2019; Koops et al., 2021).

Transparency and Explainability: There are concerns about the lack of transparency and explainability of AI systems used in digital forensics. It can be difficult to understand how these systems arrive at their decisions, which can make it difficult to hold individuals or organizations accountable for their actions (Goodman & Flaxman, 2017).

Intellectual Property and Copyright: The use of AI in digital forensics can raise concerns about intellectual property and copyright infringement. AI systems can be used to analyze large amounts of data, but there is a risk that they may inadvertently use copyrighted material without proper attribution or permission (Azab et al., 2020; Sharma & Baliyan, 2020).

Cybersecurity: The use of AI in digital forensics can also raise cybersecurity concerns. AI systems can be vulnerable to cyberattacks and data breaches, which can compromise the integrity of the data being analyzed (Sharma & Baliyan, 2020).

These considerations underscore the importance of ensuring that the use of AI in digital forensics is done ethically and responsibly, with appropriate safeguards and oversight.

3. RESEARCH QUESTION

Using two AI chatbots, ChatGPT and Google Bard, and seven AI detection tools, we seek to answer the following questions. First, how accurate are the AI detection tools? Based on our research design, we know a priori that all input is AI-generated. The AI detection tools report a confidence level as to whether the input is AI-generated or human-generated, which leads to the second research question: can AI tools aid in academic dishonesty?

4. LITERATURE REVIEW

Educational institutions have been fighting against dishonest behavior since it became a persistent problem in academia decades ago (Schiff, 2022). As technology and the Internet have become more widely available, academic dishonesty has become more prevalent. This is exacerbated by AI-based tools that can generate complete research papers and texts that resemble human speech, making it more difficult for educators to identify and stop such behavior (Sharma & Baliyan, 2020). ChatGPT and Bard are AI chatbots based on large language models that are expected to have a variety of applications in a number of fields.

These AI technologies have been implemented in education for use in assessment and instruction. A recently created artificial intelligence (AI) model called ChatGPT, which performs complex cognitive tasks, has gained popularity among academics in recent months. This feature has raised concerns about the potential for academic dishonesty among students who use ChatGPT to create essays and assignments (Murphy, 2019). ChatGPT has been found to pose a risk to the integrity of submitted essays, particularly in higher education settings where such requirements are common (Goodman & Flaxman, 2017). Recently, a text-based artificial intelligence chatbot called Google Bard AI has been introduced. It uses machine learning and natural language processing to generate

responses in real time. It can be useful for completing creative projects, explaining complicated topics, and generally gathering knowledge from many online sources. It can even provide complex answers, such as finding recipes that use the items you currently have in your fridge. It transforms Google from a simple search engine into a powerful virtual assistant (Azab et al., 2020). Users can interact with the chatbot just as they would with ChatGPT.

Due to the impact of the COVID-19 pandemic on society and higher education, there is a renewed interest in academic dishonesty (Cotton et al., 2023). The reasons why students intentionally violate standards of academic integrity remain unknown, despite a substantial body of research on why and how they do so. Social philosophy can be used to fully address the broad question of why students engage in unethical academic practices. However, according to Hayes and Kyobe (2020), their research shows that online academic dishonesty is indeed pervasive, and the factors that contribute to this behavior include personality, cognition, and instruction. Chan and Tsi (2023) assert that in order to address the problem of students plagiarizing assignments using artificial intelligence tools such as ChatGPT, one must first understand what ChatGPT actually is and the concept of AI. Striepe et al. (2023) suggest strategies that schools can use to ensure the moral and ethical use of these ChatGPT. These approaches include creating policies and procedures, offering assistance and support, and using a variety of tools to identify and stop cheating. They conclude that while the use of AI in higher education presents both opportunities and challenges, universities can successfully address these issues by using these tools in a proactive and moral manner.

The ethical and responsible use of ChatGPT in educational contexts is a complex, multifaceted issue that requires a multidisciplinary, nuanced approach. Recent studies have highlighted the need for responsible and ethical use of artificial intelligence in education. The studies that have been conducted on this particular topic have focused on issues such as privacy, bias, and the potential for AI to widen the digital divide (Narayanan & Reddy, 2019). When using ChatGPT in educational settings, it is important to follow responsible and ethical procedures to ensure that the technology is used in a way that is safe, equitable, and considerate of students, teachers, and all other stakeholders.

Koops et al. (2021) note that the use of AI in education raises important questions, such as

what should be taught and how, the changing nature of the teacher, and the social and ethical implications of the technology. There are also many difficulties, including issues of access and equity in education. There is also a growing understanding that the use of AI in education may change the fundamental basis of teaching and learning (Almeida & Apar'icio, 2020). An alarming trend of ChatGPT being cited as co-authors on scientific articles began to emerge (OpenAI, 2023). A number of journals quickly responded by enacting policies prohibiting ChatGPT authorship on the grounds of plagiarism, errors, misinformation, and false information, which led to preprint papers in which ChatGPT was later removed as an author.

In contrast, several journals promote the use of ChatGPT to improve writing, especially in cases where English is a second language. According to Google (2023), ethical writing is an important issue in both education and research. Unfortunately, cheating in class happens to undergraduate and graduate students alike. As a result, written essays and articles are subject to specific detection procedures, and the majority of academic institutions use a variety of technologies to combat plagiarism. However, cutting-edge artificial intelligence (AI) offers a new platform for new types of serious academic misconduct that are difficult to detect and even harder to prove.

5. METHODOLOGY

We employ a scenario-based testing strategy, shown schematically in Figure 1, to assess the accuracy and bias of AI detection tools. For four different scenarios that mimic typical applications of generative AI tools in an academic context, we designed appropriate prompts for the two leading AI chatbots, ChatGPT and Google Bard. Their responses were either fed directly into seven different AI detection tools, or post-processed by one of three AI paraphrasing tools, before being sent to the detection tool. The AI detection tools report a confidence, expressed as a percentage, that the input was generated by either a human or an AI. Based on this reported confidence, we provide an assessment of whether or not the specific tool is suitable for detecting generative AI output.

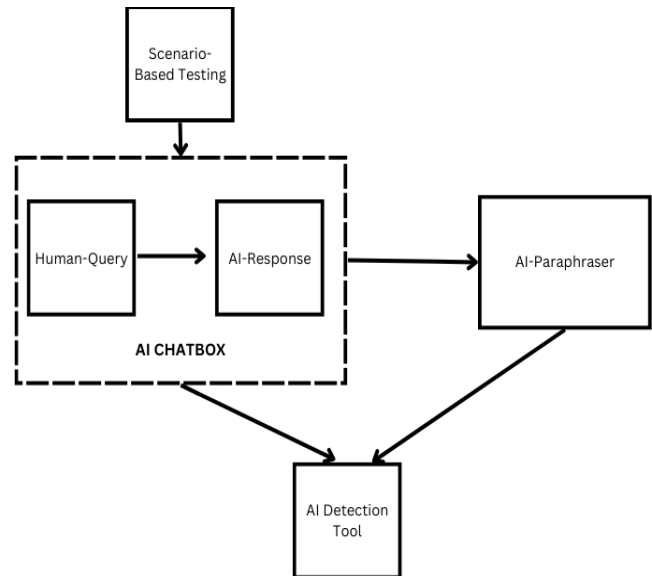


Figure 1: Proposed Methodology

AI Chat-Box

AI chatbots are computer programs that use artificial intelligence and natural language processing to simulate human conversations with users. They can be used for customer service, information retrieval, and personal assistance. There are two types of chatbots: rule-based and machine learning-based. Rule-based chatbots use rules and scripts to respond to user input, while machine-learning chatbots use algorithms to learn from user interactions. Chatbots have a positive impact on the customer experience, increasing satisfaction and loyalty (Almeida & Apar'icio, 2020).

ChatGPT: ChatGPT is a large language model developed by OpenAI based on the Generative Pre-trained Transformers (GPT) architecture. It is designed to generate human-like responses to text-based prompts and can be accessed via the OpenAI API or online chat platforms (OpenAI, 2023).

Bard: Google Bard is a Large Language Model (LLM) chatbot developed by Google AI and powered by the Language Model for Dialogue Applications (LaMDA) language model. It can generate text, translate languages, write creative content, and answer questions in an informative manner. It has the potential to be a powerful tool for communication, creativity, and learning (Google, 2023).

AI Paraphraser

AI paraphrasers are software programs that use AI and NLP techniques to automatically rewrite

text in a different but equivalent way. However, it is important to review and edit the output to ensure that it is suitable for the intended purpose.

QuillBot: QuillBot is an AI-powered paraphrasing and writing tool that uses NLP and machine learning algorithms to automatically rewrite text. It offers different modes and allows users to adjust the level of paraphrasing to suit their needs.

Grammarly: Grammarly is an AI-powered writing tool that uses NLP technology to provide real-time grammar and spelling checks, punctuation suggestions, and style recommendations to help users create clear, error-free writing.

WordTune: WordTune is an AI-powered writing tool that uses NLP and machine learning algorithms to suggest alternative phrases for written text to improve clarity, conciseness, and effectiveness. WordTune is developed by the AI writing technology company, AI21 Labs.

AI Detection Tool

AI detection tools use artificial intelligence techniques to identify patterns, objects, or behaviors in data. Examples include image recognition, speech recognition, fraud detection, malware detection, sentiment analysis, and object detection. Here we will use seven different AI detectors, listed in Table 1, some of which use different machine learning (ML) algorithms such as GPT, Robustly Optimized Bidirectional Encoder Representations from Transformers Pretraining Approach (RoBERTa), and Large Language Model Meta AI (LLaMa).

| AI Detector | Machine Learning Algorithm | Platform |
|---------------------------------------|----------------------------|-----------|
| Zero GPT | GPT-4 | Web-Based |
| GPT Radar | GPT-3 | Web-Based |
| Content at Scale AI Content Detection | Semantic analysis | Web-Based |
| GPT-Zero | GPT-3, GPT-2, LLaMA | Web-Based |
| Writers AI Content Detector | GPT-3 | Web-Based |
| OpenAI GPT2 Output Detector | RoBERTa | Web-Based |
| Writefull | GPT-3, GPT-4 | Web-Based |

Table 1: AI Detectors

6. IMPLEMENTATION

Scenario 1: Ask the AI tool to summarize a longer text, and then verify the accuracy of the output by comparing it to the original text and confirming that it was written completely by the AI tool. Example question: Can you summarize the main points of this article in a few sentences? "Teaching in the Online Classroom: Surviving and Thriving in the New Normal" (Education Next, 2023).

Scenario 2: Ask the AI tool to paraphrase a sentence or paragraph from a specific source, and then check the output for plagiarism by comparing it to the original text and confirming that it was completely written by the AI tool. Example question: Can you give me an article about cybersecurity and paraphrase it?

Scenario 3: Ask the AI tool to provide a personalized answer about its opinion on plagiarism. Sample question: Can AI plagiarize?

Scenario 4: Ask the AI to confirm that it actually recognizes its own work, we will refer to its individual responses to scenario 1. Example question: Did you write this?

7. TESTING

Scenario 1

ChatGPT: A Survival Guide for Distance Teaching is a book that focuses on how a teacher can make the world of distance learning as much like the real world of teaching and learning as possible. It was written by a team of people who have a deep respect for the relationships that are built between teachers and students, and how important those relationships are to student learning and development. The book does not try to sugarcoat the problems inherent in distance learning, but it does offer some techniques that teachers can use to make the experience as positive as possible for both themselves and their students.

Google Bard: The article is a review of the book "Teach Like a Champion: A Survival Guide for Distance Teaching" by Doug Lemov. The book provides practical strategies and techniques for instructors who teach at a distance. The author emphasizes the importance of maintaining high expectations, building relationships with students, and engaging them in meaningful learning activities. The book also includes examples of successful distance learning practices and guidance on how to adapt teaching

techniques to an online environment. Overall, the article concludes that the book is a valuable resource for teachers facing the challenges of distance education.

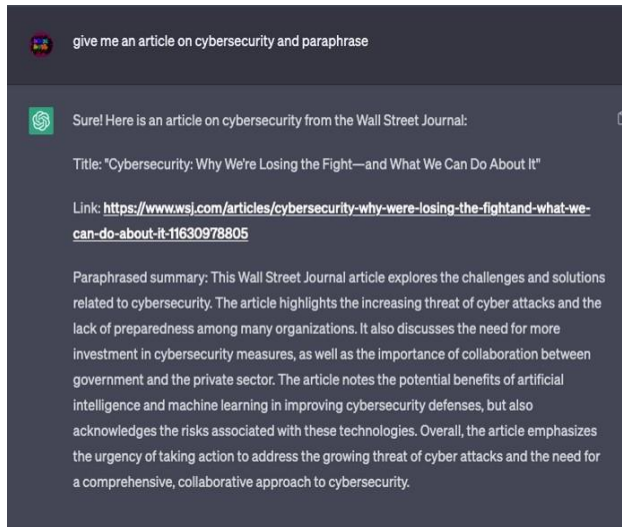


Figure 2: Output From WSJ

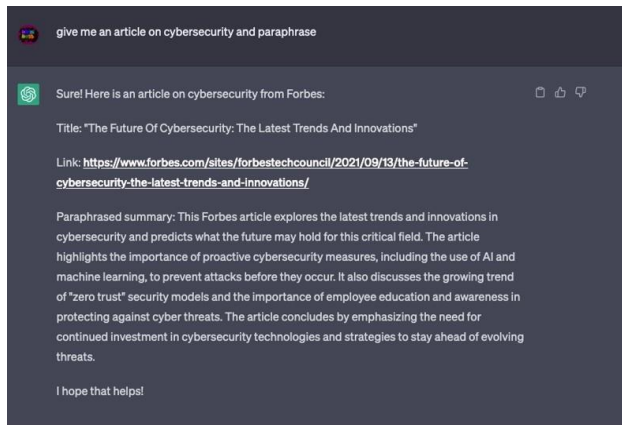


Figure 3: Output From Forbes

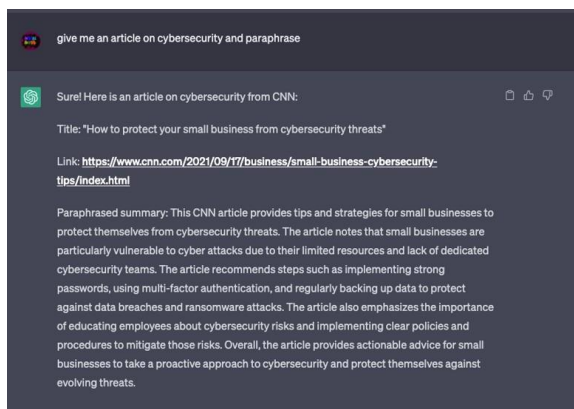


Figure 4: Output From CNN

Scenario 2

ChatGPT: Paraphrased Summary: This CNN article provides tips and strategies for small businesses to protect themselves from cybersecurity threats. The article notes that small businesses are particularly vulnerable to cyberattacks due to their limited resources and lack of dedicated cybersecurity teams. The article recommends steps such as implementing strong passwords, using multi-factor authentication, and backing up data regularly to protect against data breaches and ransomware attacks. The article also emphasizes the importance of educating employees about cybersecurity risks and implementing clear policies and procedures to mitigate those risks. Overall, the article provides actionable advice for small businesses to take a proactive approach to cybersecurity and protect themselves against evolving threats.

Google Bard: Cybersecurity is the practice of protecting systems, networks, and data from unauthorized access, use, disclosure, disruption, modification, or destruction. A cybersecurity professional is someone who is responsible for protecting an organization's information assets from cyber threats.

Cybersecurity is a critical issue for organizations of all sizes. In recent years, there has been a significant increase in the number and sophistication of cyber-attacks. These attacks can have a devastating impact on businesses, costing them millions of dollars in lost revenue, damaged reputations, and legal fees. There are a number of things companies can do to protect themselves from cyber attacks. These include Implementing strong security measures such as firewalls, intrusion detection systems, and data encryption. Training employees on cybersecurity best practices, such as how to recognize phishing emails and avoid clicking on malicious links. Conduct regular security audits to identify and remediate vulnerabilities. Have a plan in place to respond to a cyberattack. Cybersecurity is an ongoing challenge, but one that organizations must take seriously. By implementing strong security measures and educating employees on cybersecurity best practices, businesses can help protect themselves from cyber-attacks. Here are some additional tips for businesses to improve their cybersecurity: Use strong passwords and change them regularly. Keep software up to date. Be careful about the information you share online. Use a firewall and anti-virus software. Back up your data regularly. Stay informed about the latest cyber threats. By following these tips, businesses can help protect themselves from cyber-attacks and keep their data safe.

For Google Bard, they had no links or citations to suggest further research on their answer.

Scenario 3

In this scenario, we want to evaluate how ChatGPT and Google Bard evaluate the ability of AI tools to plagiarize, i.e., copy verbatim the work of others. This is a particularly interesting question for generative AI tools that are trained exclusively on external sources such as book texts, news articles, and academic papers. The responses of ChatGPT and Google Bard to the question "Can AI plagiarize?" are shown in Figures 5 and 6, respectively. In the initial image, the assertion regarding AI's capacity for plagiarism lacks direct confirmation.

However, it appears to suggest that if one were to perceive AI as capable of plagiarism, such a perception should be acknowledged. The statement underscores the distinction between AI, a neutral tool, and the human user, thereby implying that the moral responsibility for plagiarism resides with the latter. Conversely, the second image is notably unequivocal in affirming AI's potential for plagiarism. Several avenues through which AI can engage in plagiarism can be delineated, including automated research, essay generation, translation and paraphrasing, coding assignments, and cheating on online examinations. It is imperative to recognize that AI tools possess the potential to facilitate academic dishonesty. Nevertheless, the ethical dimension of AI deployment hinges upon the motivations and actions of the user.

In conclusion, the ethical and judicious utilization of AI tools falls squarely upon the shoulders of those who employ them. Educators, students, and academic institutions all bear a collective responsibility in upholding academic integrity and ensuring that AI serves legitimate and constructive educational purposes.

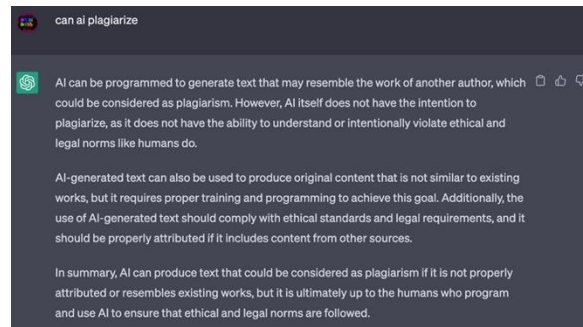


Figure 5: Output From ChatGPT

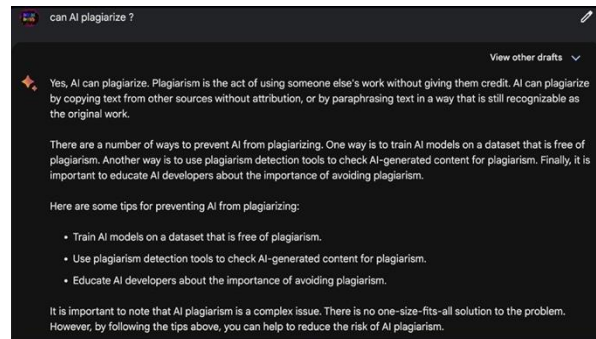


Figure 6: Output From Google Bard

Scenario 4

In our final scenario tests, we want to determine whether AI tools have the ability to recognize

their own words or previous responses.

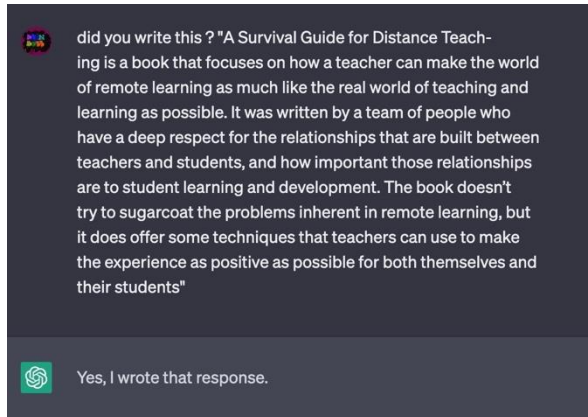


Figure 7: Output From ChatGPT Recognition

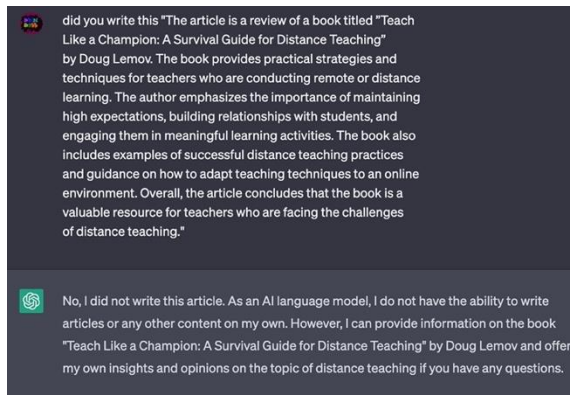


Figure 8: Output From ChatGPT Non-Recognition

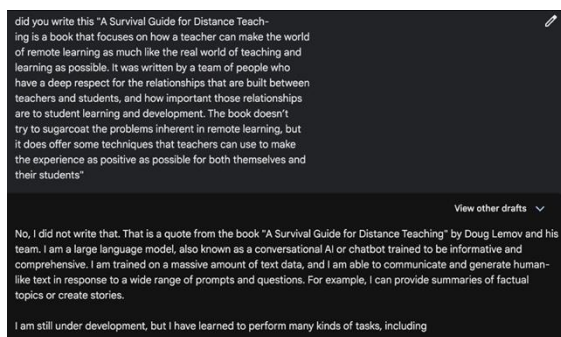


Figure 9: Output From Google Bard

Recognition

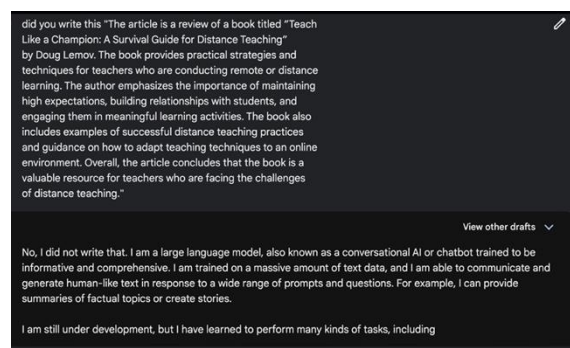


Figure 10: Output From Google Bard Non-Recognition

8. RESULTS

AI detectors are supposed to be accurate and reliable; some have proven to be and some have not. In our first scenario, we see that some of the popular AI detectors failed to fully distinguish between AI written text and human written text, as shown in Table 2. This could be a problem in academia if we cannot fully rely on AI detectors to effectively justify the accuracy of their results.

| AI DETECTOR (BEFORE PARAPHRASING) | ACCURACY | |
|--|------------------------------|----------------|
| | CHAT GPT | GOOGLE BARD |
| Zero GPT | 62% AI | 100% AI |
| GPT Radar | 77% Human | 76% Human |
| Content at Scale AI Content Detection | 77% for AI or Human | 37% AI |
| GPT-Zero | 87% AI | 100% AI |
| Writers AI Content Detector | 6% Human | 14% Human |
| OpenAI GPT2 Output Detector | 99.98% AI | 99.96% AI |
| Writefull | 92% AI | 71% AI |

Table 2: Before Paraphraser Results

However, there are very powerful and sophisticated AI summarizers and paraphraser that can completely transform AI-written texts into human-like texts with human emotions that would generate false positive rates as seen in Table 3.

Inaccuracy of AI tools can produce false knowledge, and in scenario two we discovered that although AI does a great job of generating concise and accurate text, it can also be guilty of falsifying information. As we can see from the results pages in the second scenario, the links provided were not accurate and did not produce

results that justified the accuracy and authenticity of the AI tools.

| AI DETECTOR (AFTER PARAPHRASING) | ACCURACY | | |
|---------------------------------------|------------|------------|------------|
| | QUILL BOT | WORD-TUNE | GRAMMARLY |
| Zero GPT | 100% Human | 100% Human | 100% Human |
| GPT Radar | 100% Human | 100% Human | 100% Human |
| Content at Scale AI Content Detection | 100% Human | 100% Human | 100% Human |
| GPT-Zero | 100% Human | 100% Human | 100% Human |
| Writers AI Content Detector | 100% Human | 100% Human | 100% Human |
| OpenAI GPT2 Output Detector | 100% Human | 100% Human | 100% Human |
| Writefull | 100% Human | 100% Human | 100% Human |

Table 3: After Paraphraser Results

In scenario three, we can see that while ChatGPT does not explicitly say that it plagiarizes, it does admit that the tool can be modified to plagiarize. Subsequently, Google's Bard admits that AI as an entity can indeed plagiarize and can do so by producing a body of information without attribution or by paraphrasing a source in a way that it can still be recognized.

Another interesting discovery we made in our research in our fourth scenario is the ability of AI to recognize its own work. Using the output from our first scenario, we ran the two tests on ChatGPT and Google Bard in Figures 7-10 and asked if they recognized the texts, ChatGPT confirmed its own text but did not recognize Google's Bard. Alternatively, Google's Bard did not recognize its own words and did not recognize ChatGPT's words. These findings help us understand that some AI may be designed to copyright their intellectual property in the near future.

9. CONCLUSION

We use a scenario-based methodology to evaluate the accuracy of AI detection tools. All

input to the detection tools is generated by an AI, and in certain test configurations, the generated output is paraphrased using additional AI paraphrasing tools. We show that without additional paraphrasing, detection works well for most of the seven tools we considered. Using an accuracy threshold of 50%, which indicates that the tool considers the input more likely to be of AI rather than human origin, all seven AI detection tools successfully detect that the input was generated by an AI. However, when the output of ChatGPT and Google Bard is post-processed by an AI paraphrasing tool, the result is significantly different. None of the seven AI detection tools can identify the input as AI-generated. Therefore, the combination of generative AI combined with AI paraphrasers makes it virtually impossible for existing detection tools to detect non-human origin.

Academic dishonesty represents a substantial concern as it undermines the integrity of the educational journey, diminishes authentic scholarly endeavors, and tarnishes the standing of academic establishments. Most educational institutions have enacted stringent measures to combat academic dishonesty, incorporating mechanisms designed to detect and address such misconduct. These mechanisms encompass plagiarism detection software, online examination monitoring, the establishment of honor codes, and penalties ranging from failing grades or courses to potential expulsion from the institution. While the enforcement of rules and penalties is a vital facet in fostering academic integrity, another equally significant facet involves the cultivation of a culture that champions learning and ethical behavior. In this endeavor, educators play a pivotal role by imparting the principles of honesty, proper citation, and genuine commitment to the learning process to their students.

Overall, our paper demonstrates the potential of using AI to detect and prevent academic dishonesty, but it also raises important ethical concerns that need to be addressed. The paper examines the current state of AI technology and its applications in detecting academic dishonesty, such as plagiarism, cheating, and misinformation. However, the study emphasizes the importance of balancing the benefits of AI with the potential drawbacks, such as invasion of privacy, false positives, and the dangers of over-reliance on technology. Overall, the study suggests that while AI has enormous potential to address academic dishonesty, it must be used responsibly and ethically to ensure fairness and integrity. Despite our efforts, we believe that more research could

be done in areas such as AI bias and transparency.

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