



Perspectives of UNISMA mathematics education students in 2023 on the use of artificial intelligence chat GPT in the preparation of seminar proposals

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Abstract. This study explores the perspectives of UNISMA 2023 Mathematics Education students on the use of Artificial Intelligence (AI) ChatGPT in seminar proposal writing. The research method used a qualitative descriptive approach with observation and interviews of 15 students who had participated in seminar proposal activities. Of these, 7 students chose to use ChatGPT in the proposal writing process. The results showed that some students were interested in using ChatGPT as a tool to improve the efficiency and quality of their seminar proposal writing. Analysis of the interviews with the seven respondents revealed that ChatGPT could be useful for paraphrasing, searching for definitions, and structuring sentences. Although aware of the risk of plagiarism, the respondents tried to avoid it by paraphrasing manually. Discussion of the research results reflects similar findings in previous studies, which show the effectiveness of ChatGPT in learning and task preparation. Although it makes a positive contribution, caution and responsibility are needed in its use to avoid plagiarism and ensure academic integrity. In conclusion, the use of ChatGPT can be a useful additional tool in the context of seminar proposal writing, provided it is used wisely and integrated with manual writing efforts.

Keywords: Chat GPT, Students, Mathematics Education, Seminar Proposal

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Introduction

Chat Generative Pre-training Transformer (GPT) is a development service developed by OpenAI, an artificial intelligence (AI) research and application laboratory based in San Francisco, United States. OpenAI's mission is to ensure that Artificial General Intelligence (AGI), which is software that has human-level intelligence, can benefit many people (Wairisal, 2023). GPT uses a chatbot system, a computer program designed to stimulate conversation or interactive communication with users through text, voice, or visuals (Lelepary et al., 2023). This technology uses machine learning and Natural Language Processing (NLP) algorithms to understand and process information typed by humans in detail. Through these algorithmic capabilities, ChatGPT can answer questions, help users find information, translate languages, and generate new text that resembles human writing (Damayanti & Hermanto, 2023). ChatGPT technology also uses

deep learning algorithms, which provide information for solving problems according to human needs quickly. The responsiveness of this application is supported by the application of NLP, which allows ChatGPT to understand, interpret, and manipulate human language or commands (Putra et al., 2023).

Based on the efficiency and functionality it offers, ChatGPT has become one of the most widely used platforms across various demographics. In fact, ChatGPT set a record as the fastest online service platform to reach 1 million users in just 5 days since its introduction, while other major platforms such as TikTok and Instagram generally take 2 to 5 months to reach the same number of users (Purnama et al., 2023). Data from Similarweb also shows that ChatGPT is regularly visited by 1.8 billion internet users every month, indicating that this platform has become popular and widely used throughout the world, including in Indonesia. One of the main advantages of ChatGPT is its extraordinary size, with 175 billion parameters, making it one of the largest language models available today (Misnawati, 2023). This size provides advantages in terms of the model's ability to understand and generate text with a high level of complexity, reinforcing its reputation as a highly advanced language model.

Since its release, ChatGPT has been used in various applications, including language translation, content creation, and language modeling. In the context of translation, ChatGPT has proven capable of translating between languages with a high degree of accuracy (Hakiki et al., 2023). Additionally, its ability to summarize long documents coherently and informatively has strengthened its position as an effective language model for presenting information concisely yet comprehensively. Another significant application of ChatGPT is in content creation. ChatGPT has been used to generate articles, stories, and various other types of written content. For example, in a study conducted by Faiz & Kurniawaty (2023), ChatGPT successfully created content that was difficult to distinguish from text written by humans. The use of ChatGPT in content creation brings a number of benefits. Some users report that the text generated by ChatGPT is difficult to distinguish from human work, demonstrating the sophistication of this model in responding to commands and producing coherent output (Alfaiz & Julius, 2023). While this creates new opportunities for creativity and productivity, it also raises ethical concerns. One of the main concerns is the potential for misuse, especially in the context of creating "fake news" or manipulating public opinion (Faradiba et al., 2022a). Several studies and thoughts, as expressed by Pontjowulan (2023), highlight the risks associated with using ChatGPT to spread misinformation or design narratives that could influence public opinion.

However, ChatGPT has also been considered a tool that can help writers and content creators. This model can be used to generate creative ideas, break writing blocks,

and assist in overcoming repetitive or time-consuming content tasks (Setiawan et al., 2023). Its use as a creative tool can expand human capabilities in creating content more efficiently. In order to mitigate the risk of misuse, the use of ChatGPT in content must be accompanied by ethical policies, careful fact-checking, and transparency regarding the source of the generated text (Diantama, 2023). The role of oversight and regulation is also important to ensure that this technology is used responsibly and does not harm the interests of society at large.

In the world of education, the use of ChatGPT has sparked various pros and cons. Although it is recognized that ChatGPT has great potential to advance the academic world by increasing learning motivation, active engagement, and problem-solving skills (Rosyanafi et al., 2023), there are also several concerns regarding its negative impacts. The pros of using ChatGPT in education include its ability to increase student motivation and active engagement. This model can be used as an innovative learning tool, providing assistance in problem solving and creating a more engaging learning experience (Shidiq, 2023). The implementation of ChatGPT as an online service can also be a very helpful addition to the learning process at the school level. However, on the other hand, there are several cons that need to be considered. One of the main concerns is that dependence on ChatGPT can make learners complacent and reduce their critical thinking skills. The easy and quick availability of information from ChatGPT can reduce the motivation to think critically or elaborate on information further. Additionally, there is concern that the use of ChatGPT may replace the use of more accurate learning media, such as books, journals, and resources provided by teachers (Ausat et al., 2023). This can hinder the development of students' research skills, deep understanding, and independence, which are important aspects of the educational process. It is important to find the right balance in the use of ChatGPT in educational settings. While it can be an effective tool, the role of teachers in guiding students, encouraging critical thinking, and ensuring the accuracy of information remains crucial. Careful regulation and an approach focused on developing students' critical and independent skills can help maximize the positive potential of this technology while addressing the risks and concerns that may arise.

Several international and national universities have responded to the use of ChatGPT by implementing certain internal policies. For example, universities in New South Wales (NSW), Queensland, and Tasmania have taken preventive measures by blocking access to ChatGPT on their campus internet networks. This step was taken in an effort to prevent the use of ChatGPT in the examination process, which could potentially jeopardize the integrity of the examination and the authenticity of students' work (Wahid et al., 2023). In addition, several national universities, such as Padjadjaran University, have also imposed rules and sanctions related to the use of ChatGPT. One example is the

imposition of sanctions in the form of grade reductions for students who are proven to have committed plagiarism in completing assignments or exams with the help of ChatGPT. This step was taken to curb academic cheating and ensure that students produce work that is the result of their own thoughts and efforts (M. S. Maulana et al., 2023). The implementation of such internal policies reflects the response of higher education institutions to technological developments, especially those related to artificial intelligence, in order to maintain academic integrity and values (Maulana et al., 2023). These measures also aim to prevent the use of such technology that could be detrimental to the educational process and challenge aspects of honesty and independence of students in completing assignments or exams.

The perspective of UNISMA Mathematics Education students in 2023 on the use of Artificial Intelligence (AI) ChatGPT in preparing seminar proposals reflects two sides of a view that needs to be balanced. Some students may see the use of AI technology as an innovative tool that helps generate ideas and overcome creative barriers in preparing proposals. On the other hand, there are also concerns about the risk of over-reliance on this technology, which can reduce critical thinking activities and students' ability to formulate mathematical concepts independently. Therefore, it is important for Mathematics Education students to design a wise AI usage policy, combining the advantages of this technology without sacrificing the essence of the learning process and the development of analytical thinking skills.

Method

This study aims to explore the perspectives of UNISMA 2023 Mathematics Education students on the use of Artificial Intelligence (AI) ChatGPT in preparing seminar proposals. The research method used is a qualitative descriptive approach, which involves observation, interviews, and literature study. The research population consists of 45 seventh-semester Mathematics Education students at the Islamic University of Malang in 2022/2023. Fifteen of them had conducted seminar proposals on November 13, 2023. Of these, seven students had used ChatGPT in preparing their seminar proposals. This study will use observation to observe the process of preparing seminar proposals using ChatGPT by students. This observation will provide an overview of the effectiveness and role of AI in assisting students.

Furthermore, in-depth interviews will be conducted with the 7 students who have used ChatGPT. These interviews will focus on the experiences, challenges, and benefits gained by students in using ChatGPT. Interview questions may cover aspects such as ease of use, accuracy, and the contribution of AI in improving the quality of seminar proposals. A literature study will be used to support understanding of basic AI concepts and previous

approaches related to the use of technology in the context of mathematics education.

Data analysis will be conducted by identifying patterns of findings from observations, interviews, and literature studies. Conclusions will be drawn based on these findings, providing a comprehensive overview of how UNISMA 2023 Mathematics Education students assess the use of ChatGPT in preparing seminar proposals. This research is expected to contribute to our understanding of the impact of AI, particularly ChatGPT, in the context of mathematics education. The results of this study can also serve as a basis for the development of more effective and innovative teaching methods in the future.

Results and Discussion

Artificial intelligence (AI) technology is experiencing rapid development and has a significant impact on various aspects of human life. The World Economic Forum (WEF) even estimates that around 83 million jobs will be lost due to the increasingly widespread use of AI. According to a report from the Populix research platform, as many as 45% of internet users in Indonesia, including workers and entrepreneurs, admit to having used AI applications. The reason is that they believe that the use of AI applications can increase effectiveness and productivity in their work. In this context, ChatGPT is the most frequently used AI platform, reaching 52% of respondents, followed by Copy.ai, Luminar AI, Oracle, Dall-e, Lalal.ai, and Outmatch. The majority of respondents (75%) stated that the use of AI platforms was due to the availability of tools to support their work, while 53% saw that AI platforms provided many templates to support their tasks. Some respondents also felt that AI platforms helped them find ideas (44%), while others (26%) used these platforms because they were required to do so by their office, campus, or institution. Populix also noted that the presence of AI platforms helped increase employee creativity and facilitated participation in various training programs. Apart from AI, the Populix survey also shows that Zoom meetings are the most frequently used platform (77%) to support work, followed by Google Workspace (54%), Microsoft Teams (30%), and Skype (24%). Zoom also dominates as the most widely used platform by companies with 68%.

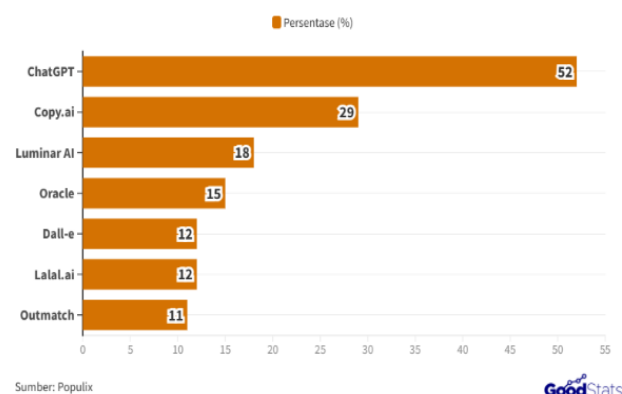


Figure 1. Data on the Most Frequently Used AI Platforms in Indonesia Source GoodStats
from Populix, Survey Period April 2023

In UNISMA Mathematics Education 2023, observations show that out of a total of 45 seventh-semester students, 15 of them have participated in proposal seminars. Of these, seven students chose to use ChatGPT, a chat-based Artificial Intelligence (AI) technology, in the process of preparing their seminar proposals. This reflects the interest of some students in utilizing AI technology as a tool to improve the efficiency and quality of their seminar proposal preparation. This perspective illustrates that the use of ChatGPT among Mathematics Education students can be an attractive alternative in supporting their academic activities, although it is still necessary to consider how the integration of this technology can contribute positively to the quality and originality of students' scientific work. The following is a table analyzing the interview results from each respondent:

Table 1. Analysis of Interview Results with Respondents Regarding the Use of ChatGPT in
Preparing Seminar Proposals

No.	Respondents	Interview Conclusions
1.	Respondent 1	Respondent 1 knows ChatGPT as a form of artificial intelligence that operates through conversation. The respondent uses ChatGPT to help draft seminar proposals, although only occasionally due to the limitations of ChatGPT's resources. This respondent's experience with ChatGPT is limited to developing a single sentence into a paragraph, paraphrasing it themselves to improve their writing skills. Although aware that ChatGPT's writing can be detected as plagiarism, this respondent avoids plagiarism by paraphrasing themselves. Despite only using ChatGPT a little, the respondent considers this tool to be very helpful in improving their seminar proposal writing skills. In recommending the use of ChatGPT to other students, the respondent emphasizes the importance of caution, thoroughness, and paraphrasing their own work to ensure the originality and quality of their writing.
2.	Respondent 2	Respondent 2 views ChatGPT as a widely used website used by various groups, from elementary schools to universities, to find answers or information. The respondent confirmed that they use ChatGPT to prepare seminar proposals, especially to find definitions or specific steps. Although they have only used ChatGPT once, this respondent stated that this tool can help in finding definitions, steps, and other necessary information. Although they did not know whether ChatGPT's writing could be detected as plagiarism, this respondent avoided plagiarism by paraphrasing every sentence generated by ChatGPT. Despite still feeling unfamiliar with ChatGPT, the respondent recommended its use to other students, stating that ChatGPT can provide answers to questions, definitions, and other information needed in preparing seminar proposals.
3.	Respondent 3	Respondent 3 identified ChatGPT as artificial intelligence or AI that provides informative answers. Respondents actively use ChatGPT in preparing seminar proposals, especially to paraphrase sentences in the proposal. Their experience using it has been very positive, stating that ChatGPT helps them complete proposals on time through sentence paraphrasing. To improve their writing skills, respondents use ChatGPT to get advice and guidance on arranging sentences in proposals, thereby improving their writing. Although aware that ChatGPT's writing can be detected as plagiarism, these respondents avoid this by rephrasing ChatGPT's

		paraphrases in their own words. While recommending the use of ChatGPT to find seminar proposal topics because of its many interesting topics and ideas, respondents also cautioned against its use, especially for theses, because ChatGPT's knowledge is not considered scientific knowledge, and still recommends using references from journals and other articles.
4.	Respondent 4	Respondent 4 stated that ChatGPT is an AI technology that provides information, general knowledge, and various points related to specific topics. Although the respondent rarely uses ChatGPT in preparing seminar proposals, its use is limited to obtaining references related to general understanding and indicators to be included in the proposal. Respondents see that ChatGPT's language structure capabilities can help with proposal writing by improving vocabulary and language structure. Although aware that ChatGPT's writing can be detected as plagiarism, this respondent minimizes its use and avoids plagiarism by using other websites such as Perplexity, as well as paraphrasing words that may trigger plagiarism. Although they feel that ChatGPT can help improve proposal writing skills, respondents do not recommend its direct use in proposal writing because each university has different requirements. However, respondents see added value in using it as additional reading or reference material because of the detailed and easy-to-understand explanations provided by ChatGPT. provided by ChatGPT are detailed and easy to understand.
5.	Respondent 5	Respondent 5 describes ChatGPT as AI technology configured with the intelligence to answer questions asked by users. In the context of preparing seminar proposals, respondents used ChatGPT mainly to paraphrase sentences. Although they did not know whether ChatGPT's writing could be detected as plagiarism, respondents noted that its use helped them construct sentences well and provided a wide variety of vocabulary. Respondents also felt that their writing skills improved after using ChatGPT, especially in terms of sentence structure and vocabulary relations. Although they recommend the use of ChatGPT to other students because it can help with paraphrasing and good sentence structure, Respondents also advised caution regarding the sources used so as not to cause uncertainty.
6.	Respondent 6	Respondent 6 explained that ChatGPT is a leading chatbot application that uses artificial intelligence to provide quick, intelligent, and accurate responses to user commands and questions. In the context of preparing a seminar proposal, this respondent used ChatGPT to find focus in the structure of the proposal, especially in finding relevant examples. Although ChatGPT was sufficient, the respondent also refined and paraphrased the content of the proposal themselves, as well as seeking the views of experts relevant to the topic. The respondent felt that ChatGPT helped improve their writing skills by presenting a systematic and standard language, similar to the language used in theses taught at university. Although they did not know whether ChatGPT's writing could be detected as plagiarism, the respondents always paraphrased independently to avoid plagiarism. While recommending the use of ChatGPT, the respondents advised that it be used responsibly and noted that the use of this technology requires an understanding to refine the results provided.
7.	Respondent 7	Respondent 7 explained that ChatGPT is an artificial language model developed by OpenAI. Respondents use ChatGPT as a tool to help them write seminar proposals, although they do not always use it regularly. They said that their experience using ChatGPT to write seminar proposals was quite positive because it could provide ideas when they lacked inspiration and help give additional structure to their writing. ChatGPT helps increase creativity and provides additional suggestions for developing ideas in seminar proposals. Respondents are aware that ChatGPT's writing results can be detected as plagiarism, therefore, respondents always carefully check, edit, or paraphrase ChatGPT's writing results to avoid plagiarism. According to the respondent, using ChatGPT can improve writing skills because it provides additional perspectives and helps enrich ideas in creating proposals. However, the respondent emphasized the need to use ChatGPT wisely, by reviewing, editing, or paraphrasing manually to ensure the authenticity and quality of the writing. Although recommending the use of ChatGPT as an additional tool,

the respondent suggested that it be used wisely and integrated with manual writing efforts to achieve the best results.

Source: Results of Student Observations and Interviews

Based on the results of interviews with seven respondents regarding the use of ChatGPT

Based on the results of interviews with seven respondents regarding the use of ChatGPT in drafting seminar proposals, several general conclusions can be drawn. Respondent 1 considers ChatGPT to be an artificial intelligence tool that operates through conversation and uses it to help draft seminar proposals by paraphrasing. Respondent 2 sees ChatGPT as a website that is widely used to find answers or information, and even though they have only used ChatGPT once, they feel that this tool can help in finding definitions and steps. Respondent 3 actively uses ChatGPT to paraphrase in proposal writing and feels that ChatGPT helps complete proposals on time. Respondent 4, although rarely using ChatGPT, sees that the tool's language structure capabilities can help with proposal writing. Respondent 5 uses ChatGPT mainly for paraphrasing in proposal writing and feels that this tool helps improve writing skills. Respondent 6 uses ChatGPT to find focus in proposals and feels that this tool helps improve writing skills. Respondent 7, although not always using ChatGPT, feels that this tool provides additional ideas and structure in proposal writing and can enhance creativity.

In general, the respondents are aware that ChatGPT's writing can be detected as plagiarism. Therefore, they make efforts to avoid plagiarism by paraphrasing themselves, editing, or double-checking ChatGPT's writing. Although the use of ChatGPT is considered helpful in drafting seminar proposals and improving writing skills, the respondents also cautioned to use this tool wisely. They emphasized the need for manual review, editing, or paraphrasing to ensure the originality and quality of the writing. Some respondents also suggested that ChatGPT be integrated with manual writing efforts and that caution be exercised in sourcing. Although there were some differences in the experiences and views of the respondents, overall, ChatGPT can be a useful additional tool in drafting seminar proposals, provided that it is used wisely and responsibly.

Discussion

In this study, the researchers identified similar studies on Chat GPT used in education. Based on the results of a study conducted by Sholihatin et al. (2023), the use of Chat GPT technology in Indonesian language learning in the digital era received positive responses from most mathematics education students at the Islamic University of Malang. This study shows that Chat GPT technology is effective in assisting the learning process and increasing learning activities, both individually and collectively. Students felt that it helped them complete difficult Indonesian language assignments, improve their grammar skills, expand their vocabulary, and enhance their communication skills. The data and research results also show that Chat GPT technology has a positive impact on improving Indonesian language learning, with an overall positive response from students. The presence of this technology made a difference in the learning outcomes between students who used

Chat GPT technology and those who did not, with a difference of 85.4%. These differences include improvements in vocabulary and grammar skills. However, this study highlights the importance of using Chat GPT technology as a tool, not a substitute for comprehensive learning. There is a need to develop interesting and interactive materials as well as training for teachers and students to maximize the benefits of this technology.

Several relevant literature studies include the research conducted by Kusumaningtyas, et al. (2023), which found that technological developments, particularly the emergence of Chat GPT (Generative Pre-trained Transformer), have had a positive impact on the world of education. Chat GPT, which operates based on a chat model, has become a trend in society, especially in the field of education. Students can utilize Chat GPT to facilitate the completion of assignments essays, compose texts, obtain suggestions, generating ideas, and assisting with sentence and paragraph structure. However, this study notes that the convenience provided by Chat GPT is not without risk. The originality of the answers generated is not always 100% accurate, and excessive use of Chat GPT can cause students to engage in plagiarism, making them less responsible in completing their assignments. Nevertheless, researchers emphasize that guidance and supervision can help students maximize the use of technology, such as Chat GPT, properly and correctly. If used wisely, Chat GPT has the potential to provide significant benefits to student learning in this era of advanced technology.

Furthermore, based on another literature study conducted by Priowirjanto, et al. (2023), it can be seen that understanding of ChatGPT and its use has increased among teachers and students at SMK Al-Wafa. The majority of respondents have heard of ChatGPT and have a basic understanding of this technology. Most of those who have used ChatGPT stated that this technology is useful for finding information and assisting in the learning process. However, there are concerns regarding the negative impacts of using ChatGPT, such as dependence and a decline in student creativity. Through socialization regarding the legal aspects of using ChatGPT in education, teachers and students at SMK Al-Wafa are expected to increase their understanding of the use of this technology. Knowledge of the legal basis for using ChatGPT, especially regarding what is prohibited, required, and permitted by law, is considered important. However, there are still several questions and concerns that need to be answered and addressed, such as the validity of the answers provided by ChatGPT and the protection of intellectual property rights.

According to one lecturer who served as a respondent in another literature study conducted by Saputra and Hidayati (2023), the use of ChatGPT in the context of learning raises several important points. Although ChatGPT can provide informative answers and explanations, it is important to remember that consultation with lecturers or other reliable sources remains essential. Lecturers can provide in-depth understanding, clarify doubts, and offer a broader perspective. The use of ChatGPT as a tool to assist in completing assignments requires the development of critical evaluation skills regarding the information provided by ChatGPT. In addition, the use of ChatGPT

can also cause students to be less critical in their thinking, reduce the quality of learning, and affect students' ability to think independently. The risk of plagiarism also arises, and students are advised not to rely entirely on ChatGPT. Apart from plagiarism, the use of ChatGPT can also eliminate the humanistic aspect of learning, as it cannot replace the social interaction that should occur between lecturers and students. Therefore, educational institutions need to consider the impact of using this technology and ensure that social interaction between lecturers and students is maintained.

The lecturer also stated that as a tool, ChatGPT makes a significant contribution to postgraduate lecturers. Lecturers can use ChatGPT to quickly access relevant information in their field, deepen their understanding of specific topics, and explore concepts further. In addition, ChatGPT can serve as an additional reference source to support the preparation of lecture materials or additional reading materials for students. However, it is important to note that ChatGPT should only be used by professionals. As stated by P5 in an interview, ChatGPT should only be used as a tool for scientific confirmation by individuals who understand the context and limitations of this technology. Unwise use can hinder critical thinking skills, and both lecturers and students should not simply rely on copy-pasting without further thought.

In another literature study conducted by Saputra and Hidayati (2023), it was also found that in today's digital era, users see ChatGPT as something very significant with great potential to revolutionize education. However, along with positive appreciation, several concerns were also expressed. Serious protection and quick responses are needed to address potential risks, such as the ban on the use of ChatGPT in New York City and Los Angeles Unified schools to prevent the risk of its use in cheating on assignments. Therefore, universities need to establish strict regulations regarding the use of technology, including ChatGPT. As stated by P5, these regulations can include plagiarism thresholds, as well as the need for coaching and training for lecturers to improve their understanding of the technology. The goal is to ensure that technology is used wisely and in accordance with regulations, while continuing to improve lecturers' competence in applying technology for more effective and innovative learning. With this training, it is hoped that lecturers will be able to overcome new challenges that arise with the rapid development of technology.

In addition, the results of another literature study conducted by Serdianus and Saputra (2023) show that the use of ChatGPT in learning planning, particularly in the stages of creating lesson plans (RPP) and developing assessment instruments, has proven to be very effective. The main advantage of using ChatGPT is time efficiency, as this technology helps overcome the problem of lack of time faced by teachers in preparing lesson plans. However, this study emphasizes that the use of ChatGPT must still be adjusted to the rules and ethics of lesson plan preparation. Therefore, even though ChatGPT provides time efficiency, the results it produces need to be adjusted to the specific format and learning needs. This conclusion opens the door to considering the use of ChatGPT as an alternative in the lesson planning process, provided that ethical adjustments and learning needs are maintained.

The research conducted by (Faradiba et al., 2022b) was qualitative and focused on the metacognitive difficulties faced by undergraduate students in solving the Fundamental Theorem of Calculus (FTC) in online learning. In this study, two of fifteen undergraduate students were selected based on several criteria. The subjects did not have dyslexia or other learning disorders according to the DSM V. Mathematical problems were given to the subjects to reveal any red flags at each stage of the mathematical problem-solving process. The analysis of the subjects' work was carried out to ensure that potential red flags resulted in metacognitive failure based on indicators of metacognitive blindness. Metacognitive blindness was identified through red flags, which are warning signs to stop or return to the previous stage in problem solving and immediately take specific actions. The three types of red flags identified in this study included lack of progress (LP), error detection (ED), and anomalous result (AR). Several errors that caused ED in the subjects in this study included reading errors, comprehension errors, transformation errors, process skill errors, and encoding errors. Encoding errors occurred at the end of the problem-solving phase. These errors could be singular (only at the end of the problem-solving phase) or not (as an effect of errors in the previous phase). Further research is also needed to confirm whether the findings in this study apply to other subjects and mathematics materials, apart from FTC. The study conducted by Faradiba et al. in 2022 was qualitative and focused on the metacognitive difficulties faced by undergraduate students in solving the Fundamental Theorem of Calculus (FTC) in online learning. In this study, two of fifteen undergraduate students were selected based on several criteria. The subjects did not have dyslexia or other learning disorders according to the DSM V. Mathematical problems were given to the subjects to reveal any red flags at each stage of the mathematical problem-solving process. The analysis of the subjects' work was carried out to ensure that potential red flags resulted in metacognitive failure based on indicators of metacognitive blindness. Metacognitive blindness was identified through red flags, namely signs warnings to stop or return to the previous stage in problem solving and immediately take specific actions. The three types of red flags identified in this study include lack of progress (LP), error detection (ED), and anomalous result (AR). Several errors that caused ED in the subjects in this study included reading errors, comprehension errors, transformation errors, process skill errors, and encoding errors. Encoding errors occur at the end of the problem-solving phase. These errors can be singular (only at the end of the problem-solving phase) or not (as an effect of errors in the previous phase). Further research is also needed to confirm whether the findings in this study apply to other subjects and mathematics materials, apart from FTC. In addressing students' metacognitive difficulties in solving the Fundamental Theorem of Calculus (FTC) in online learning, the application of artificial intelligence (AI), such as ChatGPT, can be an innovative solution. The use of this technology can enhance interaction and personal assistance in the learning process. The integration of ChatGPT as a virtual assistant can help students overcome metacognitive blindness. Virtual assistants can provide interactive metacognitive step-by-step guidance, helping students understand and overcome their difficulties.

Conclusion

Based on the results of research related to the use of ChatGPT in preparing seminar proposals by Mathematics Education students at UNISMA in 2023, it can be concluded that some students show interest in utilizing this AI technology as a tool to improve the efficiency and quality of seminar proposal preparation. However, this conclusion requires consideration of the ethics and policies surrounding the use of ChatGPT. Students who use ChatGPT are aware of the risk of plagiarism and have taken steps, such as paraphrasing themselves, to avoid this problem. Therefore, the use of ChatGPT in this context can be considered an attractive alternative, but it still requires supervision and awareness of ethical aspects. From the results of interviews with seven respondents, it can be concluded that the use of ChatGPT has a positive impact on the seminar proposal drafting process. Respondents reported that ChatGPT helped them paraphrase, improve language structure, provide additional ideas, and improve their writing skills in general. However, this conclusion is also balanced by the warning that ChatGPT's writing results can be detected as plagiarism. Therefore, caution, review, and manual editing are necessary to ensure the authenticity and quality of the writing.

In mathematics education, observations at UNISMA in 2023 show that some seventh-semester students have participated in seminar proposal activities, and some of them chose to use ChatGPT in the drafting process. This conclusion illustrates that the use of ChatGPT can be an attractive alternative in supporting academic activities, but it is necessary to consider how the integration of this technology can contribute positively to the quality and originality of students' scientific work. In addition, regarding the discussion on the regulation of ChatGPT use in higher education, the conclusion indicates the need for strict regulations to address potential risks, such as the cases of prohibition of use in New York City and Los Angeles Unified schools. Lecturers need to be provided with training and guidance to improve their understanding of this technology, while maintaining ethical standards and plagiarism policies. This conclusion reflects the need to maintain a balance between utilizing the positive potential of technology and protecting against the negative risks that may arise. With proper regulation, it is hoped that technologies such as ChatGPT can make a positive contribution to improving effectiveness and innovation in higher education.

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