Comparing the Use of AI Tools in Mathematics and English Education: The Potential and Challenges of AI as Learning Assistant for FKIP Universitas Qomaruddin Students in Completing Academic Tasks

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Received: 29 April 2024

Accepted: 2 July 2024

Published: 7 July 2024

Citation: Wardani, H.K., Mazidah, E.N., & Hidayah B. (2024). Comparing the Use of AI Tools in Mathematics and English Education: The Potential and Challenges of AI as Learning Assistant for FKIP Universitas Qomaruddin Students in Completing Academic Tasks. *Qomaruna Journal of Multidisciplinary Studies*, 1(2), 10-24

ABSTRACT

This study investigates the utilization of Artificial Intelligence (AI) among students enrolled in Mathematics and English Language Education programs at higher education in completing their academic tasks. Through a qualitative method, the study examines students' attitudes towards AI, their preferred AI tools, and the perceived benefits and challenges associated with AI integration in academic tasks. The findings reveal that the majority of students in both programs view AI as a valuable tool for enhancing learning outcomes and academic performance. Chat GPT emerges as the most favoured AI tool, particularly among Mathematics students. Moreover, students acknowledge the potential of AI to improve their motivation in learning and provide personalized feedback. However, students also express concerns regarding AI's limitations, including its inaccuracy and potential biases in data and information. Overall, this study underscores the importance of integrating AI responsibly and equitably to optimize its benefits and address potential drawbacks.

Keywords: *Artificial Intelligences; AI tools; learning assistant; academic tasks; higher education students.*

ABSTRAK

Penelitian ini menyelidiki pemanfaatan Kecerdasan Buatan (Artificial Intelligence/AI) di kalangan mahasiswa yang terdaftar dalam program Pendidikan Matematika dan Bahasa Inggris di perguruan tinggi dalam menyelesaikan tugas akademik mereka. Melalui metode kualitatif, penelitian ini mengkaji sikap mahasiswa terhadap AI, alat AI pilihan mereka, serta manfaat dan tantangan yang dirasakan terkait integrasi AI dalam tugas akademik. Temuan menunjukkan bahwa sebagian besar mahasiswa dalam kedua program tersebut melihat AI sebagai alat berharga untuk meningkatkan hasil belajar dan kinerja akademik. Chat GPT muncul sebagai alat AI yang paling disukai, terutama di antara mahasiswa Matematika. Selain itu, mahasiswa mengakui potensi AI untuk meningkatkan motivasi belajar mereka dan memberikan umpan balik yang dipersonalisasi. Namun, mahasiswa juga menyatakan kekhawatiran terkait keterbatasan AI, termasuk ketidakakuratan dan potensi bias dalam data dan informasi. Secara keseluruhan, penelitian ini

menekankan pentingnya mengintegrasikan AI secara bertanggung jawab dan adil untuk mengoptimalkan manfaatnya dan mengatasi potensi masalah.

Kata kunci: Kecerdasan Buatan; aplikasi AI; bantuan belajar; tugas akademik; mahasiswa perguruan tinggi

1. Introduction

Currently, education in Indonesia cannot be separated from Information Technology. With time, the advancement of information and communication (ICT) supports the transformation of learning from conventional education to electronic learning, better known as e-learning, by providing various web-based platforms (Supangat et al., 2021). Through these platforms, students can search for information and interact with other students. Hence, E-learning has become a new approach in education that has emerged from the technological era and offers alternative educational approaches.

The use of e-learning in education has developed rapidly since the COVID-19 pandemic spread worldwide in late 2019. This outbreak forced all educational institutions worldwide, including Indonesia, to shift from face-to-face learning to online learning at the beginning of 2020 to minimize the impact of the pandemic on students and teachers. However, this also positively impacted teachers' adaptation to online learning and challenged them to find innovations in implementing teaching methods through various online platforms (Wardani & Zakiah, 2021). Many countries, including Indonesia, have adopted a combination of offline and online learning in schools and universities to stop the spread of the virus while ensuring that learning continues (Jamaluddin et al., 2023). Since then, online learning platforms have flourished, even though some educational practitioners have already been using e-learning as a support tool before the pandemic. Nevertheless, E-learning is now used not only as a support but also as the main means to ensure optimal material delivery to students.

The utilization of e-learning in the field of education cannot be separated from the development of Artificial Intelligence (AI). With advancements in technology, AI has become a catalyst for educational transformation. AI is a technology that enables machines such as computers to perform tasks that traditionally require human intelligence by learning from data, recognizing patterns, and making decisions based on human commands (Fadilla et al., 2023). AI is designed to assist human activities by employing human-like thinking capabilities and is characterized by its swift and accurate decision-making and task performance to enhance effectiveness and efficiency in daily life (Kurniawan, 2023). Moreover, AI demonstrates capabilities that surpass human abilities, particularly in speed and accuracy, with the future potential to outstrip current human capacities or even surpass human speed, and undoubtedly, the accuracy of AI in running a program is superior to humans (Haris & Tantimin, 2022). Therefore, the importance of Artificial Intelligence cannot be overlooked, as it enables us to make more informative and intelligent decisions by its ability to process data quickly and accurately for daily needs. AI has emerged as a powerful driving force in transforming various aspects of human life, as almost every sector, including education, has utilized this technology.

In the context of education, AI has opened new opportunities to enhance learning experiences (Ilham et al., 2024). The integration of AI in education has substantial potential to improve the quality of learning, enhance the development of education (Fitria, 2023), and offer innovative possibilities for supporting and maximizing its benefits in learning (Karataş et al., 2024). This signifies a notable transformation in education by providing various AI tools to improve students' language skills and assist teachers in organizing their teaching resources (Floris, 2023; Floris et al., 2024). These statements emphasize the emergence of AI in classrooms to support the learning process through various adaptive tools, such as smart tutoring systems that tailor materials to student needs, chatbots to answer student questions, automatic evaluation systems, and other AI-based learning tools that facilitate interactive and personalized learning. Thus, AI is the key to developing a future of relevant and adaptive education that can meet the demands of the technology era and bring significant benefits to students (Liriwati, 2023).

The swift development of AI not only represents a significant change in education, but also underscores its pivotal role in enhancing student learning outcomes by facilitating personalized learning resources. Therefore, students are among the groups most affected by the rapid growth of AI in education, particularly students at higher education levels. In recent years, higher education students have increasingly begun to leverage the functions of AI to support their academic activities, such as completing assignments, searching for information, and finding materials (Salsabilla et al., 2023). Some AI tools, such as machine learning and chatbots, significantly impact the development and growth of higher education (Gayathri & Bella, 2020). Consequently, the advent of artificial intelligence in higher education has brought both opportunities and challenges.

However, these challenges require further investigation. Discussing the role of artificial intelligence in the education sector, which is becoming more widespread, may not be complete without addressing questions about whether AI can be a friend or a foe. Although human life has benefited from AI, it can also have negative impacts. Since AI can influence human life, it is crucial to maintain the security and privacy of data and ensure that the use of AI does not violate human rights (Cahyono et al., 2023), especially the rights of students.

Students of the Faculty for Teacher Training and Education (Fakultas Keguruan dan Ilmu Pendidikan/FKIP) at the University of Qomaruddin (UQ) are also one of the groups affected by the rapid growth of AI. As faculty members of FKIP UQ, researchers have witnessed how students today rely on AI tools such as Chat GPT, Perplexity, and Quilbot. Therefore, the researchers are interested in conducting a study that is intended to explore how the students of FKIP Universitas Qomaruddin, particularly those from the Mathematics Education Study Program and the English Language Study Program, utilize AI to complete their academic tasks.

This study was based on previous studies by Subiyantoro (2023) and Utami et al. (2023). The earlier study, "The Impact of Artificial Intelligence (AI) on English Language Teaching in Higher Education: Opportunities and Challenges," focused on the AI tools utilized by 16 English lecturers from public and private universities in central Java as the study subjects. Meanwhile, the latter study entitled 'Utilization of Artificial Intelligence Technology in an Academic Writing Class: How do Indonesian Students Perceive?' focused on the AI-assisted tools utilized by English Department students to complete Academic Writing tasks. However, this study differs from the two prior studies. The novelty of this study lies in its subjects. The first study chose English lecturers as participants, while the second study focused on English department students. In contrast, this study selected students from two departments in the Faculty for Teacher Training and Education (FKIP) Universitas Qomaruddin, namely the Mathematics Education Study Program and the English Language Study Program. Additionally, the main discussion of this study is the comparison of the AI tools utilized by Mathematics and English Department students, which also became a novelty of this study.

Hence, this study aims to explore how higher education students at FKIP Universitas Qomaruddin perceive the potential and challenges of AI as a learning assistant in completing their academic tasks. The results of this study are expected to increase higher education students' awareness of the potential and challenges of AI tools in their academic performance. This study is also expected to benefit lecturers by providing insights that enable them to adjust teaching strategies and guide students, as they utilize AI-assisted tools and navigate AI-driven learning environments.

2. Method

This study employed a qualitative descriptive method. Qualitative research requires a natural setting that involves some efforts to understand the attitudes, perspectives, feelings, and behaviors of both individuals and groups of people as the subjects of the study (Moloeng, 2017). In this study, the subjects were chosen using purposive sampling based on the purpose of the study, which was to find out AI-assisted tools utilized by the students, their reasons for utilizing the tools, and their feelings about them. A purposive sample is typically used based on the belief that participants possess pertinent information relevant to the study (Ary et al., 2010).

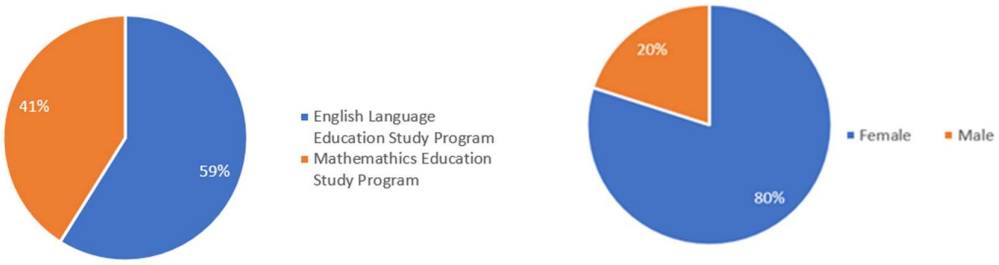

Figure 1. The demographic data of the subjects of the study: (a) Study Program; (b) Gender

Figure 1 shows the demographic data of the participants. Ninety-five students from two departments within the FKIP UQ participated in this study, comprising 39 (41%) Mathematics Education students and 56 (59%) English Language Education students, with 19 (20%) males and 76 (80%) females. Their ages ranged from 18 to 23 years old. They were given questionnaires through Google Forms to answer questions related to the utilization of AI for their assistance in completing their academic tasks. A questionnaire is a data collection technique commonly used in qualitative methods that provides certain written questions or statements to be answered by respondents (Sugiyono, 2017). Questionnaires are deemed effective for collecting data as long as the researchers possess a clear understanding of the variables to be measured and have precise expectations from the respondents (Pratama & Hastuti, 2024). The questionnaire comprised a series of questions aimed at comparing the utilization of various AI tools as learning aids among students, examining their influence on academic achievement, and exploring the impact of AI tools on their learning outcomes. In addition, the questionnaire sought to identify the potential challenges of AI in students' academic endeavors and their perspectives on its implications for learning.

3. Results and Discussion

The questionnaire was distributed to students through Google Forms on November 16. The researchers waited for the students to respond to the questionnaire until March 16, before compiling the results. The results of the questionnaire are described below.

The most frequently used AI tools for facilitating students in completing assignments

In the first question, students were asked whether they often utilized AI in their academic assignments. The results of the students' answers to the first question can be seen in the charts below.

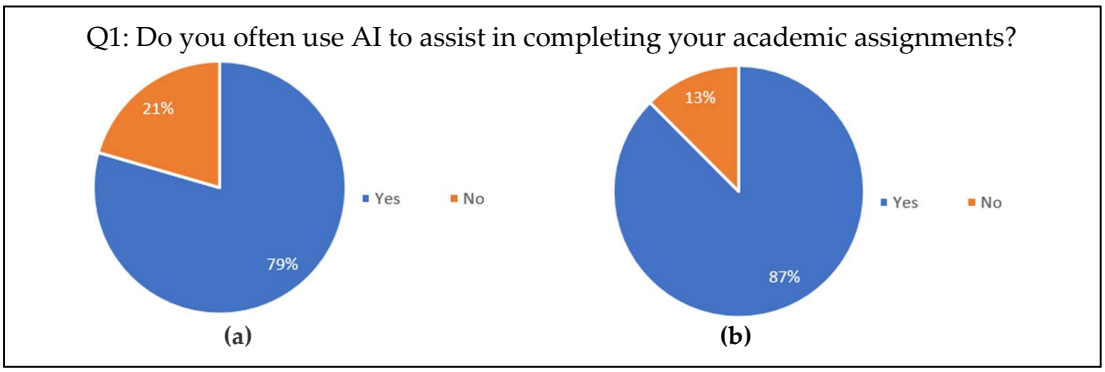

Figure 2. The number of students using AI in academic assignments: (a) Mathematics Education Study Program; (b) English Language Education Study Program

The two charts above illustrate the utilization of AI by students to complete their academic assignments. Figure 2a presents data from Mathematics Education students, indicating that out of 39

respondents, 31 (79.5%) admitted to often utilizing AI for their assignments, while only eight (20.5%) stated that they never used AI for academic tasks. Figure 2b displays information from English Language Education students, where 49 out of 56 students (87.5%) confessed to frequently using AI for assignment completion, while only 7 students (12.5%) reported never using AI for this purpose. These findings underscore the significant reliance on AI tools among students for academic tasks, particularly in English Language Education.

Based on the description provided, it can be inferred that the majority of students enrolled in the FKIP UQ have derived benefits from AI in fulfilling their academic tasks. These findings align with a prior study by Salasabilla et al. (2023), which noted that, in recent years, students in higher education institutions have progressively utilized Artificial Intelligence technology to aid various academic activities, including assignment completion, information retrieval, and resource identification. These findings highlight the growing integration of AI technology in academic settings and its increasingly significant role in supporting student learning and academic endeavors.

In the second question, students were asked to list the AI tools they often used to assist them in completing their academic assignments (see Figure 3).

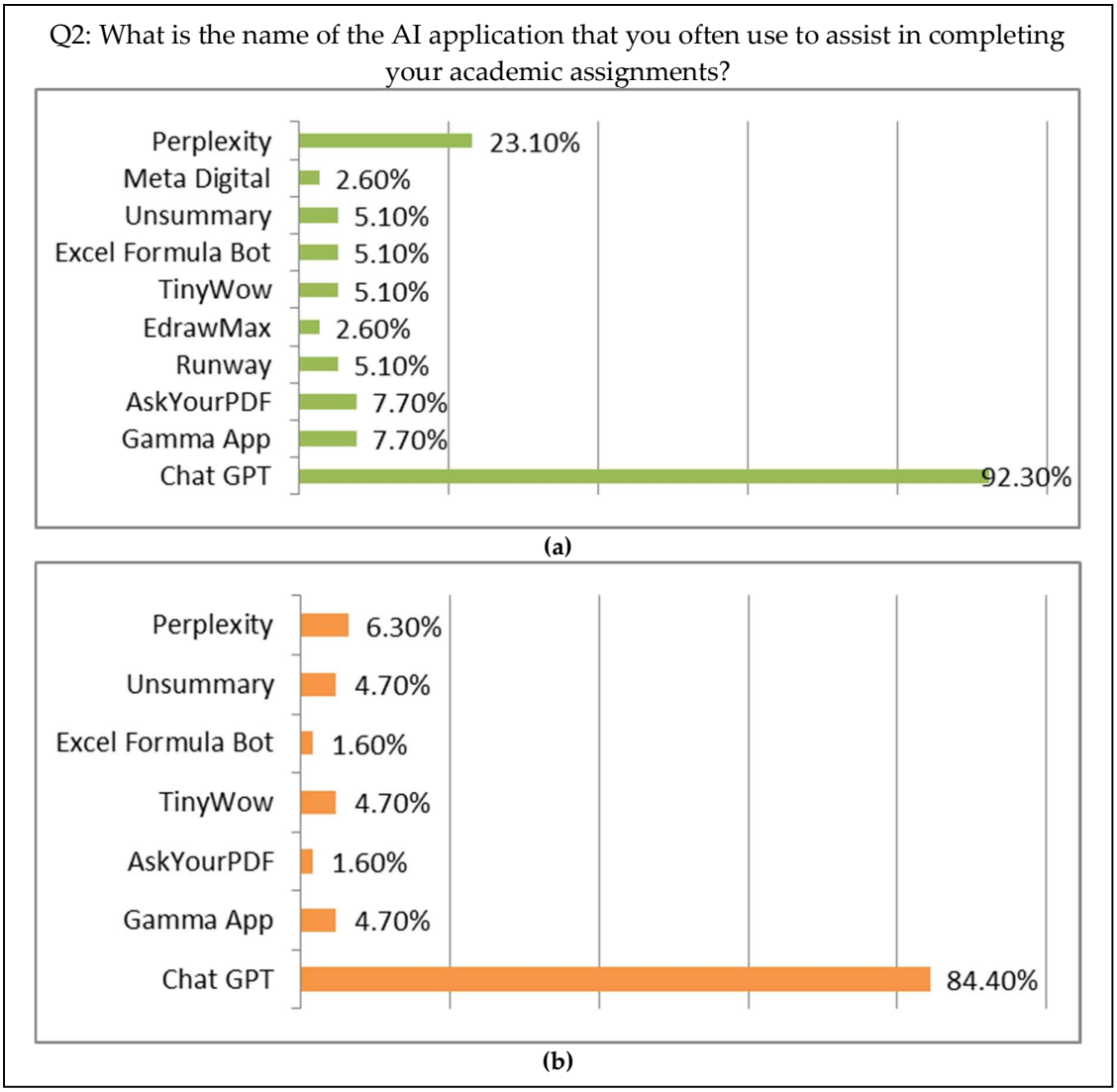

Figure 3. AI tools utilized by students in completing academic assignments: (a) Mathematics Education Study Program; (b) English Language Education Study Program

Figure 3 illustrates the widespread popularity of the Chat GPT among students. The Chat GPT emerged as the preferred AI tool for assignment assistance in both study programs. Approximately 92% of mathematics students and 84% of English Language Department students expressed a preference for the Chat GPT. Perplexity emerged as the second most popular AI tool, with 23.1% of mathematics students and 6.3% of English Language Education students choosing it. The subsequent rankings showed slight variations in the students' preferences for AI tools. In Mathematics, Gamma App and AskYourPDF secured the third position at 7.7%, while Unsummary, Excel Formula Bot, TinyWow, and Runway followed in the fourth position at 5.1%. Meanwhile, Meta-Digital and EdrawMax were the least favored AI tools among mathematics students, with only 2.6% relying on them. Conversely, among the English Department students, Unsummary, TinyWow, and Gamma App occupied the third spot at 4.7%, while Excel Formula Bot and AskYour PDF were the least preferred, chosen by only 1.6%. These insights underscore the diverse preferences and utilization patterns of AI tools among students in the different study programs. In addition, the varied preferences for AI tools among students highlights the need for tailored technological solutions to cater to the diverse needs and preferences of learners in academic settings.

Based on the description provided above, it can be concluded that the Chat GPT is the most favored AI tool utilized by both Mathematics and English Language Education students. This preference is likely attributable to its ease of access and prompt feedback. These findings align with a prior study by Karatas et al. (2024), which suggested that the instantaneous feedback provided by the Chat GPT has the potential to enhance student motivation and engagement. Additionally, Chat GPT serves as a valuable source of information for students to cultivate and develop ideas more effectively by offering students an alternative search engine with overwhelming results (Hung & Chen, 2023; B. Liu, 2023; Niu et al., 2022; Pratama & Hastuti, 2024). In conclusion, the widespread preference for Chat GPT among students underscores its significant role in facilitating learning and providing valuable support for academic endeavors. This situation aligns with the evolving landscape of educational technology and increasing reliance on AI tools for enhanced learning experiences.

The third question was about the specific AI tools used by Mathematics and English Language Education students in learning their academic assignments. The students were asked to list specific AI tools in their learning fields. The list of AI tools mentioned by the students is shown in the following figure 4.

Figure 4(a) illustrates that Mathway stands out as the most preferred AI tool among mathematics students, with approximately 71.8% of students choosing it. Following Mathway, Geogebra, Photomath, and Wolfram Alpha Examples are popular choices for mathematics assistance. Notably, Microsoft Math Solver emerged as the least favored option, utilized by only 2.6% of students. Conversely, Figure 4(b) highlights Google Translate as the top choice among English Language students, with 71.9% of students selecting it. DeepL Translate, Quilbot, and Paraphraser also enjoy significant use among students, aiming to enhance their English skills. However, ELSA trails behind as the least preferred tool, utilized by only 1.6% of the students. These preferences indicate the diverse ways in which students use AI tools to support their learning journeys.

The varied preferences shown in the figures underscore the importance of AI tools in aiding students across different academic disciplines. While Mathway dominates the realm of mathematics assistance, Google Translate has emerged as the frontrunner for enhancing English language proficiency. These findings reflect the evolving landscape of educational technology and the diverse needs of students to leverage AI tools to enrich their learning experiences.

In conclusion, these findings reveal a significant reliance on AI among students from both Mathematics and English Language Education programs, with a notable proportion frequently utilizing AI to complete assignments. Students' preferences for AI tools varied, including platforms such as Chat GPT, Mathway, and Google Translate (GT). These findings underscore the growing integration of AI into educational practices by offering students versatile resources to enhance their learning and productivity. However, it is crucial for educators and institutions to foster a balanced approach to AI utilization by leveraging its benefits while addressing potential concerns to ensure meaningful integration into the educational landscape.

Figure 4 Specific AI tools utilized by students to support their learning in their fields: (a) Mathematics Education Study Program; (b) English Language Education Study Program

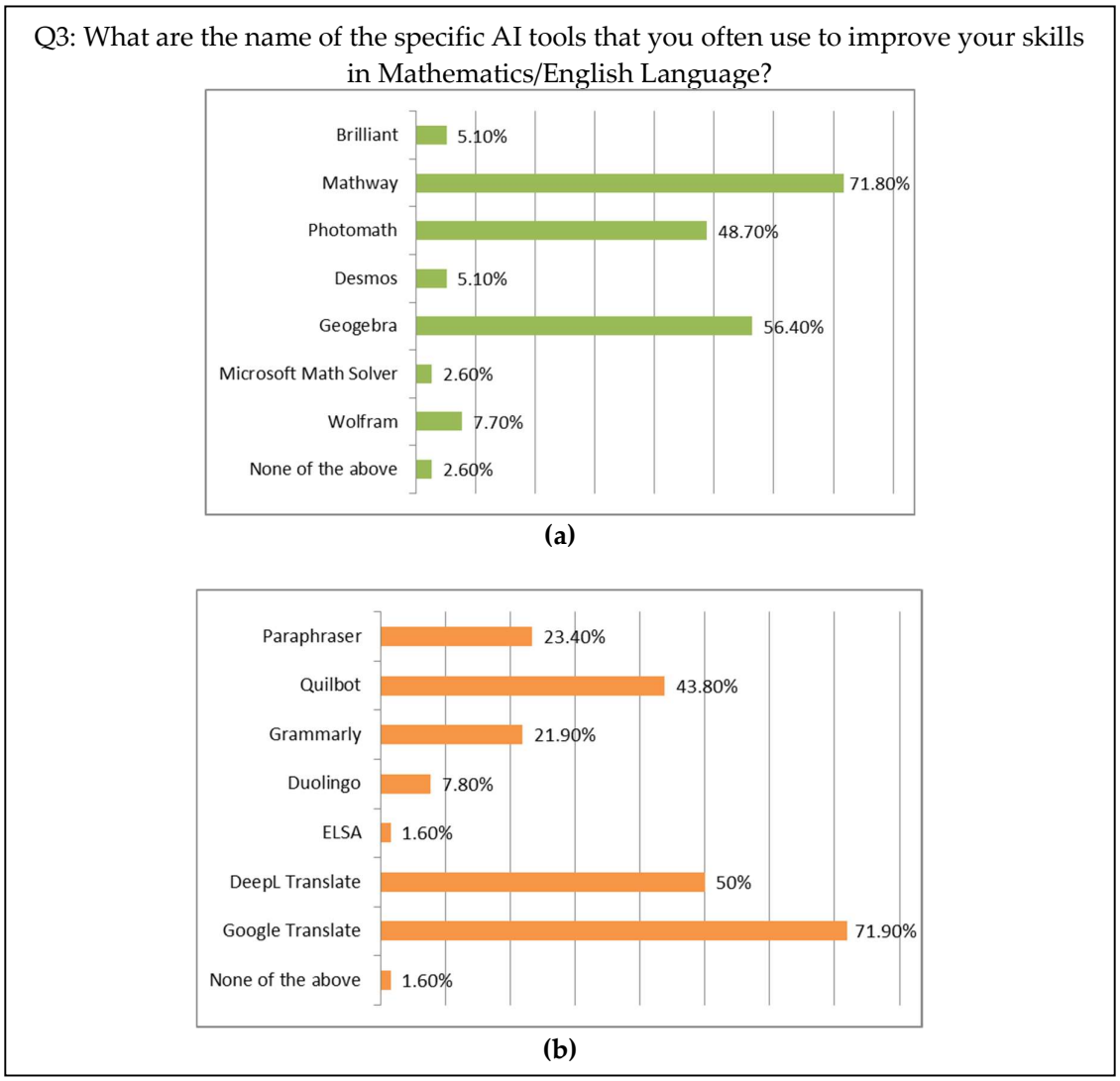

Figure 4 Specific AI tools utilized by students to support their learning in their fields: (a) Mathematics Education Study Program; (b) English Language Education Study Program

The significance of AI tools for facilitating students in learning achievements

In the fourth question, the students were asked whether the AI tools they utilized truly helped them complete their academic assignments. Their responses are presented in the figure below.

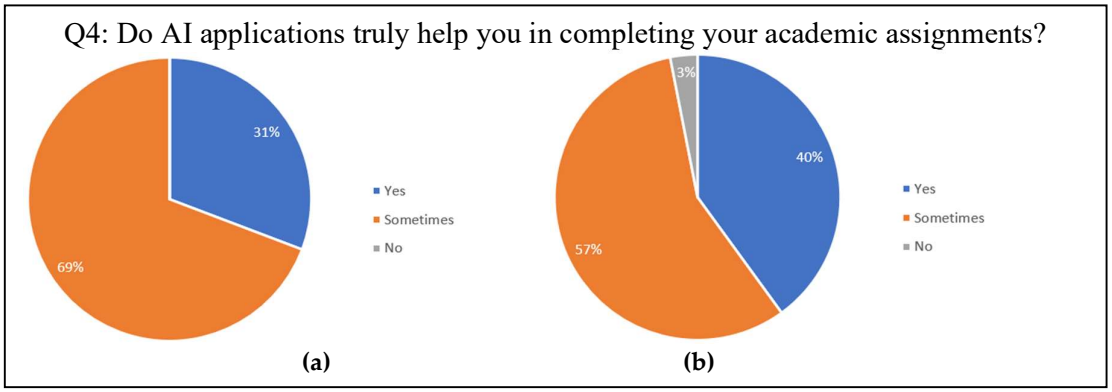

Figure 5 The impacts of utilizing AI tools in their learning achievement: (a) Mathematics Education Study Program; (b) English Language Education Study Program

Figure 5 illustrates students' perspectives regarding the helpfulness of AI tools in completing their assignments. Among Mathematics students, a small percentage (3.8%) strongly believed in the effectiveness of AI tools, while the majority (69.2%) expressed mixed feelings, acknowledging that AI can be helpful at times, but not always reliable. Similarly, among the English Department students, a significant portion (41%) firmly believed in the efficacy of AI tools, with only a minor fraction (2%) expressing skepticism. However, the majority (57%) held ambivalent views, recognizing the potential benefits of AI while acknowledging its limitations. These findings highlight the nuanced attitudes of students towards the role of AI in academic tasks, reflecting the need for further exploration and understanding of its impact on learning outcomes.

In the fifth question, the students were asked to list the benefits of AI in learning and completing assignments. Students' answers are shown in the following figures.

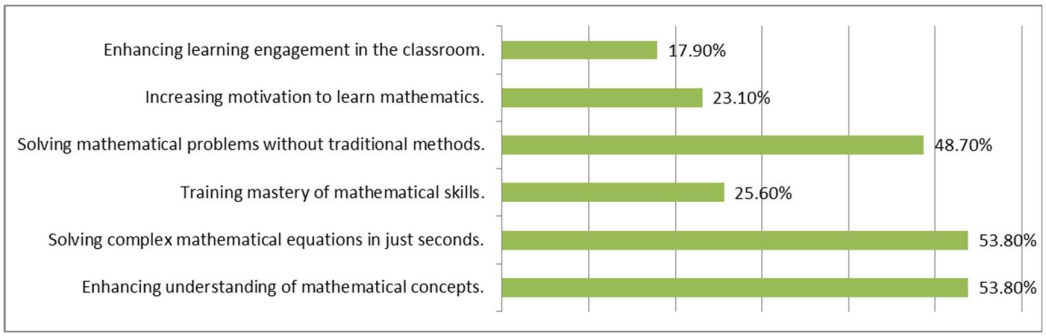

Figure 6 Benefits of AI for Mathematics Students

Figure 6 presents the perspectives of mathematics students regarding the benefits of AI in their academic achievements. The majority of students (53.8%) expressed optimism about the role of AI in solving complex mathematical equations and improving their understanding of mathematical concepts. Additionally, 48.7% believed that AI facilitated problem solving in mathematics without relying on traditional methods. Moreover, 25.6% acknowledged AI's potential to enhance their mastery of mathematical skills, while 23.1% cited the increased motivation to learn mathematics as a benefit of AI. Finally, 17.9% of students believed that AI could enhance their engagement in the classroom. These findings underscore the diverse ways in which students perceive AI as a valuable tool for academic success and highlight its potential to support learning outcomes in mathematics.

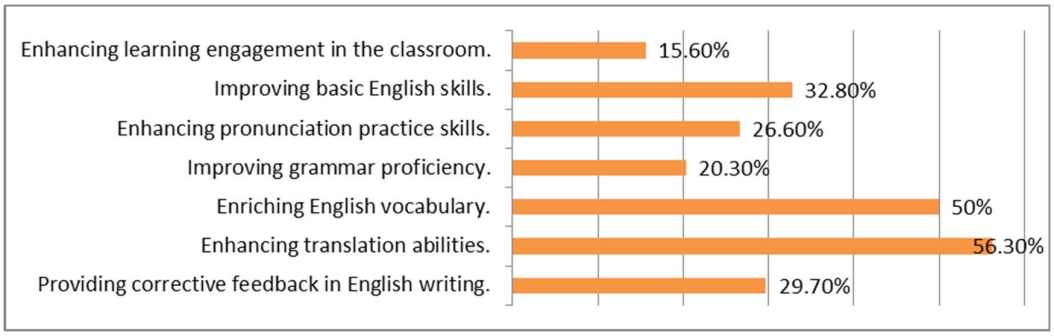

Figure 7 Benefits of AI for English Language Education Students

Figure 7 illustrates the perceptions of English Language Education students regarding the benefits of AI in their academic performance. The majority of the students (56.3%) expressed the belief that AI could enhance their translation abilities, while half of the students (50%) saw AI as a tool for enriching their vocabulary. Additionally, 32.8% of students acknowledged AI's role in improving their Basic English skills (Listening, Speaking, Reading, and Writing), while 29.7% cited its ability to provide corrective feedback for their writing. Furthermore, 26.6% of the students mentioned AI's assistance in pronunciation practice, 20.3% highlighted its contribution to grammar proficiency, and 15.6% believed that AI could enhance classroom engagement. These insights underscore the multifaceted benefits of AI in supporting English language learning outcomes and offering students various avenues for academic improvement and skill development.

The findings indicate a favorable disposition among students towards the role of AI in augmenting their learning experiences. It underscores AI's capacity to swiftly and precisely process data, empower students to make informed decisions, and explore novel avenues for academic enrichment. Additionally, AI's capacity of AI to offer tailored feedback contributes to a deeper understanding of student progress, thereby fostering heightened interest and engagement in the learning process (Ilham et al. 2024; Ronsumbre et al. 2023). These insights underscore the potential of AI to revolutionize education by catering to individual learning needs and enhancing the overall learning outcomes.

The Potentials and Challenges of AI in facilitating students' learning achievements

In the last two questions (questions 6 and 7), the students were asked to list the potential and challenges of AI for their learning achievements. The results of the students' answers to the last two questions are presented in the following tables.

Table 1. Students' perspectives about the Potentials of AI in their academic achievements

No	The Potentials of AI in Education	Mathematic Students	English language Students
1	AI creates opportunities for students to acquire limitless knowledge.	48.7%	34.4%
2	AI is highly beneficial in teaching and learning.	48.7%	53.1%
3	AI assists in overcoming students' learning difficulties.	69.2%	48.4%
4	With AI, students can access a more diverse, adaptive, and up-to-date range of references.	2.6%	6.2%
5	AI facilitates students in honing their skills and exploring career opportunities.	-	3.1%
6	Students can access AI anytime, allowing for more flexible learning.	15.4%	7.8%

The data in Table 1 highlight several key perceptions among students regarding the potential of AI in education. First, a significant proportion of both Mathematics and English Education students acknowledge AI's role of AI in expanding their knowledge base. Additionally, a considerable

percentage of students from both disciplines recognized the value of AI in teaching and learning processes. Moreover, the majority of mathematics students, as well as a substantial portion of English Language students, perceive AI as a tool to overcome learning challenges. Furthermore, a small but notable percentage of students from both groups appreciated AI's role of AI in providing access to diverse and up-to-date learning resources. Additionally, a fraction of English Language students acknowledges AI's role of AI in skill development and career exploration. Finally, a noteworthy proportion of mathematics students, along with a smaller percentage of English Language students, value the flexibility that AI offers in learning environments. These findings highlight the multifaceted contribution of AI to education. This indicates AI's potential of AI to significantly enhance instruction and foster adaptive learning, ultimately leading to improved educational outcomes (Zekaj, 2023).

Table 2. Students' perspectives about the Challenges of AI in their academic achievements

No	The challenges of AI in education	Mathematics Student	English language Students
1	AI will replace the roles of teachers and lecturers in education.	15.4%	3.1%
2	AI undermines students' confidence in their abilities.	51.3%	34.4%
3	AI kills students' creativity.	43.6%	31.3%
4	AI creates dependency that hinders their ability to develop their skills.	23.1%	26.6%
5	AI can make students reluctant to consult with their teachers which can lead to diminished communication between teachers and students.	2.6%	3.1%
6	Not all students have equal access to technology, which can create disparities in learning experiences.	2.6%	3.1%
7	Sometimes the results obtained from AI may be less accurate.	-	3.1%
8	Some students may need a longer time to adapt before using AI.	2.6%	3.1%
9	Sometimes AI exhibits bias in providing data or information.	-	1.6%
10	AI requires digital literacy skills.	23.1%	15.6%

Table 2 presents the various challenges perceived by the students regarding the integration of AI into education. First, a notable percentage of mathematics students, along with a smaller fraction of English Education students, expressed concerns about AI potentially replacing the roles of teachers and lecturers, indicating apprehension regarding the future of human educators in the digital age. Moreover, a significant proportion of students from both disciplines identified a challenge related to AI undermining their confidence in their abilities, suggesting a psychological impact on their self-efficacy. Additionally, a considerable percentage of mathematics students, as well as a notable portion of English Language students, highlight concerns about AI-stifling students' creativity, indicating potential drawbacks to relying heavily on AI-driven learning methods. Furthermore, a substantial fraction of students from both groups expressed concerns about AI fostering dependency, which could impede their skill development and self-reliance. Other identified challenges include disparities in technology access among students, potential inaccuracies in AI-generated results, the need for adaptation time, and the possibility of AI exhibiting bias in data provision. Finally, a significant proportion of mathematics students, along with a smaller percentage of English Language students, recognize the importance of digital literacy skills in effectively utilizing AI. These findings underscore the complexity of integrating AI into education and highlight the need to address various challenges to ensure equitable and effective implementation.

The findings from Tables 1 and 2 underscore the multifaceted nature of students' perceptions of the integration of AI into education. While students recognize the potential benefits of AI in enhancing learning experiences and addressing educational challenges, they also express concerns about its implications, including its potential impacts on teacher roles, student confidence, creativity, and dependency. These findings verify the conclusions drawn from previous studies. Most students exhibit favorable attitudes toward utilizing AI-powered tools, particularly acknowledging their utility and ease of use (Moulieswaran and Kumar 2023). However, it is evident that students require additional support to bolster their digital literacy skills, enabling them to harness the full potential of AI effectively (Utami et al., 2023). Interestingly, students' apprehensions regarding AI's capacity to supplement human teachers contrasts with the findings of Fitria (2023), who underscored the indispensable role of human educators in guiding and nurturing students, a sentiment echoed by the broader educational community. Despite its benefits, AI also presents inherent challenges, including its inability to entirely replace human educators, absence of personalized teaching methods, and technical constraints and safety concerns (. Liu, 2023).

Furthermore, analogous instances were observed among Chinese university students. These two factions express contrasting perspectives. The conservative factions expressed concern regarding the utilization of ChatGPT by students for the purpose of engaging in academic dishonesty. Nevertheless, several Chinese educators advocate the integration of AI-powered technology into academic learning, as they argue that AI-enabled writing tools can enhance the caliber of academic output. Chinese educators are currently highly concerned about students committing plagiarism, which is considered a form of academic dishonesty(Hung & Chen, 2023; Liu, 2023; Niu et al., 2022). The situation in both Indonesia and China highlights the necessity for deeper comprehension and sagacity regarding the functioning of AI, encompassing its advantageous and detrimental consequences. Thus, AI in education requires comprehensive strategies that prioritize digital literacy, equitable access to technology, and the thoughtful integration of AI tools into pedagogical practices.

In the final questionnaire, students were allowed to write their personal opinions regarding the existence of AI in their daily lives. Table 3 shows the personal opinions of the students. It can be concluded that students have a nuanced perspective on the presence of AI in education. While acknowledging its potential to greatly facilitate learning processes and improve educational quality through personalized learning, lifelong learning flexibility, AI tutoring, and administrative task automation, students also expressed concerns. They highlighted the importance of using AI wisely, understanding its limitations, and avoiding overreliance. Although AI can be immensely beneficial, it may also lead to dependency, hinder critical thinking, and diminish confidence in one's abilities. Hence, students emphasize the necessity of striking a balance and integrating AI effectively, while continuing to prioritize active learning, creativity, and independent thinking in education.

Table 3. Students' personal opinions regarding the existence of AI

No	Mathematic Student	English language education Students
1	AI certainly has beneficial impacts, especially among students, serving as a reference, among other things. However, there are still negative impacts if we become too dependent on AI for completing tasks, leading to a lack of confidence in our abilities and reliance on AI.	AI indeed aids the learning process, but it doesn't mean we should fully rely on its results. We need to adapt to the advancements and pay attention to its fundamental aspects, such as understanding its processes before trusting its outcomes. This way, we won't be trapped by overly instantaneous thinking."
2	AI is not entirely negative. There are positive aspects for students as well as drawbacks. On the positive side, it can assist students with various challenges in this technological era. However, on the downside, students may become overly reliant on using AI.	AI greatly assists in completing tasks, and the data/answers obtained are more accurate and based on factual data. However, the presence of AI sometimes leads me to underestimate tasks and lose the ability to be creative on my own.

Table 3 (Continued). Students' personal opinions regarding the existence of AI

No	Mathematic Student	English language education Students
3	AI provides benefits to students facing difficulties. However, when students become addicted to continuously using AI, they may end up overly dependent. This could potentially make students a minority in literacy culture, and their brains may cease to work altogether due to reliance on AI.	AI greatly aids in English language learning, but some AI responses are less relevant and need to be corrected. Moreover, excessive reliance on AI can lead to technological dependency and stifle creativity.
4	AI is highly needed in today's era. It can assist in completing tasks for students and even teachers. However, what we need to be wary of is the emergence of dependency on AI, which can affect learning activities, whether it's a lack of understanding among students or a decline in communication between students and teachers.	The presence of AI technology is a breakthrough in the field of educational technology to facilitate learning. Wise and controlled use of technology can accelerate education. The emergence of Artificial Intelligence (AI) technology can also instill independence in learners.
5	AI has been very helpful in my tasks. However, I am starting to realize that I have become too reliant on AI, which has made me lose confidence in my abilities. In addition, there is a concern that students may simply transfer answers from AI without understanding the material.	AI can assist and simplify our tasks/work, but it also has negative impacts, so it's best to use it within reasonable limits because not all answers from AI are 100% correct. Therefore, we need to continue learning and rely more on our abilities.
6	"AI is quite effective, but it does not guarantee that answers are always correct. Sometimes, users need to review and manage the results.	AI is beneficial for supporting and facilitating student learning, but sometimes it makes students lazy to think and opt for the easy way out by relying on AI. So, AI should be used in moderation.
7	AI can be utilized to cultivate sophisticated and relevant thinking patterns.	"AI is the best invention of the present era because it simplifies many things."
8	AI can create dependency in individuals, but on the other hand, it is highly beneficial and assists greatly in solving problems.	AI greatly facilitates activities, especially for students, but it can also lead us astray if we do not use it wisely and properly.
9	AI greatly facilitates its users, but it can also make them lose confidence in their abilities."	AI can be a highly beneficial tool for humanity if we can adapt and use it wisely."
10	AI has been very beneficial for me; I have often used it to find solutions to problems, especially in mathematics."	AI can be used for both positive and negative purposes, so when using AI, we should aim to extract its benefits.
11	AI is artificial intelligence that can be regulated within a scientific context.	"AI helps you, but it can also harm you."
12	AI is very useful for me. However, it can create dependency and diminish my confidence in answering without relying on AI.	"AI is one of the means to make learning easier but not all data generated by AI is correct. Therefore, we must understand it beforehand."
13	"I am greatly assisted by the presence of AI. However, it should also be integrated well and efficiently. So that we as students do not lose our creativity to develop our potential."	AI is very helpful., but relying on its use can diminish one's interest in literacy. This is especially true for students who tend to simply copy without reading first.
14	AI is very helpful, but sometimes the answers are not accurate.	AI makes people with broad knowledge seem less impressive.
15	AI is very helpful, although sometimes the answers may not fully align with what is desired.	AI can be quite helpful, but we shouldn't rely on it entirely because not all results are accurate."
16	"AI plays a crucial role in the era of globalization, particularly in the field of education. It can assist educators and learners in enhancing the quality of education."	"AI has sparked a transformation in the world of education. Through personalized learning, lifelong learning flexibility, AI tutors, and administrative task automation, AI opens up significant opportunities to enhance the quality of education."

The students' perspective regarding the Existence of AI, especially its potential and challenges, as stated in Tables 1, 2, and 3, supports the results of previous research by Subiyantoro et al. (2022). Their research highlighted that the integration of Artificial Intelligence (AI) into teaching at universities in Indonesia creates both opportunities and challenges. AI is highly beneficial in both learning and teaching. The continuous emergence of AI applications presents opportunities for educators and students to access limitless knowledge and instant solutions for learning difficulties. However, along with the myriad opportunities presented by AI in education, educators face challenges in the future. One such challenge is the potential replacement of teachers and professors with AI, as the millennial generation is adept and tech-savvy in operating AI.

4. Conclusion

In conclusion, the findings from both mathematics and English language education study programs underscore the widespread utilization of AI tools among students to enhance their academic endeavors. Both groups of students demonstrated a positive attitude towards leveraging AI technologies, recognizing their utility in facilitating learning tasks, and improving educational outcomes. However, there were notable differences in the specific AI tools preferred by the students from each program. For instance, Mathematics Education students predominantly favor tools such as Mathway and Geogebra for solving mathematical problems, while English Language Education students rely heavily on Google Translate and DeepL Translate to enhance their language skills. Despite these variations, it is evident that AI plays a crucial role in supporting student learning in diverse academic disciplines. As technology continues to evolve, fostering digital literacy and providing appropriate support mechanisms will be essential for ensuring that students can effectively harness the benefits of AI while navigating its associated challenges.

Several strategies are recommended for practical implications for educators. First, integrating AI in the classroom is significant for building students' awareness of AI literacy and helping them improve their academic performance. Second, promoting the balanced use of AI to students by not only providing them with access to diverse AI tools for their specific academic needs, but also encouraging them to be aware of the ethical considerations of AI. Third, utilizing AI to assess students' performance can be considered to improve their learning outcomes and emphasize that AI is not infallible. In assessing their academic tasks, it is crucial to communicate to students that, while AI tools can be valuable resources, they are not always dependable because AI is just a complementary tool, not the only solution to develop their academic achievements. Overall, despite its significance in integrating AI in the classroom, both educators and students must remain vigilant and aware of the potential risks associated with AI tools (Law, 2024).

Finally, it is important to acknowledge that this study had some limitations and areas for improvement. One such area is the need to explore the scope of checking the originality and accuracy of products using AI-based learning tools, which could provide valuable insights for future researchers. Additionally, expanding the participant pool to include students from diverse universities and colleges could enrich the findings and offer a broader perspective on this topic. Furthermore, future research endeavors could consider employing semi-structured interviews alongside questionnaires to delve deeper into the participants' experiences and perspectives. By continuously striving to enhance the methodology and scope of research, it is expected that more educators will contribute to a more comprehensive understanding of the role of AI in education and pave the way for further advancements in educational development.

Acknowledgment

We would like to extend our sincere gratitude to the students who participated in this study for completing the questionnaires. Your valuable contributions have been instrumental in enriching our understanding of AI utilization of Artificial Intelligence among students in Mathematics and English Language Education programs. We truly appreciate your time, effort, and willingness to share your insights, which have contributed significantly to the advancement of knowledge in this field.

Declaration of Conflict of Interest

The authors declare no potential conflicts of interest related to the research, writing, and/or publication of this article.

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