



INTERNATIONAL JOURNAL OF
MODERN EDUCATION
(IJMOE)
www.ijmoe.com



" THE IMPACT OF CHATGPT ON STUDENT LEARNING IN PRIVATE HIGHER LEARNING INSTITUTION"

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Article Info:

Article history:

Received date: 27.10.2024

Revised date: 11.11.2024

Accepted date: 15.12.2024

Published date: 24.12.2024

To cite this document:

Narayanasamy. P., Mazlan. W. S, & Ariffin, M. K. (2024). "The Impact of ChatGPT On Student Learning in Private Higher Learning Institution". *International Journal of Modern Education*, 6 (23), 643-656.

DOI: 10.35631/IJMOE.623044

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Abstract:

The integration of ChatGPT into the education system has introduced transformative changes, offering both substantial benefits and notable challenges. This abstract addresses the impacts of ChatGPT focusing on teaching and learning providing educational inequalities among students enrolled in higher education at a private higher education institution. ChatGPT is designed to significantly enriches educational practices by delivering personalized learning experiences. Its ability to provide real-time, adaptive feedback allows students to engage with content at their own pace, catering to diverse learning styles and needs. Moreover, ChatGPT facilitates access to information and educational resources. It acts as an on-demand tutor, helping students with homework, clarifying complex concepts, and offering practice problems across various subjects. This increased accessibility in education by providing high-quality support in teaching and learning. However, the integration of ChatGPT into education also presents challenges. Issues of data privacy, the risk of perpetuating biases, and the need for accurate content verification are among the significant concerns. Additionally, reliance on Artificial Technologies (AI) for learning support raises questions about the potential reduction in human interaction, communication and the implications for developing critical thinking and problem-solving skills. The results of this study show that ChatGPT has significant negative impacts to the educational teaching and learning outcomes. This study also crucially addresses the challenges and impacts of using ChatGPT in collaboration, communication, critical thinking and problem-solving skills among students at private higher education level. However, a cross-sectional study comparing respondents from

public higher education opinions of ChatGPT are required to undertake a more thorough investigation.

Keywords:

Artificial Intelligence Technologies, Impact of AI, ChatGPT, Pre-U Students Perspective, Teaching, Learning.

Introduction

In this 21st century, technology has become an important tool in the ever-evolving educational environment. The use of technology in education has become more rampant which was also due to triggered by the pandemic COVID-19 in the year 2020. The COVID-19 pandemic has caused many higher educational institutions to revise their educational practices, placing the emphasis on digital transformation and technological innovation (Chi & Cai, 2024). In addition, the use of innovative technologies which includes software, ICT and social media, additive, mobile learning systems or applications, digital and artificial intelligence (AI), and others is to has modernise the traditional educational setting and to be broken through barriers in the classroom (Chi & Cai, 2024). As such, artificial intelligence (AI) has become a significant transformative force which offers various innovative solutions to improve teaching and learning. One important AI tool that has taken the education industry by storm is ChatGPT. ChatGPT provides a unique learning method which can supplement the traditional learning method by offering personalised assistance, instant feedback and an assorted collection of learning materials.

According to Smith & Jones (2024c) the incorporation of ChatGPT in the educational environment can provide on-going support to learners beyond classroom settings, catering to different individuals learning paces and styles. This is because ChatGPT can provide explanations to various queries and facilitate interactive learning to enhance students' learning experiences. Although students really benefit from using Chat GPT, there are concerns about how this AI technology may affect student learning outcomes when it is used in the classroom. The important aspect could be the effect on student engagement, student's ability in problem solving and critical thinking skills.

Thus, this research aims to investigate the impact of ChatGPT on students learning in higher education. By obtaining feedback from students, this study intends to identify whether the use of ChatGPT has impacted students in a positive or negative manner. It is hoped that this research would provide a valuable insight into the role of AI in shaping the future of education. The research questions addressed are:

1. Does ChatGPT improve collaboration and communication skills amongst students in private higher learning institutions in Malaysia?
2. Does ChatGPT improve critical thinking skills and problem-solving skills amongst students in private higher learning institutions in Malaysia?
3. What are the perceived challenges encountered by using ChatGPT amongst students in private higher learning institutions in Malaysia?

The first part of the paper introduces the use of ChatGPT amongst learners. The paper's second part covers the literature review on artificial intelligence ChatGPT and the methodology which describes data collection. This is followed by the findings and discussions. The final section summarizes the conclusion, limitations of the study and future research direction.

Literature Review

ChatGPT Application in Education

The introduction of Artificial Intelligence (AI) such as ChatGPT has led to a huge transformation to the teaching and learning in the education system. Since its appearance in the education line, it does not only help the educators to provide an alternative form of interactive learning and developing content for syllabus but it is also supporting the students to have a new learning experience (Smith & Jones, 2024b). For instance, the ChatGPT was designed with the ability to provide a quick explanation and at the same time to answer real time questions promptly to help and support individuals in learning by creating a better understanding (Doe, 2024c). Students were able to use ChatGPT to obtain feedback for a better understanding when the questions are tailored specifically for certain subject, area or task (Johnson, 2024b). However, there must be an appropriate supervision towards students when using the AI in education as it may raise concerns about data privacy and the reliability of information and its accuracy (Brown, 2024c). As many educational institutions begin to adopt AI applications, it is important and crucial to maintain an ongoing monitoring and evaluation on AI technologies in order to create a situation where the potential of these AIs is maximised. The rapid use of AI technologies such as ChatGPT in the educational system provide a better alternative innovative tool for teaching and learning and thus, would contribute a potential positive educational practice reshaping (Green, 2024d).

Positive Impacts of ChatGPT

The developing AI technologies implemented in the education system has given so much positive impact to both teaching and learning environment. ChatGPT especially has led to a significant impact providing an almost accurate specialised feedback which leads to an individualised pathways of learning experience (Smith & Jones, 2024e). The concept which has the ability to filled up the gap and produce explanations to clarify concepts that give understanding for various subject matter has given a diverse learning experience in classrooms (Doe, 2024a). Moreover, the used of ChatGPT has produced an opportunity for the educators to create a better teaching material for an interactive learning in classroom at the same time helping them with the automated grading system for student's assessments (Johnson, 2024a). AI technologies such as ChatGPT has also created various types of resources aids to enhance student's problem-solving skills and self-directed learning activities (Brown, 2024d). The ability of AI technologies such as ChatGPT which can be used at any remote area or even for a hybrid mode has made teaching and learning a lot easier regardless of any location area (Green, 2024e). Overall, ChatGPT's contributions to education represent a promising advancement, helping to create more equitable and effective learning environments while complementing traditional educational methods.

Negative Impacts of ChatGPT

Although the used of AI technologies such as ChatGPT has given tremendous positive impacts to the teaching and learning in the education system, there are also negative impacts that has to be considered and consideration. One of the obvious negative impact towards students when

using the AI technologies such as ChatGPT is the over reliant towards the tools which leads to the declining of the ability for critical thinking and problem-solving skills independently. (Doe, 2024b). Furthermore, relying too much on the AI tools such as ChatGPT can lead a student to a superficial understanding of a certain subject since the information provided on the searched subject matter might lack depth (Smith & Jones, 2024a). In addition, there were other negative impact such as leakage of security and data privacy of students' information through using AI technologies such as ChatGPT which can lead to criminal cases (Johnson, 2024c). Other than that, the feedback generated by the AI tools such as ChatGPT can also affect the quality of teaching and learning when the information provided are biased, misleading and inaccurate (Brown, 2024b). Finally, ChatGPT can also generate an inequality in teaching and learning for its inaccurate suggestions or feedback towards certain task questions and answers which potentially creating confusion between educators and students (Green, 2024a). Addressing these challenges requires a balanced approach to integrating AI in education, ensuring AI technologies to be seamlessly adapted into the learning processes.

Collaboration and Communication using ChatGPT

Collaboration and communication have been significantly transformed by the advent of AI tools like ChatGPT. The use of ChatGPT has the ability to enhance the facilitation of teamwork to provide great insightful findings and real time support for all users (OpenAI, 2024b). For an example, the AI tools such as ChatGPT can create collaborations between educators and students in providing instance feedback, streamlining all documents and generating creative ideas to enhance teaching and learning in classrooms (Smith & Jones, 2024d). Moreover, the use of ChatGPT can create a better collaboration between educators and students for its ability to provide human like text that allows better communication between team members without having to be at the same location (Doe, 2024d). Furthermore, the use of ChatGPT has created a collaborative platform for many educators and students to interact and expand communication which also helps to mitigate misunderstanding of concepts and creating a proper teaching and learning space (Williams, 2024). As AI technology continues to evolve, its role in enhancing collaboration and communication is likely to expand, offering even more sophisticated tools for members to harness in their collaborative efforts.

Critical Thinking And Problem Solving Using ChatGPT

Critical thinking and problem-solving skills are increasingly enhanced by AI tools like ChatGPT, which offer valuable support in analysing complex issues and generating solutions. Recent studies have proved that the use of ChatGPT in education system has tremendously increase the critical thinking skills which helps to promote systematic problem analysis (Johnson & Lee, 2024). This application not only promote the problem-solving skills but also enhance the decision-making process among educators and students in teaching and learning system (Smith, 2024d). Moreover, the ability of ChatGPT to provide prompt feedback and responses encourages educators and students to provide various strategies and solutions for different environment mode of studies (Brown, 2024a). By using the AI tools such as ChatGPT, educators and students were able to tackle complex challenges and promote critical thinking skills more effectively. However, it is important to clarify ChatGPT information and solutions with the human judgment to make sure that feedbacks and information are reliable and appropriate with situation (Green, 2024c). As AI continues to evolve, its role in fostering critical thinking and problem-solving skills is expected to become even more integral to effective decision-making and strategic planning.

Challenges using ChatGPT

Despite its advancements, ChatGPT faces several significant challenges that impact its effectiveness and reliability. The use of AI technologies such as ChatGPT can create a major issue of misleading, misused and inaccurate information which could lead to an academic misconduct in assessments submission (Open AI, 2024a). Moreover, when using the information provided by ChatGPT, it is important to monitor that the information, data or feedback is not outdated and biased (Doe & Smith, 2024). Furthermore, it is also important to look into ethical issues related to information from ChatGPT as there could be breach of data privacy and sensitive information to prevent its misuse in areas related to not only education system but also religion, race and culture (Jones, 2024). Other than that, the use of ChatGPT to obtain useful information could also lead to misunderstanding due to misleading information. This issue creates concerns between fairness and inclusivity (Brown, 2024e). On the other hand, to use AI technologies such as ChatGPT would require one to have financial sustainability as it will need to come with a package of computational resources and internet support (Green, 2024b). Addressing these challenges requires ongoing research and development to improve the accuracy, fairness, and security of AI systems, thus, ensuring they can be used responsibly and effectively in various applications.

Theoretical Framework

Applying Constructive Learning Theory to AI Tools

Constructive Learning theory is primarily based on the works of Piaget (1972) and Vygotsky (1978). This theory proposes that learners build their own understanding and knowledge of the world through their experiences and their reflection on those experiences. (Rasul, 2023) According to Qureshi (2021), constructivist theory influences modern learning and teaching processes. This theory emphasizes active, experiential learning where learners engage with tasks that are meaningful and contextually relevant. With advancements in artificial intelligence (AI), it becomes increasingly possible to implement this learning theory into educational technologies. AI tools, which can personalize learning, provide scaffolding, facilitate collaboration, and enable reflection, align well with the principles of constructive learning theory.

Constructivist Theory and ChatGPT

The constructivist learning theory can be applied when discussing the impact of using ChatGPT in higher learning institutions.

Active Learning And Engagement

The constructivist learning theory highlights the importance of learners actively participating in acquiring new knowledge and moving beyond passive reception of information (Piaget, 1980; Schunk, 2012). Furthermore, ChatGPT can facilitate active engagement through interactive platforms. In assisting learners to create new knowledge, ChatGPT can scaffold their past experiences and knowledge. Besides, ChatGPT's customised feedback can assist learners in this process by expanding on their past understanding and experiences and offering tailored recommendations for more learning (Ippolito *et al.*, 2022; Vygotsky, 1962).

Authentic Assessments

Constructivist philosophy focuses on the value of authentic assessment, which evaluates students' capacity to apply their knowledge and skills in practical settings (Rasul, 2023;

Wiggins 1990). Additionally, integrating ChatGPT into the assessment will provide learners the opportunity to scaffold their knowledge actively.

Adaptive Learning

According to Schunk (2012), learning is created based on knowledge acquired in the past. ChatGPT can provide personalized scaffolding by adjusting the complexity of tasks based on learner performance.

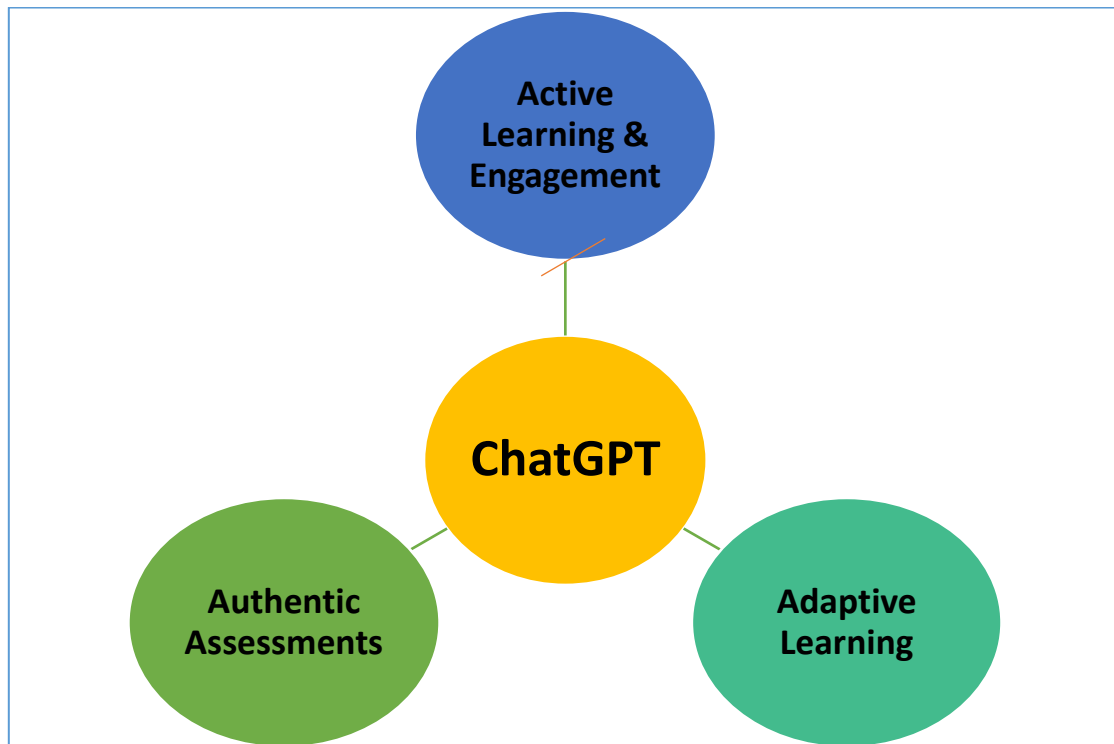


Figure 1: Connection between Active Learning, Authentic Assessment, Adaptive Learning and ChatGPT Feedback

The diagram above visualises the connection between active learning and engagement, authentic assessment, adaptive learning and ChatGPT. According to Figure 1 of the model, each component interacts with ChatGPT to form a dynamic learning system.

Methodology

This is a case study research which focuses on students enrolled in higher education at a private higher education institution in Klang Valley, Malaysia. The research employs the constructivist theory of learning to investigate the impact of ChatGPT on students learning in private higher education institution. Most of the respondents bring their own devices to their classrooms which becomes more convenient for the students to use ChatGPT in their learning process.

Since the use of ChatGPT is inevitable amongst students these days, it is necessary to gain students feedback on their perception of this technology. The research questions were designed based on the objective of understanding how students enrolled in pre-university studies felt about using ChatGPT in their learning environment. The first research question was designed to obtain feedback on the collaboration and communication of using the ChatGPT whether the

use of ChatGPT has positively impacted the students learning. This led to the second research question which analyses students on critical thinking upon using ChatGPT. The last research question was to gather information on challenges encountered by students with the use of ChatGPT in their learning.

Data Collection

The participants in this study were selected based on how well they match the parameters of the research questions and objectives, with a total sample size of 110 students. The sample of 110 respondents consist of students from various different background both International and Malaysian students. These students are mostly from various pre-university programmes and enrolled in many different subjects such as Mathematics, Economics, Accounting and others. To protect the respondent's privacy, their identity was kept confidential.

Data was collected using Google Forms, focusing on open-ended questions. This suggests the study is more exploratory and qualitative in nature rather than relying on quantitative statistical methods. While the paper discusses findings related to collaboration, communication, critical thinking, and the challenges of using ChatGPT, there is no mention of statistical techniques such as hypothesis testing, regression analysis, or significance testing. The results are presented in a descriptive manner, without employing any statistical tests to validate the findings or establish correlations between variables. The study which includes 110 respondents, is suitable for a qualitative approach. However, without detailed statistical analyses like factor analysis or correlations, the conclusions drawn are primarily based on subjective data interpretation rather than rigorous statistical evaluation. Part A of the questionnaire was to collect demographic characteristics of the respondents such as age, nationality and their subjects enrolled. Whereas Part B of the questionnaire was to gather information on how ChatGPT has impacted their collaboration and communication skills. Besides, the questionnaire was also designed to obtain information on the challenges of using ChatGPT as a learning tool. The link for the survey was given to the respondents during class time and they were given about 10-15 minutes to complete the form. The table below consist of sample questions which were developed to collect information from students.

Table 1: Sample of Open-Ended Questions for Data Collection

No.	Sample of open-ended questions
1.	Do you think ChatGPT have influenced your collaboration skills in group discussions? If yes, how?
2.	Do you think ChatGPT have influenced your communication skills in group discussions? If yes, how?
3.	Have you encountered any challenges or limitations while using ChatGPT for learning? If so, please describe.

Demographic Information

The following table displays the demographic data of the students sorted by nationality based on the obtained data:

Table 2: Demographic Data Of Students

Gender		Nationality		Age	
Male	53%	International	21%	17 years	15%
				18 years	25%
Female	47%	Malaysian	79%	19 years	46%
				20 years	9%
				21 years and above	5%

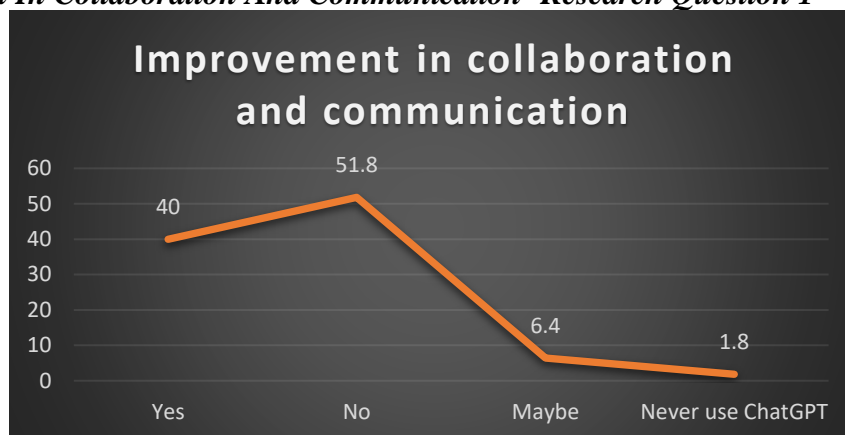
The survey carried out showed that 53% of the respondents were males and 47% were females. In terms of nationality, 21% were international students while a majority of the students were Malaysians (47%). The age group of the respondents ranged from 17 years to 21 years whereby 15% were 17 years, 25% were 18 years, 46% were 19 years, 9% were 20 years and 5% of the respondents were 21 years and above. This age group is consistent since the respondents are pre-university students and had either just completed their Sijil Pelajaran Malaysia (SPM) or IGCSE.

The data collected indicated 17% of the respondents were of 17 years of age while 27% of the respondents were 18 years. A majority of the respondents (45%) were 19 years old and a small percentage, which is 7% were 20 years and 4% was 21 years of age.

Findings

In summary, the diagram reinforces constructivist principles by illustrating how productivity and problem-solving skills can be enhanced through active, experiential learning and critical reflection, leading to the development of more effective and versatile thinkers.

The impact of ChatGPT in higher education can be clearly seen based on the discussion above. Nevertheless, there are many challenges encountered by learners when using ChatGPT which has been presented as 3 key areas as follows:

Improvement In Collaboration And Communication -Research Question 1**Figure 2: Relationship Between Gathering And Processing Information**

About 40% of the respondent agreed that using ChatGPT has led to improvement in collaboration and communication which is essential in creating the most innovative and productive teaching and learning environment. This would then lead to a more freely flow of idea, effective communication, enhancement of creativity and a better problem-solving educators and learners. The used of digital tools such as ChatGPT as a managing platform, has helped in streamlining communication, can streamline communication, ensuring everyone stays informed and engaged, regardless of location. The improvement in collaboration and communication, ensuring through the use of ChatGPT reflects students active learning and engagement in class setting.

ChatGPT offers many benefits, however it may not always improve the collaboration and communication in teaching and learning. About 51.8 % of respondents claims that relying too heavily on ChatGPT can lead to a lack of automated response between human and personal connection between educators and learners or within team members. ChatGPT might misinterpret ideas or questions generated causing irrelevant responses and unhelpful information that can cause confusion rather than clarity. Furthermore, AI technologies such as Chat GPT has produced irrelevant suggestions in students learning progress might potentially hinder collaboration and effective communication instead of engaging students in meaningful dialogue within team members.

Improvement In Productivity, Problem Solving And Critical Thinking Skills – Research Question 2

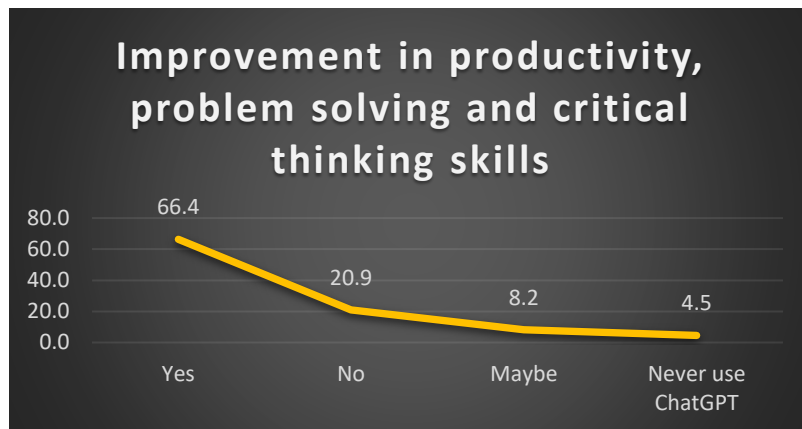


Figure 3: Connection Between Productivity, Problem-Solving And Critical Thinking Skills

Using ChatGPT will provide quick access of information for critical task that are time consuming in teaching and learning. 66.4% of respondents agreed that the used of ChatGPT encourages learners to creatively tackle issues that are complex and give a better perspective of presenting problem-solving of diverse solutions. Additionally, ChatGPT allow respondents to analyse arguments, making assumptions and evaluate various ideas in developing critical thinking learning skills. Overall, integrating ChatGPT creates educational experiences that promote essential skills for a more efficient academic success.

While ChatGPT can be a valuable tool, 33.6% of respondents feedback states that it may not necessarily improve productivity, problem-solving, and critical thinking skills in teaching and learning. Students over-reliance on ChatGPT can lead to their independent learning style, creativity and their ability to tackle complex problems being stifled. Using ChatGPT would also create a superficial engagement for learners where they would rather seek quick response of answers than explore one concept thoroughly. Without proper monitoring or guidance of using ChatGPT, students might end up to not developing contextual understanding, missing the opportunities to collaborate in discussion and provide critical analysis.

Challenges Encountered When Using ChatGPT – Research Question 3

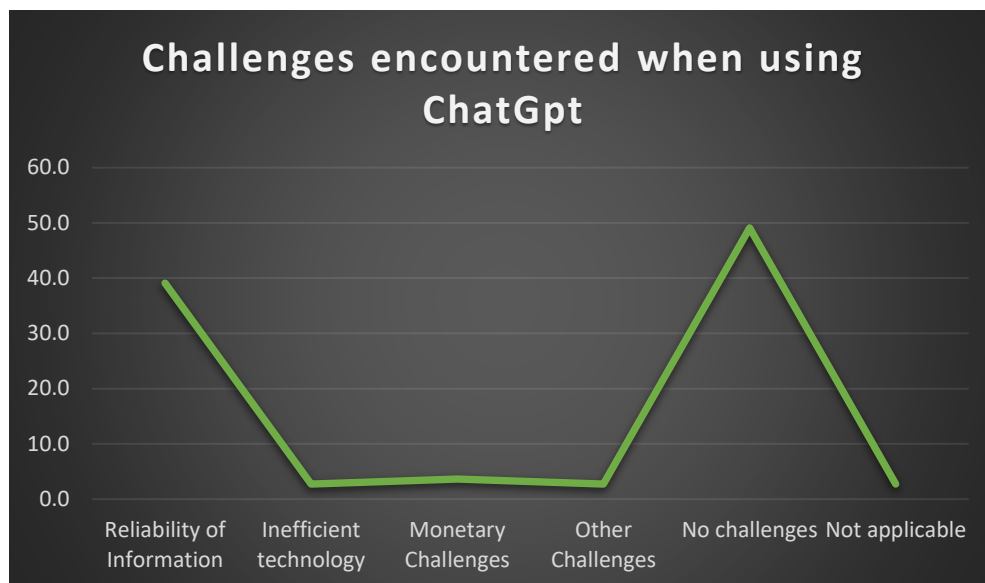


Figure 4: Relationship Between Validity And Reliability Of Information

About 49.1% of respondent stated that using ChatGPT give them no significant challenges. ChatGPT has been a very promising tools that enhance productivity by giving a quick access of ideas and information which allows students to engage with any critical task. Respondents also state that using ChatGPT allow them to have a different learning style and space compared to the old method of learning style using paper and pen. About 39.1% of students feedback given states that ChatGPT give them reliable information that encourages them to learn without disrupting their existing workflow while enhancing them to complete work on time making it a valuable resource for any task given in the classroom or for a group work assessment.

Using ChatGPT can be very useful and reliable to most students. However, about 2.7% of the students stated that using ChatGPT can be inefficient due to its reliance on internet access. 3.6% of students stated that using ChatGPT add to potential subscription costs that pose barriers in learning progress. 2.7% of respondents stated that using ChatGPT would somehow need clarification due to the ChatGPT technology in creating irrelevant responses and occasionally producing inaccurate responses. Overall, a total of 9% of the respondents' feedback agreed that using ChatGPT without proper training can create frustration due to Chat GPT unreliability for education environments and the concerns related to its security and data privacy.

Conclusion

The use of ChatGPT has significantly improved collaboration and communication, as well as enhanced problem-solving and critical thinking abilities. By providing a platform for users to exchange ideas, brainstorm, and engage in discussions, ChatGPT fosters effective communication, leading to better collaboration outcomes. Furthermore, the tool enables users to explore multiple perspectives and approaches to problem-solving, promoting critical thinking and creative solutions.

However, challenges such as monetary barriers, reliability of information, and technical limitations like slow internet or inefficient technology must be addressed. Subscription-based models and inconsistent connectivity can hinder access to these AI benefits, limiting its potential for broader usage. Overcoming these challenges by improving accessibility, ensuring reliable information, and investing in infrastructure will be essential to fully harness the capabilities of ChatGPT and similar AI tools for fostering communication, problem-solving, and critical thinking across diverse sectors.

Limitations and Recommendations

This study was limited to only students enrolled in pre-university studies in one of the private higher learning institutions in Klang Valley. In addition, this study was carried out for only one semester, limiting the sample size due to time constraints. There were some respondents who were reluctant to participate in the survey as they felt that they would be judged for using ChatGPT which contributes to the limited sample size.

In the future, a cross-sectional study comparing respondents' opinions of ChatGPT could be conducted to undertake a more thorough investigation. The study can be expanded to include participants with varying educational backgrounds, such as undergraduates and diploma holders.

Acknowledgements

The authors would like to acknowledge and extend special gratitude to all International and Malaysian Monash University Foundation Year batch of 2024 for the cooperation given to this research. The authors would also like to acknowledge and extended special gratitude to all Monash University Foundation Year lecturers who have helped in sharing the google form of the questionnaires.

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