



Jurnal Pendidikan Fisika

<https://journal.unismuh.ac.id/index.php/jpf>

DOI: 10.26618/jpf.v12i2.13587



The Effectiveness of Chatgpt in Completing Astronomy Lectures: Building Awareness of Its Use

Hamzarudin Hikmatiar^{1)*}, Nursina Sya'bania²⁾, Jayadin³⁾, Risqah Amaliah Kasman⁴⁾, Imranah⁵⁾, Sahlan⁶⁾ Sabarudin Saputra⁷⁾

^{1), 6), 7)} Physics Education, Universitas Muhammadiyah Maumere, Maumere, 152001, Indonesia

^{2), 3)} Chemistry Education, Universitas Muhammadiyah Maumere, Maumere, 152001, Indonesia

⁴⁾ Chemistry Department, ITK Permata Ilmu Maros, Maros, 90512, Indonesia

⁵⁾ Science Education Department, Institut Agama Islam Negeri Parepare, Pare-Pare, 91131, Indonesia

⁶⁾ Department of Information Technology, Universitas Tadulako, Palu, 94148, Indonesia

*Corresponding author: hamzarudinhikmatiar90@gmail.com

Received: December 23, 2023; Accepted: April 22, 2024; Published: April 30, 2024

Abstract – The use of ChatGPT provides new opportunities for students to deepen their understanding of the course materials and overcome the obstacles they may encounter. The study of astronomy itself includes material that studies the universe, but students tend to minimize the related knowledge. The emergence of open AI products is considered a good solution to address the acceleration of specialized student learning in tasks. This research aims to find out whether ChatGPT has benefits for students in completing astronomy lecture assignments at the Muhammadiyah University of Maumere. This is seen from how often students use ChatGPT. The research method used is a mixed method that combines quantitative and qualitative analysis. Quantitative data is obtained from questionnaires which are presented in the form of numerical data, while qualitative data is additional information obtained through conversations between researchers and research sources. Data collection is carried out using an app that is shared with students through Google Forms after ChatGPT is applied to complete college tasks. This type of activity is considered to have excellent benefits for the completion of tasks in education. Based on the research results, it was found that 13 or 65% of the total respondents stated that ChatGPT was very good to use in completing tasks. Apart from that, using ChatGPT was also considered effective in completing astronomy lecture assignments because 50% of students stated that using ChatGPT was very effective in solving astronomy problems, while the other 50% chose only effective. Based on these findings, it is fundamental that ChatGPT has benefits for students to help solve lecture problems and can be a recommendation for other users provided they always pay attention to the ethics of its use.

Keywords: astronomy; chatgpt; education; lecture assignment

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I. INTRODUCTION

In the growing digital information age, Artificial Intelligence (AI) technology has become one of the most influential innovations

in many areas of life, including learning and education. One form of AI that gets widespread attention is generative language models, such as ChatGPT (Generative Pre-

Trained Transformer) (Khan et al., 2023). The technology released on November 30, 2022, has undergone rapid advances, especially in public learning products (Maulana et al., 2023; Qi et al., 2023). The ChatGPT model, based on the GPT-3.5 architecture developed by OpenAI, can produce quality text with a high level of intelligence (Sun & Hoelscher, 2023; Floridi & Chiriatti, 2020). As an advanced chatbot, ChatGPT can meet user requests with text-based responses, such as answering simple questions, completing tasks, and addressing productivity problems (Rahman & Watanobe, 2023). In addition, with the smart command ChatGPT, it can write a scientific essay according to the subject order (Kasneji et al., 2023). The strength gained on GPT chat can be used in learning at college.

Using ChatGPT provides new opportunities for students to deepen their understanding of the curriculum and overcome obstacles. One use is in astronomy learning which studies the universe (Hikmatiar et al., 2023). However, the scope of astronomical material is very broad, this is difficult to reach with limited knowledge (Ropawandi et al., 2023). As a result, it has an impact on delays in completing (Khabibah, 2017). To anticipate these problems, the presence of ChatGPT is considered capable of solving the problems experienced (Haleem et al., 2022). Rahman & Watanobe (2023) research found that tasks completed with ChatGPT produced and presented completely new content and consistently maintained a

dialogue versus conversational style with users in a realistic manner. As for Qadir (2022) research, ChatGPT has the potential to offer personalized and effective learning experiences by providing tailored feedback and explanations to students as well as creating realistic virtual simulations for hands-on learning.

Even though the use of AI in education has high prospects through chatbots that are human-like, and have sophistication and benefits, concerns that students can misuse it still remain (Benuyenah, 2023). Research by Perkins (2023), found that violations committed by students will be determined by their educational institution. This is due to the small use of ChatGPT in education. So, in this research students were given the freedom to use ChatGPT in class to solve learning problems, but with direct supervision by the lecturer. This means that using ChatGPT cannot be separated from direct instructions from the instructor; This is done to avoid errors in using ChatGPT (Kim, 2023).

With the ease provided by AI browsing the free open ChatGPT (Mann, 2023), it should be an opportunity for them. Of the various advantages that have been shown in previous studies, it is considered appropriate by researchers to involve ChatGPT in astronomy courses at Muhammadiyah University of Maumere, in particular in solving cases that are difficult for students. In the article, researchers discuss the use of ChatGPT in

astronomy lectures. Researchers explain how students respond to ChatGPT involvement in completing learning tasks. So the research aims to find out whether using ChatGPT has benefits in completing astronomy lecture assignments.

II. METHODS

This research uses mixed methods that combine quantitative and qualitative methods (Keating et al., 2023; Weinstein et al., 2023). This combination was made to explain the research more thoroughly. This is because the two methods that are often used in research are united in the method of this research (Resnik et al., 2023). Data from the research results are mostly quantitative in a descriptive way, while some are using qualitative methods and will be explained in depth using a quantitative concept (McMullin, 2023; Lester, 2023). The qualitative method plays a more important role in carrying out content analysis on the elevator filled by students involved in research activities.

The research sample was students in the 4th semester of physics education at Muhammadiyah University of Maumere. The research sampling technique used a purposive sample where the research was carried out only on students who were taking astronomy courses. Data collection was carried out using

the technique of filling out questionnaires by students and several light conversations directly between researchers and respondents in lecture classes. Previously, students were given assignments related to astronomy several times. In completing the assignments given, lecturers require students to use ChatGPT. Every student is required to have a smartphone and internet connection to access ChatGPT. This is done to minimize cheating by students when completing assignments.

In addition, lecturers always bring together the processes carried out by students while completing assignments. This is done to limit unwanted freedom when using ChatGPT (Wang et al., 2023). Coaching is also carried out so that students always use ChatGPT without having to see the work of their friends. After doing the assignment, students filled out tickets using the Google form, which was distributed directly by the lecturer. The questionnaire was conducted to find out student responses regarding the use of ChatGPT in completing assignments and to measure its effectiveness in learning.

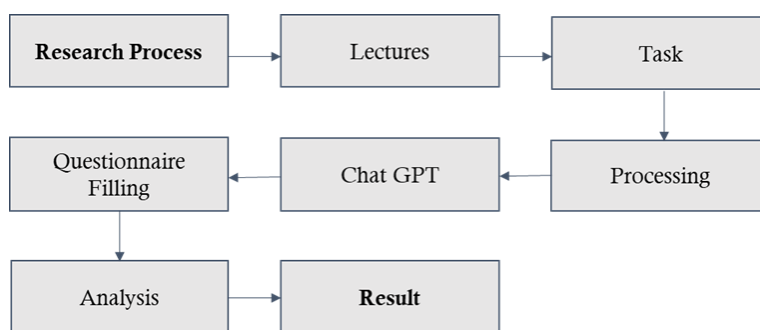
The questionnaire distributed to students included questions regarding the use of ChatGPT and their responses after using the product from AI. Some of the indicators and questions in the questionnaire can be seen in Table 1.

Table 1. Indicators and questionnaires

Indicators	Questionnaires
Get to know ChatGPT	Do you know ChatGPT?
User Proximity to ChatGPT	Have you used ChatGPT to help complete a task? How often do you use ChatGPT in a week?
ChatGPT roles for users	What types of tasks do you most often complete using ChatGPT?
Effectiveness of ChatGPT	How effective do you think using ChatGPT is in completing the task? What are the main benefits that you get by using ChatGPT in completing tasks?
ChatGPT usage quality	So far, has the use of ChatGPT affected the quality of the work you produce? What do you think about using ChatGPT as a tool to complete tasks?
Response to the use of ChatGPT	Have you ever experienced problems using ChatGPT to complete tasks? If yes, please explain briefly. Do you have any additional suggestions or input regarding ChatGPT in completing tasks?

The purpose of this research is to find out the effectiveness of using ChatGPT in completing assignments in astronomy lectures conducted at Muhammadiyah University of Maumere. In the study, there were 20 students as samples; these students were 4th-semester students who took the astronomy course during the current semester, namely in the even semester. In lectures that are applied to students, the ChatGPT contribution has been made in solving problems related to lecture topics. So, it is considered necessary to know

how much the ChatGPT contribution is to completing assignments carried out by students. To find out this, several activities are carried out so that the goal can run optimally. Before data collection begins, students are informed regarding the research being carried out. It is intended that students have the choice of being involved in filling out a questionnaire about the effects of using ChatGPT or not. The flow of the research experimental design scheme is presented in Figure 1.

**Figure 1.** Research scheme

III. RESULTS AND DISCUSSION

Students are designed in the same group, where all students as a research sample are given the same task to complete. As many as 20 students studied, they knew and had used ChatGPT to help them easily complete college assignments. The number of students studied consisted of male and female students. This can be seen in Table 2.

Table 2. Gender descriptive research sample

Gender	Total	Percentage (%)
Male	4	20
Female	16	80

Of all the students who were tested, they had the same response regarding their insights about ChatGPT; 20 students claimed to know ChatGPT. Student answers can be seen in Figure 2.

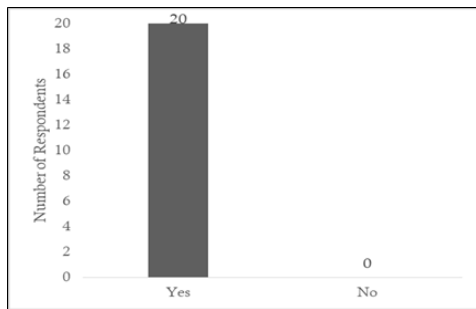


Figure 2. Number of students know ChatGPT

In addition, students admit that using ChatGPT is a solution for them to complete assignments given by lecturers. The resulting graph is the same as shown in Figure 1, showing that 20 students have a 100% Yes answer if using ChatGPT is an alternative to completing their assignments. This has been explained in research Haleem et al. (2022), namely that the use of ChatGPT can be used to

solve problems in education such as completing assignments, writing stories, essays, and others. Another support from research Qi et al. (2023) explains that not only doing assignments like writing essays in other ways but also using ChatGPT can be done to translate languages and answer questions.

Meanwhile, the question of how often students use ChatGPT to complete assignments has an amazing answer. This can be seen in Figure 3.

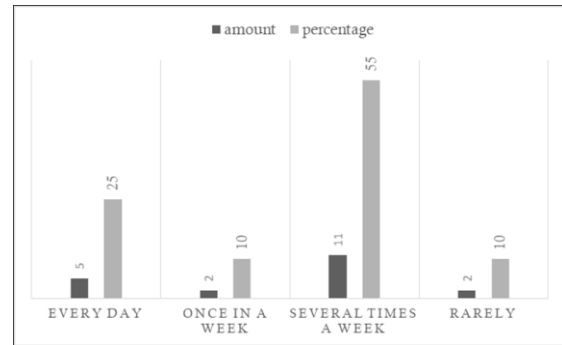


Figure 3. Number and percentage of student ChatGPT usage

Figure 3, shows that students use ChatGPT more often. This can be seen if the use of ChatGPT every day has some respondents as high as 25%, while for several times a week with a percentage of respondents of 55%, the rest are 10% once a week and 10% on rare answers. The results of this response show that ChatGPT involvement is capable of being implemented in the world of education (Su & Yang, 2023). The needs of today's students force them to solve the problems they face in a fast-paced way. The emergence of ChatGPT as part of AI products answers this challenge (Sweeney, 2023). This is why, in the

current era, this kind of application is much favored by students.

Indicators of the role of ChatGPT for users with questions on the questionnaire,

namely what types of tasks you often complete using ChatGPT, have uniform answers. This is shown in Figure 4.

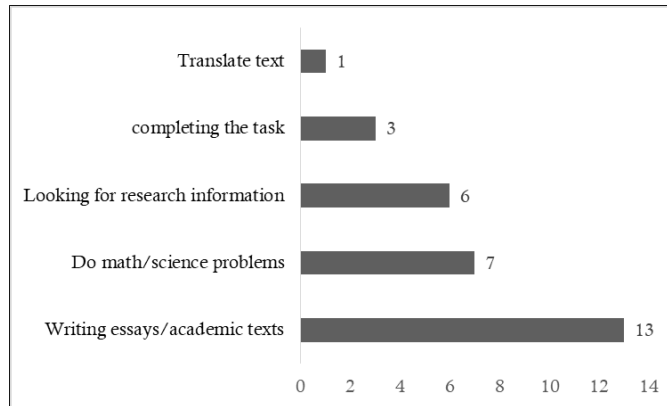


Figure 4. Types of tasks most frequently completed using ChatGPT

In connection with research [Ali et al. \(2023\)](#), it can illustrate the clarity of the research data in Figure 4. Previous research has said that writing essays using ChatGPT is very popular. This activity takes place because the products created by AI have a human-like [\(Alser & Waisberg, 2023\)](#).

How effective the use of ChatGPT is in completing student assignments is important to know in this research. So that the questions in the questionnaire included how effective the use of ChatGPT was in completing assignments to be answered by students. The results obtained from these questions can be seen in Figure 5.

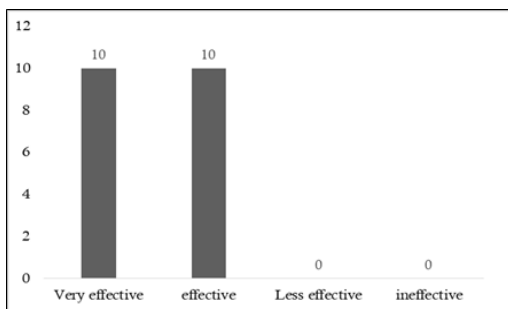


Figure 5. Effectiveness of using ChatGPT

Figure 5 shows that ChatGPT users in this study recognize this product for solving the educational problems they face. This is in line with research conducted [Lim et al. \(2023\)](#), namely that products from AI appear to be transformative innovations in the field of education. This is effective if used as an innovative problem solver in the field of education. According to research data, 10 students considered this product to be very effective, and 10 others chose it to be effective.

For the percentage value from Figure 5, it has value, namely that 50% of respondents said that using ChatGPT to complete tasks was very effective, while those who answered were as effective as 50%. From the results obtained, ChatGPT itself can be used as a reference for students to complete tasks using the platform provided in the application [\(Alafnan et al., 2023\)](#).

In addition, the use of ChatGPT has benefits for students' involvement in learning.

The student responses to the benefits generated can be seen in Table 3.

Table 3. Frequency of students answers

Question	Answer	Fre
What are the main benefits that you get by using ChatGPT in completing tasks?	Ease in generating text/tasks	13
	Broaden my understanding of certain topics	3
	Helped me overcome the difficulty of the task	2
	Can save time	2
So far, has the use of ChatGPT affected the quality of the work you produce?	Improving the quality of tasks	20
	Does not affect the quality of the task.	0
	Degrades the quality of work	0
What do you think about using ChatGPT as a tool to complete tasks?	Very supportive, and I will continue to use it.	13
	Support, but I'll only use it occasionally.	5
	Neutral; I don't have a strong preference	2
	Not very supportive, I prefer to complete the task myself without the help of ChatGPT.	0
	I am not in favor; I find the use of ChatGPT inappropriate in the context of a task.	0

Based on Table 3, ChatGPT has good benefits in the world of education; namely, 13 (65%) students answered that using ChatGPT makes it easy to produce texts or assignments, while 3 (15%) students consider it to broaden their understanding of certain topics, but in overcoming difficulties with tasks and saving time by 2 (10%). Reviewing the magnitude of the benefits that ChatGPT provides to education, especially in terms of completing assignments, ChatGPT is considered capable of building a learning environment that supports current technological developments (Eager & Brunton, 2023).

In this study, the authors found that artificial intelligence, namely ChatGPT, has many advantages. One of them is the ability to produce human-like text, speed up the writing process, and provide fast and accurate solutions to certain problems (Misnawati,

2023). So, what makes ChatGPT so effective is that it helps in decision-making and increases the efficiency of human difficulties. ChatGPT can also save humans time in doing college assignments, reduce costs, and increase consisten.

ChatGPT is highly recommended for use in the world of education, especially in universities. However, something must still be taken into account, namely ethical awareness in plagiarizing, which must still be filtered so that there is always a learning concept in it.

IV. CONCLUSION AND SUGGESTION

ChatGPT has made significant contributions to advances in search, discovery, reference services, and information. ChatGPT has the potential to continue changing these fields in the future. The advantages of using artificial intelligence technology include the ability to make

decisions quickly and accurately based on data. So this awareness must be built from an early age if the presence of ChatGPT is a solution that must be maintained by students in solving problems. Of course, the problem is resolved by upholding moral values in its use, namely still prioritizing ethics not to simply draw conclusions based on the answers presented by the application.

This type of activity is considered to have excellent benefits for the completion of tasks in education. ChatGPT is very well used to complete tasks with a voter frequency of 13 students, or about 65% of the number of respondents. In addition, the use of ChatGPT is also considered effective for completing tasks on astronomy lessons, with a percentage of 50% of students who claim to use ChatGPT to complete astronomy lectures at Muhammadiyah University of Maumere choosing very effective answers and another 50% choosing an effective answer. Thus, the opportunities for innovation using ChatGPT telecommunications are wide open to education in Indonesia and the use of ChatGPT at Muhammadiyah University of Maumere College.

The weakness in this research is the small number of respondents as a research sample which is based on statistical data that is not accurate enough to be used as a global reference for research, but can still be used as primary reference data for students, lecturers and subsequent research. As a suggestion for further research that wants to conduct similar research, it should be carried out on more respondents with more renewable variations.

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