



Smart Chat, Bright Minds: Does Chat GPT Propel Students to Academic Heights?

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ABSTRACT

ChatGPT is an AI-powered chatbot being utilized more frequently in the field of education to promote academic achievement and cognitive development. This research paper explored ChatGPT's function in educational environments and how it may help students reach new academic benchmarks among senior high school students. The study employed descriptive-survey research design. The respondents were 89 Grade 12 students from STEM, GAS, and CSS strand. The data were tabulated and analyzed using descriptive statistics, Kruskal-Wallis H test and post-hoc-test, the Dunn-Bonferroni-Tests. The results revealed ChatGPT increased student engagement, efficiency, autonomy, and difference between the three groups, but there is a challenge about academic integrity. Therefore, teachers should provide sessions to promote responsible usage, and ensure continuous monitoring and ethical use of AI-generated material. The researchers plan to host seminars on educational benefits and minimize disadvantages, resulting in improved academic achievement. Further study involving equal grouping and larger samples in a longer period is also recommended to further establish the result.

Keywords: *academic performance, artificial intelligence, ChatGPT, efficiency, engagement*

Technology integration in the classroom is not a new idea (DO No. 78, s. 2010). However, the use of technology (hardware and educational applications) was maximized during the Covid-19 pandemic (DO No 28, s. 2021). And within the quickly changing era of education, Artificial intelligence (AI) like Chat GPT, an

INTRODUCTION

advanced language model created by OpenAI (Fuchs, 2023) to produce text responses that are both intelligible and contextually appropriate in a conversational style has drawn notice. Just as the invention of computers and televisions was previously heralded as a revolution in education, so too have these technologies been



demonstrated to improve information availability. It can generate text that resembles that of a human, respond to queries, and participate in conversations (Hetler, 2023). Additionally, ChatGPT provides education and training, handles routine tasks, reduces expenses, enhances content quality, ensures digital accessibility, provides multilingual support, customizes responses, manages multiple users concurrently, comprehends natural language, and delivers immediate responses.

In education, ChatGPT can assist students who require additional help in specific subjects for personalized learning, automate repetitive tasks, and provide 24/7 access to educational resources (Kirk, 2023; Mormando, 2023). It suggests that this technology can fill gaps in knowledge and support struggling learners, with a particular emphasis on cognitive growth, critical thinking, problem-solving (DepEd Order No. 21, s. 2019), collaboration and engagement (Li & Xing, 2021). Academic engagement is a complex concept that significantly influences the learning experiences and outcomes of students. Positive academic behaviors like motivation, increased achievement, and decreased attrition rates are all associated with it (Alrashidi et al., 2016; Alonso-Tapia et al., 2022; Trolan, 2023).

Multiple theories including Constructivist Learning Theory, Cognitive Load Theory, Technology Acceptance Model (TAM), Self-Determination Theory (SDT), and Connectivism (Glaser, 2023; Kim & Adlof, 2023), can be utilized to integrate ChatGPT into education. The Constructivist Learning Theory posits that knowledge is constructed by learners through their experiences which can be provided by ChatGPT through personalized learning,

meaningful conversations, and construction of knowledge through interaction whereas Cognitive Load Theory aims to maximize the capacity of working memory. ChatGPT can assist with cognitive burden management by delivering information in digestible segments and providing prompt feedback. Intention to use technology is predicted by perceived utility and ease of use, according to the TAM. In contrast to SDT, which emphasizes competence and autonomy by allowing learners to control their learning pace, Connectivism highlights the role of technology in establishing and maintaining networks between learners and information. Integrating these theories would emphasize active learning, cognitive burden management, technology acceptance, self-determination, and connectivism. It would provide guidance and direction on how to utilize ChatGPT to establish a connected, interactive, and personalized learning environment that increases student engagement and learning.

However, Guilherme (2019) and Hetler (2023) stated that ChatGPT in the classroom can also result in negative outcomes such as susceptibility to misuse, lack of personalization, exposure to false information - inaccurate and out-of-date information, social isolation, loss of human connection, ethical dilemmas, distraction, technical inequality, and limited emotional support. Additionally, it is incapable of accommodating different learning styles, and an excessive dependence on AI may result in a decline in critical thinking and problem-solving capabilities. Furthermore, when a student uses a chatbot application to get answers to their questions, it could be challenging for academic staff to evaluate the student's comprehension of the topic. This is due to the

possibility that the chatbot application's responses do not fairly represent the students' actual comprehension levels (Cotton, 2023). On the other hand, Lo (2023) evaluated ChatGPT's functionality across various subjects and educational implementations. The author found that the platform performed inconsistently, with outstanding performance in economics but inadequate in mathematics. Moreover, despite its potential as an online tutor, concerns about fabricated content and plagiarism detection systems remain. Hence, educators must approach integrating AI-driven chatbots with sincerity and contemplate its advantages and disadvantages. School districts also implemented network restrictions on personalized learning tools due to ethical concerns and limitations associated with their implementation in education (Glaser, 2023).

From the above arguments, the objective of this research paper is to analyze the multifaceted impact (pros and cons) of ChatGPT among Senior High School students in one public high school, investigating whether it functions as a catalyst for scholarly advancement or is it simply a trendy digital tool. Through an analysis of ChatGPT's capacity to facilitate engagement, improve critical thinking, and individualize learning, our objective is to ascertain its genuine educational worth and its potential to reshape the parameters of academic achievement. The study's wider implications for educational methods and the usage of AI technologies were explored, and recommendations for the integration of Chat GPT in educational contexts were made considering the findings.

STATEMENT OF THE PROBLEM

The study delved into the impact

of Chat GPT on students' academic learning. This study specifically sought to answer the following:

1. How often do students use Chat GPT for their academic tasks and has it affected their engagement or interest in their studies?
2. Have students reported any changes in the time it takes to complete assignments or understand new concepts since using Chat GPT?
3. Has the use of Chat GPT helped students become more independent in their learning process and decreased their dependence on other resources like textbooks and tutoring?
4. Is there a significant difference among the three learning groups' overall learning experience when using Chat GPT?
5. What activities can be recommended to help improve students' learning through the correct use of ChatGPT?

METHODOLOGY

The study employed a descriptive-survey research design to describe the effect of Chat GPT on the students' engagement, efficiency, autonomy, and overall learning experience.

Respondents

Grade 12 students in one public senior high school were the respondents of the study. These students from Science, Technology Engineering and Mathematics (STEM), General Academic Stand (GAS) and Computer Systems Servicing (CSS) are using ChatGPT (Sidoti & Gottfried, 2023) because they are engaged in rigorous courses, practical learning, group assignments, and apprenticeships to develop soft skills, prepare for careers, participate in

research, and utilize technology for lifelong learning (Andrada & David, 2020; Wahono et al., 2020; Han et al., 2021; Ai, 2023).

To obtain a wide representation and a thorough knowledge of Chat GPT's influence on academic achievement, the researchers surveyed all grade 12 students from the three strata with enrollment: STEM-15, GAS-62, CSS-12. To get a meaningful result, the minimum sample must be 100, however, since there are only 89 grade 12 students, all of them were surveyed (Bullen & Bullen, 2022).

Instrument

The researchers used adapted survey questionnaire from numerous studies (Intelligent.com survey; Winn, 2023; Lo, 2023) to assess the effects of Chat GPT on various domains, including academic engagement, efficiency, autonomy, and overall learning experiences.

To guarantee content validity, the questionnaire was submitted for content evaluation to the ICT teacher, Language teacher, and Values Education teacher using a validation tool (Oducado, 2020). The instrument has a Very High validity value of 4.67.

For the reliability test, the questionnaire underwent Pilot testing to Grade 11 (STEM-19), (GAS-17), (CSS-18) students who are using ChatGPT but are not included in the final sampling. The KR-21 formula was used because there is no right or wrong answer (Glen, 2017). The computed reliability coefficient of 0.65 indicates a high reliability. This implies that the tool is internally consistent, dependable, and stable.

Data Collection Procedure

The survey questionnaire was distributed and retrieved from the

selected Grade 12 students to gather data on the usage of Chat GPT, their engagement, time spent on assignments, independence in learning, and overall learning experience (Lo, 2023).

Data Analysis

The data gathered were tabulated and analyzed using descriptive statistics, such as mean, frequency, and percentage to gain insights into the effect of Chat GPT on students' level of academic engagement, academic efficiency, and learner autonomy.

On the overall learning experience, the non-parametric Kruskal-Wallis H test was employed to compare the means of the three independent groups, ordinal in nature, and of small or unequal sample size. It evaluates disparities in student learning experiences that are statistically significant among the STEM, CSS, and GAS cohorts. A post-hoc test, the Dunn-Bonferroni-Tests was also used to find out which of the pairs differ.

Ethical Consideration

To initiate this process, the researchers sought permission from the School Principal to conduct the study from validation and pilot testing to data gathering among the Senior High School students. The mechanism of the study was disclosed to the participants through an informed consent. Confidentiality and anonymity were also ensured.

RESULTS AND DISCUSSION

The researchers captured the effects of utilizing ChatGPT on students' academic engagement, efficiency, autonomy, and overall learning experience. The following results were obtained from the respondents through survey

questionnaires.

The result (Table 1) demonstrates how ChatGPT affected the engagement and motivation of students towards their studies showed that the students use ChatGPT rarely (47.95%) for homework purposes (36.99%) in English (39.73%), Science (17.81%) and Social Science (17.81%) subjects because these subjects require written outputs. Thereby, slightly increasing (43.84%) their academic engagement because it takes them less time (38.36%) completing their homework. Hence, the respondents likely recommend (49.32%) ChatGPT to other students.

Mohebi's (2024) review of 32 peer-reviewed articles from 2023 found that 75 percent of the studies emphasized its relevance to

SOP 1. Student engagement

postsecondary education. Similarly, Muñoz et al. (2023) found a significant correlation between the level of experience of instructors and the listening skills and learning interest of their students. ChatGPT had a substantial effect on engagement and motivation, with exceptionally knowledgeable instructors playing a pivotal role in this regard. Hence, policy should encourage its integration into education.

However, the respondents are neutrally (34.35%) satisfied with the quality and accuracy of the content generated by ChatGPT. The low quality and accuracy satisfaction that agrees with the capacity of ChatGPT to generate inefficient content and facilitate personalized learning

Table 1. Academic Engagement

Questions	Option	TOTAL (N=73)	%
Q1. How often do you use Chat GPT for your academic tasks?	A. Daily	2	2.74
	B. Weekly	21	28.77
	C. Monthly	9	12.33
	D. Rarely	35	47.95
	E. Never	6	8.22
Q2. For which academic tasks do you use Chat GPT?	A. Homework	27	36.99
	B. Research	24	32.88
	C. Writing assignments	14	19.18
	D. Other (please specify)	8	10.96
Q3. In which subject areas do you use Chat GPT?	A. English	29	39.73
	B. Sciences (Chemistry, Biology, etc.)	13	17.81
	C. Mathematics	10	13.70
	D. Social Science	13	17.81
	E. Research	7	9.59
Q4. Has the use of Chat GPT affected your engagement or interest in your studies?	A. Increased significantly	18	24.66
	B. Increased slightly	32	43.84
	C. No change	12	16.44
	D. Decreased slightly	8	10.96
	E. Decreased significantly	3	4.11
Q6. Would you recommend Chat GPT to other students?	A. Yes	36	49.32
	B. No	12	16.44
	C. Not sure	25	34.25
Q7. Have you noticed any changes in the time it takes to complete assignments since using Chat GPT?	A. Significantly less time	17	23.29
	B. Slightly less time	28	38.36
	C. No change	13	17.81
	D. Slightly more time	8	10.96
	E. Significantly more time	7	9.59
Q15. How satisfied are you with the quality and accuracy of the content generated by Chat GPT?	A. Very dissatisfied	16	21.92
	B. Dissatisfied	11	15.07
	C. Neutral	25	34.25
	D. Satisfied	18	24.66
	E. Very satisfied	3	4.11
Q19. How do you evaluate the reliability and credibility of the information provided by Chat GPT?	A. I do not check the sources or references used by Chat GPT.	11	15.07
	B. I check the sources or references used by Chat GPT but I do not verify them.	14	19.18



C. I check and verify the sources or references used by Chat GPT.	26	35.62
D. I check, verify, and compare the sources or references used by Chat GPT with other sources.	14	19.18
E. I check, verify, compare, and critique the sources or references used by Chat GPT with other sources.	8	10.96

(Mohebi, 2024) leads the respondents to still check and verify the sources or references to check the reliability and validity of information provided by Chat GPT (Rose, 2023). Hence, this offers prospects for revolutionizing educational encounters between AI and human educators to facilitate dynamic, inclusive learning. Without significantly altering fundamental teaching methods, teachers must assess the capabilities of AI today and pinpoint potential avenues for improving student learning (Zhai et al., 2021).

Overall, the results illustrate the dynamic relationship between the utilization of technology and the cognitive, affective, and behavioral dimensions of student engagement

(Yan, 2023; Hakiki et al., 2023; Yanowsky-Reyes, 2023).

SOP 2. Academic Efficiency

Academic efficiency is a complex concept that may encompass a range of underlying elements, including knowledge retention, comprehension, and application (Delahoz-Domínguez et al., 2021; De Witte & López-Torres, 2017; Alyahyan & Düştegör, 2020; Berhanu & Sabanci, 2020). Student responses (Table 2) to this construct demonstrate a substantial quantity of responses that suggest an improvement (63.01%) in their academic efficacy due to slightly less time (38.36%) it takes that helped them slightly improved their understanding (49.32%) of new concepts in English (42.47%) and Science (31.51%) subjects.

Table 2. Academic Efficiency

Question	Option	TOTAL (N=73)	%
Q5. Have you noticed any changes in your academic performance since you started using Chat GPT?	A. Improvement	46	63.01
	B. No change	27	36.99
	C. Decline	1	1.37
Q7. Have you noticed any changes in the time it takes to complete assignments since using Chat GPT?	A. Significantly less time	17	23.29
	B. Slightly less time	28	38.36
	C. No change	13	17.81
	D. Slightly more time	8	10.96
	E. Significantly more time	7	9.59
Q8. Have you noticed any changes in your understanding of new concepts since using Chat GPT?	A. Understanding significantly improved	10	13.70
	B. Understanding slightly improved	36	49.32
	C. No change	15	20.55
	C. Understanding slightly worsened	9	12.33
	E. Understanding significantly worsened	3	4.11
Q9. In which subjects have you noticed these changes?	A. Mathematics	7	9.59
	B. Science	23	31.51
	C. English	31	42.47
	D. Social Studies	7	9.59
	E. Research	11	15.07
Q20. How do you integrate the content generated by Chat GPT with your own ideas and knowledge?	A. I copy and paste the content generated by Chat GPT without any changes	7	9.59
	B. I copy and paste the content generated by Chat GPT with minor changes	29	39.73
	C. I paraphrase the content generated by Chat GPT	17	23.29
	D. I paraphrase and synthesize the content generated by Chat GPT with my own ideas and knowledge.	15	20.55
	E. I use the content generated by Chat GPT as a reference or inspiration for my own original work.	5	6.85

Q21. How do you cite and acknowledge the sources used by Chat GPT?	A. I do not cite or acknowledge the sources used by Chat GPT.	13	17.81
	B. I cite or acknowledge the sources used by Chat GPT inconsistently or incorrectly.	23	31.51
	C. I cite or acknowledge the sources used by Chat GPT consistently and correctly.	22	30.14
	D. I cite or acknowledge the sources used by Chat GPT and Chat GPT itself consistently and correctly.	9	12.33
	E. I cite or acknowledge the sources used by Chat GPT and Chat GPT itself and provide a rationale for using Chat GPT as a learning tool consistently and correctly.	6	8.22

In support of the data presented, Mahapatra's (2024) research revealed that ChatGPT significantly and positively impacted the students' academic writing skills. An additional pertinent article is "ChatGPT and Academic Research: A Review and Recommendations Based on Practical Examples," revealed that ChatGPT may be a useful instrument for generating initial concepts for academic scientific research (Rahman et al., 2023).

However, the respondents integrate the content generated by ChatGPT in their works by copying and pasting with minor changes (39.73%) only and do not cite or acknowledge the sources used by Chat GPT correctly (31.51%). The data shows that ChatGPT users face problems of academic integrity when it comes to literature synthesis, citations, problem statements, identifying research gaps, and data analysis (Yeo, 2023). To address academic integrity, students are advised to disclose any utilization of A.I. technology in their academic endeavors. It is imperative that they properly attribute any content (text, image, data, or otherwise) produced using an A.I. tool, whether it be paraphrased, quoted, or integrated into their own work (LibGuides: Scholarly Use of A.I. Tools: Cite A.I. Generated Text, n.d.). Furthermore, according to an article entitled "AI & Academic Integrity" published by the Center for Teaching Innovation, it is the responsibility of every instructor to deliberate on how they will furnish explicit directives for the utilization of

generative AI in scholarly assignments for each course they instruct. To reduce the likelihood of academic integrity violations, instructors must convey the course's generative AI policies explicitly (AI & Academic Integrity | Center for Teaching Innovation, n.d.). Conversely, El-Seoud et al. (2023) stressed that ongoing assessment and responsible implementation is important regarding the impact of ChatGPT on academic achievement and learning outcomes.

When it comes to grading assignments generated by ChatGPT, academic staff have several options to address these issues. First, faculty members can provide students with precise guidance on how to organize their tasks. This can guarantee that the assignments are written in a way that is more organized and logical. Second, a rubric can be used by faculty members to assess the caliber of student work. This can make it more likely that the student's work and comprehension of the subject matter will be fairly evaluated. Lastly, to gauge a student's comprehension of the subject, academic staff members might employ both computerized and manual evaluation methods. By doing so, it may be possible to verify the student's actual comprehension level (Caulfield, 2023; Ellis & Ellis, 2023; 5 Assignment Design Ideas for ChatGPT in Computer Science Education | CodeGrade Blog, n.d.).

SOP 3. Learner Autonomy

Academic autonomy assesses the degree to which students navigate their own learning paths, demonstrate adaptability, and resolve challenges within the context of contemporary education (Rittschof, 2008; Saracho, 2020). Based on the results in Table 3, Chat GPT has increased the learning

autonomy (32.88%) of students by decreasing their reliance on conventional resources such as textbooks (36.99%) although there is no change in tutoring (38.36%). Furthermore, the respondents monitor or regulate their own learning process when using Chat GPT frequently or deeply (43.84%).

Table 3. Learner Autonomy

Question	Option	TOTAL (N=73)	%
Q11. Has the use of Chat GPT helped you become more independent in your learning process?	Significantly more independent	23	31.51
	Slightly more independent	24	32.88
	No change	17	23.29
	Slightly less independent	4	5.48
	Significantly less independent	5	6.85
Q12. Has the use of Chat GPT decreased your dependence on textbooks?	Significantly decreased	12	16.44
	Slightly decreased	27	36.99
	No change	20	27.40
	Slightly increased	10	13.70
	Significantly increased	4	5.48
Q13. Has the use of Chat GPT decreased your dependence on tutoring?	Significantly decreased	7	9.59
	Slightly decreased	26	35.62
	No change	28	38.36
	Slightly increased	9	12.33
	Significantly increased	3	4.11
Q22. How do you monitor and regulate your own learning process when using Chat GPT?	A. I do not monitor or regulate my own learning process when using Chat GPT	17	23.29
	B. I monitor or regulate my own learning process when using Chat GPT occasionally or superficially.	7	9.59
	C. I monitor or regulate my own learning process when using Chat GPT regularly or moderately.	9	12.33
	D. I monitor or regulate my own learning process when using Chat GPT frequently or deeply.	32	43.84
	E. monitor or regulate my own learning process when using Chat GPT and reflect on the strengths and weaknesses of using Chat GPT as a learning tool frequently or deeply.	8	10.96

Similarly, Hartley et al. (2024) examined the potential of ChatGPT as an evaluative case study tool for autonomous learning, with a specific focus on coding instruction. The research discovered that ChatGPT offered thorough direction and efficiently aided in the process of strategizing. However, it emphasized the significance of learners possessing metacognitive abilities to evaluate its constraints (Hartley et al., 2024). The function of ChatGPT in facilitating

complex and personalized learning was the subject of another study (Alejandro Guadalupe Rincón Castillo et al., 2023), which suggested that it could potentially increase students' learning independence and streamline critical processes.

SOP 4: Overall Learning Outcomes

The questions concerning comprehensive learning encompass elements that impact every facet of a

student's academic journey, such as the acquisition of knowledge, development of skills, and academic achievement.

Rank Variance Test Statistics, H	29.97 43.03
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According to the H value of 43.03 (Table 4), it surpasses the critical value (5.991) for the degrees of freedom (df=2) at a specified level of significance (0.05), it suggests that at least two of the groups (STEM, CSS, GAS) exhibit a statistically significant disparity in the overall learning outcomes.

Since the result is significant, a post-hoc test was done to find out which of the pairs differ. Using the Dunn-Bonferroni-Tests of 5.35 (STEM & CSS), 5.07 (CSS & GAS), and 5.06 (STEM & GAS), the null hypothesis that there is no difference is rejected. Since the adjusted p-value is smaller than 0.05, it is assumed that the respective two groups differ.

Table 4. Overall Learning Outcome

Questions	OPTION S	STEM	RANK	CSS	RANK	GAS	RANK
1	D. Rarely	1	27	8	12	26	2
4	B. Increase slightly	5	20	5	20	22	5
5	A. Improvement	12	10	6	15	28	1
8	B. Understanding slightly improved	7	14	6	15	23	4
10	C. Neutral	1	27	5	20	24	3
14	B. Somewhat positive	6	15	2	26	18	7
16	D. Increase a little	4	23	4	23	12	10
17	B. Hinders little	6	15	6	15	15	8
18	B. Impedes a little	8	12	3	25	14	9
23	C. I use Chat GPT and other learning strategies and resources equally.	1	27	0	30	21	6
	Rank Mean Expected Value of Rankings		19		20.1		5.5
	Df				2		

CONCLUSION

The study investigated the frequency and impact of Chat GPT on students' academic tasks, its impact on engagement, time completion, learning independence, and overall learning experiences among three learning groups.

1. ChatGPT, a popular academic tool, has a positive impact on student engagement, and academic efficiency reducing task completion time and improving comprehension in English and Science. However, academic integrity concerns arise as many students incorporate ChatGPT-generated material with minor modifications and neglect proper citation, highlighting the need for improved instruction on citation methods and ethical use of AI-generated materials.
2. ChatGPT positively impacts students' academic autonomy, reducing reliance on traditional study resources like textbooks. It allows self-regulation and monitoring of learning. However, it is important to note that ChatGPT functions as a supplement to these resources rather than a substitute.
3. There are significant differences in the impact of ChatGPT on learning outcomes across STEM, CSS, and GAS groups. These findings suggest that the effectiveness of ChatGPT may vary depending on the academic concentration of students and the subject matter. Therefore, educators and researchers should

consider these results when designing instructional approaches involving ChatGPT.

a longer period is also recommended to further establish the result.

RECOMMENDATIONS

While positive impact of ChatGPT were found essential to the students' engagement, efficiency, autonomy and overall learning outcomes, the following points are for future consideration:

1. The study suggests that Chat GPT can boost student engagement, efficiency, writing skills and academic performance of the Grade 12 students. However, instructors should promote responsible usage by providing specialized sessions for enhancements of capabilities of literature synthesis and citation practices, problem statement formulation, research gaps identification, data analysis, and continuous monitoring.
2. It is recommended that the utilization of Chat GPT be aligned with learning objectives to encourage critical thinking, foster digital literacy, personalize learning experiences, and assess its impact on learner autonomy to aid students in their educational endeavors.
3. It is recommended to tailor the integration of ChatGPT to the specific needs of various academic groups, devise a range of instructional approaches, and undertake additional research to ascertain its effects on distinct student groups. This will contribute to improved learning outcomes in various academic fields. Further study involving equal grouping and larger samples in

4. In response, the researchers will organize a seminar-workshop on "Empowering Students: Navigating the Digital Landscape with ChatGPT" centered around the appropriate use of ChatGPT, which will enhance students' learning. This seminar can address issues like how to use ChatGPT to improve learning engagement, how to critically assess responses generated by ChatGPT, how to integrate ChatGPT content ethically into academic work, and how to maximize ChatGPT's advantages while minimizing its potential drawbacks, like overreliance or plagiarism. Through the provision of all-encompassing advice and assistance, these seminars can enable students to fully utilize ChatGPT as an educational tool, resulting in improved learning outcomes and academic achievement.

Disclosure statement. *The authors report that there are no competing interests to declare.*

Declaration of Generative AI and AI-assisted technologies in the writing process. *During the preparation of this work, the author(s) used ChatGPT as a guide in outlining the research. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.*

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