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Academic Integrity in a Digital Era: Should the Use of ChatGPT Be Banned in Schools?

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ABSTRACT

Purpose: This paper is to examine the ethical implications of the use of ChatGPT in academia.

Design/methodology/approach: This study reviews the previous research and cases associated with using a generative AI, such as ChatGPT, to effectively use ChatGPT in education for teachers and students by examining the negative (especially ethical issues) and positive aspects of ChatGPT.

Findings: The findings of this research are that the usage of ChatGPT in schools has both negative and positive aspects. The results of this study indicated that effectively incorporating ChatGPT into educational settings: 1) identify opportunities to integrate ChatGPT into the curriculum; 2) define the specific goals and objectives to be achieved using ChatGPT in classes; 3) establish clear guidelines and boundaries for using ChatGPT; and 4) emphasize the importance of critical thinking and independent problem-solving skills with ChatGPT.

Research limitations/implications: Considering the lack of previous research on ChatGPT, the limitations of this study lie in the fact that it is not based on empirical research with actual data.

Originality/value: This study suggests potential opportunities and challenges for educational institutions, students, policymakers, and users regarding the using ChatGPT.

Keywords: ChatGPT, ChatGPT Ban, ChatGPT in Education, Academic Integrity

I. Introduction

Artificial intelligence (AI) has seen significant development in recent years that has had a tremendous impact across industries (Baek, 2021; Chin et al., 2023). Although AI rapidly transforms the world, its rise comes with profound implications (Farrokhnia et al., 2023). A generative AI, such as ChatGPT, became a hot issue after its release in November

2022 due to its ethical issues, such as personal information and plagiarism. In the education industry, AI-based technologies have rapidly spread, and recently, the release of ChatGPT by OpenAI has caused a tremendous sensation in the academic community. Academic integrity is a core component of education, as it promotes a culture that values learning, knowledge creation, honesty, and ethical conduct. In addition, academic integrity creates room for fairness in academic activities while ensuring that students gain essential skills in communication, critical thinking, research, and writing. However, the increasing popularity of AI-powered tools like

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ChatGPT, especially in academia, has raised concerns from stakeholders who worry that the increased usage of these tools threatens the value placed on academic integrity in institutions (Roose, 2022).

Although previous studies suggested the need for generative AI in the educational system (e.g., Brusilovsky, 2023; Cotton et al., 2023; Dehouche, 2021; Li and Xing, 2021; Zawacki-Richter et al., 201), some schools have prohibited using generative AI, including ChatGPT, due to concerns that it could negatively impact students' thinking abilities and problem-solving skills.

Some schools have prohibited using generative AI, including ChatGPT, due to concerns that it could negatively impact students' thinking abilities and problem-solving skills. For example, many top universities across the United Kingdom, including Oxford, Cambridge, and Manchester, have banned ChatGPT for assessments (DESIblitz.com, 2023). New York City Public Schools, the nation's largest school district in the United States, moved to ban its use by students. Los Angeles Unified, the second largest school district, blocked access from the school network to the websites of OpenAI. In addition, universities and their professors are concerned about how to deal with artificial intelligence in classroom (Mhlanga, 2023). Nevertheless, as our daily lives and industries undergo digital transformations, especially with the Millennials (born in 1981 - 1995) and Generation Z (born in 1996 - 2005) being highly familiar with digital devices, it is important to consider the societal trend of this digital era (Bakria et al., 2023). In light of these contextual changes, it is a timely moment to discuss whether we should automatically oppose ChatGPT solely based on its negative aspects in the education community.

Students' use of ChatGPT, an AI-powered tool, may affect their ability to acquire crucial skills. For instance, relying too much on ChatGPT may limit opportunities for innovation and independent thought in academic activities, diminishing the educational value of the experience. Additionally, there is a chance that students may copy, paste, or paraphrase contents ChatGPT generated without giving valid credit, which

is a violation of academic integrity. Plagiarism has significant ethical, legal, and educational consequences in academic settings. For example, it degrades both the standard of instruction and the fairness of assessments. The problem is that even teachers do not know if the document created was generated by ChatGPT at this time. While ChatGPT cannot be used to detect AI-generated writing, a rush of technology companies, including ChatZero developed by Stanford University, is selling software they claim can analyze essays to detect such text. However, AI-generated writing is almost impossible to identify. An instructor at Texas University gave a zero on a student assignment because the instructor believed ChatGPT generated the assignment, but it was not true. Finally, the student received a grade and graduated (Verma, 2023).

Additionally, plagiarism undermines the integrity of academic work and harms the reputation of educational institutions. Therefore, it is necessary to inform students about the precautions associated with the use of ChatGPT and provide effective approaches for its utilization. The millennial generation is widely recognized as highly familiar with the digital landscape, including elements such as social media platforms and youtube. Consequently, the use of ChatGPT, which has gained prominence in education, may be seen as a natural progression in line with the characteristics of this generation (Agrawal, 2023).

Therefore, in a digital age where knowledge, tools, and resources like ChatGPT are easily accessible online, upholding academic integrity is increasingly important. For academic work to be credible, genuine, and reliable, upholding academic integrity as a critical value is essential. Academic integrity is also a defense against the potential dangers and difficulties brought about by the use of AI-powered educational systems; therefore, this paper will explore the ethical impact of ChatGPT in schools, including the potential impact on academic integrity and plagiarism prevention, and propose strategies for responsible use in the era of artificial intelligence.

The rest of the paper is organized as follows: The following section introduces the ethical implications

of ChatGPT in an educational setting and presents academic integrity in academia. Section 3 discusses opportunities and challenges of using ChatGPT in Schools. Finally, Section 4 presents conclusions, contributions, and limitations.

II. Background and Related Work

A. Ethical Implications of ChatGPT in Schools

The introduction of ChatGPT to the general public occurred less than a year ago, and consequently, there is a lack of prior research related to ChatGPT. Therefore, this section discusses the ethical issues arising from using ChatGPT in educational settings, such as instances of plagiarism and a lack of original thought, as well as the impact of ChatGPT on students' abilities to learn and advance. The study.com survey (2023) shows that among 1000 subjects (students and teachers), over 90% of students are aware of ChatGPT, and over 89% have used it for homework assignments (at-home tests, quizzes, or essay writing). Surprisingly 72% of college students believe that ChatGPT should be banned from their college's network.

OpenAI, an organization leading in artificial intelligence research, created an AI language model called ChatGPT. ChatGPT is a deep-learning language model that generates human-like responses to user prompts. ChatGPT is trained on a large amount of data from a wide variety of sources on the Internet (Kasneci et al., 2023; Patel, 2023). The training ChatGPT receives allows it to learn the patterns of human language, allowing it to structure its responses in a similar way. As a result of the data it is trained from, ChatGPT is popular for being queried on topics across diverse fields, including technology, education, and healthcare (McCallum, 2023). However, according to Kasneci et al. (2023), it is not always accurate, as some of the responses it may produce reflect some of the biases present in the data on which it is trained.

Students increasingly use artificial intelligence (AI) in the classroom, and ChatGPT seems to be

one of the most popular tools. Students benefit from ChatGPT in writing essays with assignments, creating programming code, or building their resumes (Cotton et al., 2023; Li and Xing, 2021; Zawacki-Richter et al., 2019). However, according to Cotton et al. (2023), there were reports of academic dishonesty a few months after ChatGPT-3 was released in late 2022. ChatGPT's release and its ability to be applied to various industries raise a variety of ethical challenges (Dehouche, 2021). Recently, Italy, the first Western county, banned ChatGPT for seemingly no legal basis underpinning the massive collection and processing of personal data to train the algorithms. In line with Italy, the United Kingdom and the European Union (EU) plan to regulate the use of ChatGPT by applying existing regulations in different sectors to AI rather than establishing new regulations (Browne, 2023; Lee, 2022; Martindale, 2023).

According to the Oxford Dictionary, plagiarism is the "practice of taking someone else's work or ideas and passing them off as one's own". Plagiarism is widely considered unethical and a violation of the academic honesty that various institutions uphold. To show the gravity of this offense, students who are caught plagiarizing face some form of academic punishment from their institution. The consequences of academic dishonesty should naturally deter students from plagiarizing and cheating. However, the release of powerful artificial intelligence tools like ChatGPT, whose responses make it practically impossible to distinguish between human-generated content (Kasneci et al., 2023), has provided a means for students to be academically dishonest. Aside from the fact that students can copy and submit ChatGPT-generated content easily without providing proper citations to original credit authorship, they may also be submitting inaccurate work with incorrect references or biases. In a research paper by Cotton et al. (2023), they used ChatGPT to generate content for their paper by giving it prompts for various sections. According to Cotton et al. (2023), "Finally, the authors removed the references inserted by ChatGPT (all of which were plausible but entirely fictional) and inserted genuine references where necessary." The authors

note that even though ChatGPT provides human-like responses, it gives fake and irrelevant citations that may otherwise have appeared. In other studies, it has been shown that since ChatGPT is trained on a wide variety of information, it can sometimes reflect the bias and prejudice that exist in it (DESIBlitz.com, 2023). Therefore, the potential for plagiarism, academic dishonesty, and the propagation of biased content concerns academia.

In addition, the potential for lack of originality and creativity in the assignments, projects, or tests that students submit raises another ethical concern about ChatGPT use by students in academia (Dehouche, 2021). ChatGPT only repurposes existing data that it is trained on; this means that it is limited in terms of the originality of its content. Students who use ChatGPT to generate content for schoolwork may be hindering their ability to think critically and creatively. It means that the values placed on originality, critical thinking, and invention by academia are at risk of being lost. According to Cotton et al. (2023), authentic learning experiences are important for students to grow in order to develop their cognitive, social, and emotional skills, and using ChatGPT to generate content may hinder this development. Since learning requires effort, motivation, and a willingness to be challenged, but ChatGPT requires minimal effort to generate content, a reliance on ChatGPT may demotivate students from wanting to learn since they could easily outsource their work to the AI model.

In summary, based on the observations thus far, the primary concerns associated with the use of ChatGPT in schools revolve around ethical issues and a potential decline in students' critical thinking skills. Conversely, there have been indications of positive effects resulting from students' use of ChatGPT. Therefore, implementing regulations, rules, and educational systems for ChatGPT in schools can help alleviate some of these concerns.

B. Academic Integrity in the Age of ChatGPT

According to The University of North Carolina

Writing Center (2019), "Academic integrity is the commitment to and demonstration of honest and moral behavior in an academic setting." In the previous section, we discussed plagiarism and academic dishonesty as ethical implications of ChatGPT use in academia. In this section, we shall discuss more about the importance of academic integrity and how to maintain it in the digital age. Academic integrity is critical in education because it allows students to develop their cognitive skills while pursuing knowledge with integrity to be meaningful contributors to the creation of new knowledge.

In the United States, individual creators have filed a class-action lawsuit against image-generating AI services providers, such as DALL-E and StyleGAN, for training their algorithms in their copyrighted works, thereby violating the copyright law, in another instance, at an art exhibition organized by the State Fair of Colorado, a digital art competition, a piece titled 'Space Opera Theater' created by a game designer named Jason M. Allen using AI technology claimed the top prize, sparking controversy. Some netizens expressed anger arguing that artworks created by AI cannot be considered art and that it is unjust for a piece that did not involve any human brushstrokes to win (Roose, 2022). The regulations governing the digital art category in the exhibition allow for digital manipulation, including using digital techniques or adjusting colors. Furthermore, there have been cases where the US Copyright Office recognized the copyright of comics created by AI, such as those produced by DALL-E. This suggests that AI-generated works have been acknowledged as having creativity and originality, thereby being granted copyright protection.

Aside from honesty and trust, one fundamental principle of academic honesty is fairness (International Center for Academic Integrity, 2021). Fairness allows students to be evaluated based on merit without bias or discrimination. Fairness also creates a level playing field for all students, regardless of their background. Therefore, the use of ChatGPT in academia threatens the fundamental principles of academic honesty (Farrokhnia et al., 2023). The use of this AI tool may not just hinder students' personal growth, but

it can also be unfair to other students who are working hard and following the rules. For example, some students may have access to advanced AI tools that allow them to cheat, which may allow them to get better grades than students who demonstrate original thinking (Kasneci et al., 2023). Students using AI might get higher marks than students who want to learn and do the writing themselves. This is a threat to fairness, which is a core value in academia. Therefore, the academic community should contemplate whether to prohibit the use of advanced information and communication technologies, thereby eliminating various opportunities or to provide diverse opportunities while ensuring fair evaluation of the methods employed, thus offering students a sense of academic fairness.

In digital age, where access to tools is abundant, academic integrity becomes more important. Academic integrity ensures that students produce work that is credible, valid, and reliable (Kooli, 2023), which is very important in a competitive job market that places much value on critical and original thinking and ethical conduct in candidates. This means that institutions must adapt to the advancement of disruptive AI tools to continue to produce graduates who can survive a competitive job market (Gao, 2021; Dehouche, 2021; Zawacki-Richter et al., 2019). By providing guidance and support on ethical conduct to guide the use of these new and disruptive AI tools by teachers and students, institutions may help uphold academic integrity.

III. Cases of Using ChatGPT in School

An experiment was conducted by a professor (Frako Loden) at Diablo Valley College, CA. In spring 2023, she created an assignment to see how students in her American Cinema class interacted with ChatGPT. The assignment was that students would choose a discussion topic about the 1950s movie "A Place in the Sun," type it into ChatGPT as a prompt, then grade the responses generated by ChatGPT. One of

the students said that ChatGPT sometimes generated the wrong plot. In the film, for example, protagonist Goerge takes his girlfriend to a lake, and she accidentally falls in and drowns. However, ChatGPT says he purposely pushes her into the lake and kills her. A person who watched the movies and another person who just read the script ChatGPT generated have a totally different point of view on the actor, George. The former feel Goerge is innocent, while the latter feels he is evil (CalMatters, 2023). The student's assignment demonstrates the limitations of ChatGPT, including bias, because ChatGPT collects data from all resources existing over the Internet and is trained on the data bias.

In accordance with the article published by Calmatter in 2023, Professor David Grusky, a sociologist at Stanford University, developed a curriculum for a recent public policy course that permitted the utilization of AI-generated material in assignments, provided that appropriate citation practices were followed, akin to referencing a conversation with a person. He said, "it's a conversation that can be evoked at will. But it's not different in the content. You still have to evaluate what someone says and whether or not it is sensible." He suggested that ChatGPT possesses substantial promise as an instructional tool for students, serving as a writing consultant. Moreover, he articulated the belief that artificial intelligence (AI) possesses the potential to aid students in enhancing their skills in evaluating the reliability and quality of sources, hence offering significant advantages to the academic community in the foreseeable future. In response to the urging of faculty members, Stanford University has implemented a foundational regulation that prohibits the utilization of artificial intelligence (AI) for the purpose of facilitating the completion of academic assignments, unless explicitly permitted in the corresponding course syllabus.

IV. Opportunities and Challenges of Using ChatGPT

A. Educational Policies and Guidelines for ChatGPT in Schools

In this section, this study aims to propose guidelines for adhering to ethical conduct and academic integrity regarding the use of ChatGPT in schools based on the discussions that have taken place earlier. We also seek to address the requirements necessary for effectively utilizing ChatGPT in educational settings.

Digital technology is an integral part of our lives, and its advancement has seen the revolution of many industries (Chin et al., 2023; Darmanto et al., 2022). The role of technology in the advancement of education alone is evident. For example, language model tools that enhance distant learning, help in lesson planning, provide options for people with disabilities, assist in evaluation and assessments, and provide online tutoring have made learning easier, more accessible, and sometimes more enjoyable (Kasneci et al., 2023). Therefore, the use of ChatGPT can be regulated and controlled to reflect positive outcomes in academia. For example, Abdelghani et al. (2023) conducted research that "evaluated the use of large language models to generate pedagogical content for training divergent QA skills" in children. They had great results showing the efficiency and benefits of using language models to improve children's curiosity. Although there are no clear national policies that control the use of AI tools like ChatGPT in schools, many institutions have guidelines to address academic integrity and plagiarism that can be applied to the use of ChatGPT.

B. Opportunities and Challenges of using ChatGPT in Schools

Institutions with clear rules guiding academic integrity prohibit students from plagiarizing, cheating, or accessing unauthorized resources to complete academic work. These policies usually define academic

dishonesty, the measures taken to prevent it, the consequences of partaking in it, and ways to avoid it through proper citations. For example, some institutions use plagiarism detection tools like Turnitin; others have begun to use AI detection tools as well (Cotton et al., 2023); others have writing centers to assist students with proper citations and academic work; and a majority have clear punishments for students caught submitting dishonest work. According to Agrawal (2023), an organization will likely adopt generative AI, including ChatGPT, based on three contexts: organization (e.g., technological resources, absorptive capability), technology (e.g., relative advantage), and environment (e.g., regulatory support). Considering the fierce competition between universities to recruit and retain students, schools will benefit from adopting ChatGPT. This study suggests the following steps that help use ChatGPT effectively in schools.

First, rather than banning using ChatGPT, a similar approach can be an excellent way to guide the use of ChatGPT in institutions. Students can be educated on ChatGPT, how it operates, the limitations of its use, and the consequences of its unethical use. Institutions can teach students ethical ways in which this tool can be used. By creating a culture of transparency and education, students will be able to understand better how to utilize ChatGPT ethically while maintaining academic integrity. In other words, establish clear guidelines and boundaries for using ChatGPT. For example, define the types of questions or topics that are appropriate and ethical and specify any limitations or restrictions to ensure responsible and safe use.

Second, in addition to education, syllabuses should be adapted to reflect evolving technologies and their capabilities. It is no surprise that, despite its threat to academic integrity, ChatGPT has proven to be beneficial in aiding students' learning. Because ChatGPT's response can be tailored to meet individual needs, it can be a good tool for learning. However, it cannot replace the traditional relationships between teachers and students. It does not provide students with the practical, experiential, hands-on learning experience that real-world classrooms do (Roose,

2022). Identify opportunities to integrate ChatGPT into the curriculum. For example, it can be used in programming classes for writing codes for a given problem or in science classes to provide additional explanations. In addition, define the specific goals and objectives you want to achieve using ChatGPT in classes (Roose, 2022). Identify areas where the model can provide valuable assistance, such as answering questions, providing explanations, or engaging in creative writing activities in syllabuses. Faculty can integrate ChatGPT into their course materials by creating interactive web applications allowing students to interact directly with the model.

Third, it is essential that learning be changed to take advantage of ChatGPT's benefits while creating new and innovative ways to test students' originality of thinking. For example, students can be given clear instructions on how to use ChatGPT as an additional resource for learning, but tests, exams, and assignments should have questions that challenge students to think critically and practically while emphasizing a process-based approach as opposed to the traditional result-based approach that institutions use. Encourage students to verify information, challenge assumptions, and think critically about the responses they receive. ChatGPT can be used in the classroom for facilitating group discussions and debates. Faculty will use generative AI technology to generate questions or problems and prompts related to discussion topic into ChatGPT.

Lastly, regularly evaluate the effectiveness of ChatGPT implementation in schools. Gather feedback from students and teachers, assess its impact on learning outcomes, and make necessary adjustments based on the results (Gao, 2021; Li and Xing, 2021; Zawacki-Richter et al., 2019). This will ensure that ChatGPT responses are not all-important to students, resulting in a more challenging and rewarding learning process. Therefore, using ChatGPT in schools can provide several benefits, such as assisting students with their queries, enhancing the learning experience, and promoting creativity.

As discussed above, while there are negative impacts associated with the use of ChatGPT in

schools, there are also positive aspects. Therefore, it is crucial to integrate both sides effectively and propose strategies or establish necessary regulations to ensure efficient utilization. Industries and our lives are already undergoing significant digital transformations (Darmanto et al., 2022). If we adhere only to traditional academic learning methods, engaging students who need to accumulate knowledge becomes challenging. Therefore, to foster student engagement and prepare them for the same fields they will enter, we should focus on applying and enhancing the utility of generative AI in education while maintaining users' conscience, academic integrity, and fairness. This approach will help cultivate talents in line with the ethical and academic principles of the field.

V. Conclusion and Discussion

Artificial intelligence is rapidly advancing and is on its way to transforming our world (Chin et al., 2023). ChatGPT is an advanced AI language model that has been identified as a potential threat to academic integrity in schools. Knowing this, we must examine the ethical implications of AI tools like ChatGPT in education. However, there is a paucity of research addressing AI tools, as ChatGPT was launched in late 2022. One significant implication is ChatGPT's threat to academic integrity. Academic integrity ensures that students are challenged to learn the skills and knowledge to become scholars who can think critically and creatively without taking credit for someone else's work. Unfortunately, numerous reports have shown students using AI tools like ChatGPT to complete their schoolwork without giving proper credit because ChatGPT can respond to prompts with human-like responses (Study.com, 2023; Dehouche, 2021). OpenAI's technology is leading to fears of cheating on homework, but its potential as an educational tool outweighs its potential risks (Rampton, 2022). As ChatGPT can respond to customer inquiries faster, improving customer satisfaction, this

technology may allow users to ask or review follow-up questions to complex search queries (Mearian, 2023).

This study investigated the ethical implications of the academic integrity of ChatGPT and discussed whether ChatGPT should be prohibited to preserve academic integrity. Based on the discussion of previous research and case studies, this research examined both the threats (negative aspects) and opportunities (positive aspects) associated with the use of ChatGPT. Prohibiting the use of generative AI due to ethical, authenticity, and fairness concerns in the digital age is evaluated as going against the current demands and moving in the opposite direction. Therefore, this study shows that education and other industries can benefit from ChatGPT in various applications with a well-established and balanced regulation policy in cooperation with OpenAI, the government, and interested parties.

This study provides several contributions in terms of academic and practical aspects. First, from an academic standpoint, the opportunities and threats presented in this study, given the lack of existing academic research on the use of ChatGPT, can serve as foundational material for the scholarly evaluation of ChatGPT usage. Second, the opportunities and threats can also be utilized as evaluative factors in comparative studies on ChatGPT usage among students. Third, they can be employed in comparative studies between groups that use ChatGPT and those that do not, to derive operational strategies based on performance outcomes. Fourth, Although this paper examines the effects of ChatGPT in educational settings, future research can extend to other industries, such as business, marketing, or healthcare. For example, ChatGPT can automate iterative tasks and improve customer engagement with its natural language processing capability in business. Lastly, in the academic and educational fields, the proposal of educational curricula and programs aimed at enhancing the efficient use of ChatGPT while addressing ethical, authenticity, and fairness issues can also be utilized as foundational scholarly research.

From a practical perspective, the following suggestions can be considered as basic resources that

can be used in the field. First, it is equally important to remember that ChatGPT is a tool that can be used both negatively and positively, depending on the intent of its use. Several researchers have shown the opportunities that ChatGPT holds, especially in education. For example, its ability to create personalized assessments for students, facilitate research and group activities, and break down complex problems, all of which help stimulate critical thinking and problem-solving, making learning more effective for students. Therefore, further research and discussions are required on incorporating ChatGPT into school curricula and mitigating the existing and potential negative consequences of ChatGPT use in academia.

Second, educational institutions should accept that ChatGPT and other AI tools are here to stay because artificial intelligence and its capabilities are constantly growing and evolving, while they may be tempted to ban their use. Rather than keeping track of the multitude of tools being created in an attempt to ban them, an alternative and perhaps more feasible approach would be to control the use of AI tools like ChatGPT by defining ethical ways in which they can be used positively in academia (Dehouche, 2021). For example, when an instructor can give assignments, such as an essay, research writing, or problem-solving, he can give step-by-step, one-by-one instructions for the assignment, not a whole assignment with references included in each step which ChatGPT is incapable of. With this approach, ChatGPT and other AI tools can be catalysts for revolutionizing education for good.

Third, using AI in decision-making processes also brings up legal and legislative problems. There may be concerns about who is in charge of decisions made by AI algorithms and if businesses can be held accountable for any damage they create. Aspects of regulation and whether AI algorithms should be held to the same standards as human decision-making may also be questioned. Applying AI to decision-making procedures may profoundly affect society and the economy. For instance, if some groups are routinely excluded from certain businesses, AI algorithms in hiring decisions may result in employment losses or increase inequality. Similarly, AI algorithms

employed in insurance or finance may result in unequal treatment of people or groups depending on characteristics like race or gender.

Lastly, OpenAI, the government, and interested parties must collaborate to establish new regulations for ChatGPT rather than applying existing regulations that may not apply to AI to address ethical issues. Sam Altman, CEO of OpenAI, was summoned to a hearing on the US Congress in May 2023 and said, "if this technology goes wrong, it can go quite wrong, and we want to be vocal about that. We want to work with the government to prevent that from happening (Fung, 2023)".

This study has several limitations. Although the positive and negative factors of ChatGPT usage in schools were discussed, considering the lack of prior research on ChatGPT, the study's limitations lie in the fact that it is not based on empirical research with actual data or mathematical methods to support the arguments in this paper. Therefore, future studies of an empirical study or a mathematical method will contribute to the generative AI research area. While ChatGPT is being widely applied in industries, there is a higher level of resistance to its use in the academic and educational fields, which limits the generalizability of the study findings. Furthermore, since the opportunities and threats were proposed based on previous research and case studies without actual academic consequences resulting from ChatGPT usage, future empirical investigations, and comparative studies are needed to validate these findings.

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Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

All authors have conceptualization, writing, and read of the manuscript. Material preparation and original draft, Divine Ogugua; case collection and analysis, Seong No Yoon; Conceptualization, DonHee Lee. All authors have read and agreed to the published version of the manuscript.

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