



Volume 24, 2025

ASSESSING STUDENT READINESS AND PERCEPTIONS OF CHATGPT IN LEARNING: A CASE STUDY IN INDONESIAN HIGHER EDUCATION

Ati Suci Dian Martha*	Software Engineering Study Program, School of Computing, Telkom University, Main Campus (Bandung Campus), Indonesia	aciantha@telkomuniversity.ac.id
Sri Widowati	School of Computing, Telkom University, Main Campus (Bandung Campus), Indonesia	sriwidowati@telkomuniversity.ac.id
Desy Puspa Rahayu	School of Applied Science, Telkom University, Main Campus (Bandung Campus), Indonesia	dpusparahayu@telkomuniversity.ac.id

* Corresponding author

ABSTRACT

Aim/Purpose	This study investigates the readiness of higher education students in Indonesia to use ChatGPT for learning and explores its perceived benefits in academic settings. The research aims to identify challenges and opportunities in integrating generative AI into education.
Background	As a rapidly evolving AI technology, ChatGPT presents both opportunities and challenges in higher education. While it offers convenience and personalized support, concerns regarding ethical use, academic integrity, and student dependency remain. Understanding student readiness and attitudes toward ChatGPT is essential for effective and responsible implementation in learning environments.
Methodology	This study employs a mixed-methods convergent parallel design, collecting both quantitative and qualitative data simultaneously but analyzing them separately. A total of 373 students from diverse universities and disciplines in Indonesia participated. Quantitative data were analyzed using the Rasch measurement model and Winsteps software, while qualitative responses were transcribed and exam-

Accepting Editor Rasika Dayarathna | Received: December 5, 2024 | Revised: March 23, May 27,
June 19, 2025 | Accepted: July 11, 2025.

Cite as: Martha, A. S. D., Widowati, S., & Rahayu, D. P. (2025). Assessing student readiness and perceptions of ChatGPT in learning: A case study in Indonesian higher education. *Journal of Information Technology Education: Research*, 24, Article 23. <https://doi.org/10.28945/5599>

(CC BY-NC 4.0) This article is licensed to you under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/). When you copy and redistribute this paper in full or in part, you need to provide proper attribution to it to ensure that others can later locate this work (and to ensure that others do not accuse you of plagiarism). You may (and we encourage you to) adapt, remix, transform, and build upon the material for any non-commercial purposes. This license does not permit you to use this material for commercial purposes.

ined through summative content analysis using Quirkos 2.5.3 software. Participants were selected through a purposive sampling approach to ensure a representative distribution across institutions and fields of study.

Contribution	This study contributes to the growing discourse on AI in education by offering clear, data-driven insights into Indonesian students' readiness and perceptions of ChatGPT. It reveals that students across diverse regions view ChatGPT as a helpful academic tool, particularly for clarifying complex concepts, reducing stress, and supporting independent learning. These findings provide actionable guidance for educators and policymakers, highlighting the urgent need for AI literacy programs and ethical use policies. The study lays a strong empirical foundation for larger-scale, longitudinal research on AI integration in higher education by presenting these concrete patterns.
Findings	The findings indicate a generally high level of student readiness to use ChatGPT in learning contexts. Students perceive ChatGPT as a valuable tool for completing assignments, clarifying complex concepts, and reducing academic stress. However, concerns were also raised regarding its potential impact on critical thinking skills and the need for clear ethical guidelines. These findings provide preliminary evidence that can support the development of institutional strategies and future research directions.
Recommendations for Practitioners	For educators and institutions, it is crucial to develop structured policies and ethical guidelines for ChatGPT use in academic contexts. Assignments should be designed to promote higher-order thinking skills, such as creativity and problem-solving, rather than mere fact recall. Additionally, AI literacy training should be incorporated into curricula to help students critically evaluate AI-generated content.
Recommendations for Researchers	For researchers, future studies should explore the readiness of educators to integrate ChatGPT into teaching and assess its long-term impact on student learning outcomes, including critical thinking and problem-solving skills. Investigating how ChatGPT can be effectively embedded within existing learning management systems could further enhance its educational potential.
Impact on Society	By identifying both the benefits and challenges of ChatGPT in higher education, this study informs policies and best practices for AI adoption in academia. Addressing issues of digital equity, ethical concerns, and pedagogical strategies can help create a more balanced and effective AI-assisted learning environment, ultimately improving the quality of education and teaching methodologies.
Future Research	Further research should investigate how ChatGPT influences long-term student engagement, skill development, and academic performance. Studies should also examine institutional readiness, faculty perspectives, and AI's role in fostering more interactive and adaptive learning experiences.
Keywords	student readiness, perception, ChatGPT, generative AI, higher education

INTRODUCTION

The release of ChatGPT in November 2022 was a pivotal moment for various industries, including education (OpenAI, 2022). A study conducted by the World Bank Group in March 2024 recorded that 40 Generative AI (GenAI) received nearly 3 billion monthly visits from hundreds of users. ChatGPT was at the top and stood out in this development, capturing 82.5% of the total traffic with more than 2 billion global visits and 500 million users each month (Qiang et al., 2024). Indonesia

ranked 3rd as one of the middle-income countries, showing a high level of GenAI adoption, surpassing high-income countries in ChatGPT traffic (Qiang et al., 2024). This phenomenon raises an important question: Are Indonesians ready to adopt AI? By gaining a deeper understanding of GenAI adoption patterns and their impacts, we can focus on a future where the benefits of AI are accessible to everyone.

ChatGPT is an innovative natural language processing tool that can assist with a wide range of tasks, including writing emails, essays, and coding (Strzelecki, 2024). The use of ChatGPT in higher education presents challenges for the academic community (Teubner et al., 2023). While some academics support ChatGPT, many oppose it due to concerns that it could facilitate cheating or academic misconduct (Strzelecki, 2024). The increasingly intense debate underscores the need to revamp higher education curricula, integrating more critical thinking, ethical perspectives, creativity, problem-solving, and sustainable solutions. This is essential to prepare students for a professional world increasingly influenced by AI (Strzelecki, 2024).

Measuring student readiness and how to utilize ChatGPT in learning is essential for integrating generative AI into higher education. Understanding student readiness and attitudes toward new technologies like ChatGPT can help educators identify barriers to its implementation in learning environments (Chan & Hu, 2023). Additionally, feedback on adapting ChatGPT technology to improve learning outcomes (Strzelecki, 2024; Thong et al., 2023) can be valuable. Educators and policymakers can also address potential digital equity issues and provide guidelines for the responsible and effective use of ChatGPT and other generative AI tools, ultimately enhancing learning experiences in higher education (Strzelecki, 2024) and improving teaching practices (Chan & Hu, 2023).

Previous research by Adams et al. (2024) has measured students' readiness to utilize ChatGPT. In their research, Adams et al. (2024) developed a measuring tool for students' readiness to use ChatGPT for academic purposes in Malaysia's higher education context. It was previously known that Indonesia has the highest ranking in ChatGPT usage traffic. However, research on the readiness to use ChatGPT in Indonesia, especially in the context of learning in higher education in Indonesia, is still minimal. Questions arise about whether these students learn from the process. Do they understand the material or rely on AI as an instant solution? This phenomenon raises fundamental questions about students' readiness to face the AI-based learning revolution in Indonesia. This study utilizes a measuring tool developed by Adams et al. (2024) to measure student readiness in Indonesia's higher education context. The measuring tool is short but relevant to this study because it can measure students' readiness to use ChatGPT for learning activities. In addition, Cronbach's alpha coefficient value of 0.92 indicates that the instrument built by Adams et al. (2024) has perfect internal consistency and is considered reliable. This study provides a different contribution from previous studies, namely, how students' views in Indonesia will influence how ChatGPT is adopted in universities, especially in Indonesia.

This study addresses the research gap by investigating college students' readiness and perceived use of ChatGPT in learning. We investigate factors that promote or inhibit readiness and use by adapting the measurement instrument for readiness and perceived usefulness of ChatGPT, developed by Adams et al. (2024). This study aims to achieve its objectives by answering the following questions:

RQ1: How are college students in Indonesia ready to use ChatGPT as a learning tool?

RQ2: How do college students in Indonesia perceive the usefulness of ChatGPT in learning?

This study focuses on using ChatGPT because, according to Elsenbawy et al. (2025), ChatGPT requires a higher level of education to be understood and has a lower ease of use score than Gemini. Đerić et al. (2024) compared and measured the use of ChatGPT, Copilot, Gemini, and other Generative AI tools across different groups of students (undergraduate, graduate, and doctoral). The study concluded that the most widely accepted and used Generative AI tool is ChatGPT, with undergraduate and doctoral students adopting it at the highest rate. In addition, the tracking of ChatGPT use in Indonesia is very high compared to other tools (Qiang et al., 2024).

We begin the paper by outlining the use of ChatGPT in educational environments and summarizing its advantages and disadvantages. We then explain how we adapted the measurement instrument to measure the readiness and perceived usefulness of ChatGPT among college students. We then present and analyze our results using quantitative and qualitative data. The findings are thoroughly discussed, emphasizing the unique contributions of our study. Finally, we discuss the study's limitations and suggest future research directions.

LITERATURE REVIEW

OPPORTUNITIES IN USING CHATGPT IN EDUCATIONAL ENVIRONMENTS

ChatGPT, an NLP model created by OpenAI (<https://openai.com/>), was released in November 2022. ChatGPT can be used by students and educators in education for various academic and research purposes. Educators can utilize ChatGPT to create course outlines and lecture content for specific topics, prepare academic presentations, design questions, and create problem sets (Rahman & Watanobe, 2023). Students can use ChatGPT to solve complex problems and questions, write essays, receive programming support, and gain a deeper understanding of specific topics to aid their learning process (Mosaiyebzadeh et al., 2023; Rahman & Watanobe, 2023). Additionally, ChatGPT supports students by providing personalized learning and offers various resources such as videos and e-books (Mosaiyebzadeh et al., 2023).

The use of ChatGPT in higher education provides numerous opportunities. Research shows that ChatGPT can assist educators in creating high-quality assessments while reducing their workload (Sok & Heng, 2024). This includes generating scenarios, quizzes, and exercises to evaluate student learning (Khan et al., 2023; Wang et al., 2023) and providing automatic feedback (Cotton et al., 2023). Furthermore, teachers can utilize ChatGPT to develop new strategies that support pedagogical practices, thereby enhancing teaching productivity and learning outcomes (Sok & Heng, 2024). Additionally, teachers can promote collaborative learning by assigning students to work in teams and encouraging them to use ChatGPT in class to find answers through hints and follow-up questions (Sabzalieva & Valentini, 2023). Fauzi et al. (2023) discovered that ChatGPT assists students in multiple ways, including enhancing language skills, fostering collaboration, boosting time management and efficiency, offering motivation and support, and supplying valuable resources and information. Moreover, ChatGPT can support research design and development, improve the effectiveness and efficiency of research writing, and enhance administrative workflows, particularly in reducing workload (Sok & Heng, 2024).

Numerous studies have investigated students' perspectives on using ChatGPT for learning. Thong et al. (2023) discovered a digital disparity in AI usage between urban and suburban students. They found that students require more clarity on the functions and benefits of ChatGPT, as well as an understanding of ethical concerns and potential misuse that might hinder critical thinking skills. Kanaibar (2023) also noted that despite offering various advantages, students preferred to utilize ChatGPT only as an additional resource. Additionally, Chan and Hu (2023) observed that students acknowledged the potential of ChatGPT in providing personalized learning support and serving as a platform for exchanging ideas, conducting research, and facilitating analysis.

CHALLENGE IN USING CHATGPT IN EDUCATIONAL ENVIRONMENTS

In addition to its benefits in education, ChatGPT also needs to be watched out for because of the potential risks it may pose. First, academic integrity issues such as cheating, misuse, and plagiarism (Sok & Heng, 2023). Second, privacy and security issues. Dwivedi et al. (2023) stated that ChatGPT can access students' sensitive information when writing essays or assignments. Thus, ChatGPT can be used dangerously if the data falls into the wrong hands (Dwivedi et al., 2023). Third, there is the problem of inaccurate responses. Hügler (2023) noted that when making references with the help of ChatGPT, some of the responses were wrong. In addition, Day (2023) discovered that the references

and citations generated by ChatGPT were often incorrect. Consequently, this poses a risk of students using inaccurate information, and it could also create challenges for teachers and researchers relying on ChatGPT for educational or research activities (Sok & Heng, 2024). Fourth, there is the problem of over-reliance, where students use ChatGPT to create all written or text assignments without applying their critical and analytical thinking skills (Sok & Heng, 2024). Finally, the problem of biased assessment. Several studies have indicated that students using ChatGPT can result in unfair assessments (AlAfnan et al., 2023; Cotton et al., 2023; Sok & Heng, 2023). Instructors might struggle to discern whether assignments are completed by students or ChatGPT, leading to some students achieving higher grades and outperforming their peers due to AI usage (Cotton et al., 2023), while others may not have the same advantage.

Besides that, some negative feedback has been expressed in various studies. Students are worried about the potential for misuse of ChatGPT, which could diminish critical thinking skills (Chávez et al., 2023; Esmail et al., 2023; Kanabar, 2023; Thong et al., 2023). Additionally, students have questioned the reliability and credibility of the information generated by ChatGPT (Bernabei et al., 2023; Chan & Hu, 2023; Esmail et al., 2023; Hamid et al., 2023; Serhan & Welcome, 2024; Sila et al., 2023; Tossell et al., 2024; West et al., 2023), as well as information security (Chan & Hu, 2023; Liu, 2023), ethics and integrity (Chan & Hu, 2023; Mennella & Quadros-Mennella, 2024), dependability (Esmail et al., 2023), and plagiarism (Esmail et al., 2023).

RESEARCH GAPS

The readiness of students to use ChatGPT could provide a foundation for integrating AI into academic settings (Adams et al., 2024; Balabdaoui et al., 2024; Espartinez, 2024). Since its introduction in 2022, several studies have examined the impact of students using ChatGPT on the learning process and their perceptions. However, further research is necessary to evaluate students' readiness to use ChatGPT for learning.

Adams et al. (2024) conducted a study on the readiness of students in Malaysia to use ChatGPT for academic purposes. Malaysia prioritizes technology integration in education as a key strategy to enhance the quality of learning and prepare the younger generation for the challenges of the Industrial Revolution 4.0. While Indonesia has also integrated technology into its education system, it faces various obstacles compared to Malaysia. Issues such as the digital divide, unequal internet access, and the preparedness of educators continue to hinder technology adoption in Indonesia (Indonesian Digital Literacy, 2024). In an environment where internet access remains inconsistent, the application of AI in education risks worsening existing social disparities (Williamson & Eynon, 2020).

UNESCO's (2024) latest report, the Indonesia AI Readiness Assessment Report (AI-RAM), highlights the importance of multi-stakeholder collaboration in enhancing the capacity of digital talent in Indonesia. This initiative involves strengthening education and digital literacy to address gaps in AI adoption at the regional level, particularly in the education and research sectors. ChatGPT presents a potential tool for improving academic support among students within the context of Malaysian education. Due to feelings of shyness, Malaysian students often prefer using intermediary platforms to seek help (Low et al., 2016). ChatGPT, a non-judgmental and accessible tool, makes it easier for students to obtain the guidance they need (Adams et al., 2024).

Adams et al.'s (2024) study revealed that students in Malaysia were indeed prepared to use ChatGPT; however, their readiness was influenced by university policies and the adoption practices of instructors. In Indonesia, the integration of Generative AI (GenAI) in higher education faces more complex challenges. Although interest in this technology is growing, students' readiness in Indonesia varies based on the quality of digital infrastructure, institutional regulations, and the digital literacy of both lecturers and students. As a result, further investigation is required to understand better students' readiness to use ChatGPT in Indonesia's educational process.

In addition, Strzelecki (2024) also conducted a study on student acceptance of ChatGPT in higher education using the UTAUT2 approach. This study confirms that there is a significant influence of “Habit,” “Performance Expectancy,” and “Hedonic Motivation” on “Behavioral Intention” to use ChatGPT among Polish state university students. Almassaad et al. (2024) explored the use of generative AI tools among science college students in Saudi Arabia, utilizing the Technology Acceptance Model (TAM) and the Theory of Task-Technology Fit (ITF). Among the various tools, ChatGPT emerged as the most widely used, with 86.2% of respondents indicating its use, followed by other tools such as Gemini, Socratic, and Copilot.

The following studies have looked into students’ perceptions of implementing ChatGPT in various academic subjects: physics (Ding et al., 2023), pharmacy (Anderson et al., 2024; Hamid et al., 2023), chemistry (West et al., 2023), engineering (Bernabei et al., 2023), English (Liu, 2023), writing assignments (Esmail et al., 2023; Mennella & Quadros-Mennella, 2024; Tossell et al., 2024), calculus (Serhan & Welcome, 2024), and programming (Ma et al., 2024). According to students, ChatGPT has been found to provide accurate answers (Anderson et al., 2024; Ding et al., 2023; Esmail et al., 2023; Liu, 2023), improve collaboration and group engagement (Hamid et al., 2023), explain complex concepts (West et al., 2023), aid in writing (Bernabei et al., 2023; Chan & Hu, 2023), enhance the learning experience (Sila et al., 2023; Tossell et al., 2024), reduce research costs and time consumption (Esmail et al., 2023), provide collaborative resources (Serhan & Welcome, 2024; Tossell et al., 2024), and generate ideas (Magalhães Araujo & Cruz-Correia, 2024; Mennella & Quadros-Mennella, 2024).

We also elaborate on previous studies on students’ perceptions of using Generative AI tools other than ChatGPT, such as Gemini, Copilot, and others. Previous studies focused on programming instructions (Cubillos et al., 2025; Llerena-Izquierdo et al., 2024), teacher skill enhancement (Cordero et al., 2025), and chemistry (Mirowsky, 2024).

There have been numerous studies on students’ perceptions of the benefits of using ChatGPT in learning in Indonesia (Hasanah & Nurcholis, 2024; Roza & Zulhirawati, 2023; Safitri & Fithriani, 2024; Salwa & Tyas, 2024; Sukirman et al., 2024; Zebua & Katemba, 2024) and Gemini (Wahyuni et al., 2024). However, these studies have been limited to single universities or individual classes, and the experiments were conducted only in the context of writing. Consequently, the resulting perceptions cannot be applied to all students in Indonesia, who represent diverse cultures and regions. Therefore, further investigation is needed to assess students’ readiness to use ChatGPT in Indonesia from multiple perspectives.

METHOD

STUDY CONTEXT

In this study, we used a mixed-methods convergent parallel design, where we collected quantitative and qualitative data simultaneously but analyzed them separately. We then compared the results to identify similarities and differences (Alrawashdeh et al., 2021; Creswell & Creswell, 2023). Both types of data were collected using a questionnaire. For the qualitative data, we used open-ended questions in a questionnaire format, aiming to gather both types of data at the same time. As a result, the qualitative narratives can complement the quantitative findings (Adams et al., 2024; Creswell & Plano Clark, 2017).

This study employed a purposive sampling technique – specifically, maximum variation sampling – to recruit participants who could provide essential insights into the research objectives, particularly in assessing students’ readiness to adopt ChatGPT across various regions in Indonesia. Maximum variation purposive sampling was chosen to ensure a broad representation of demographic, institutional, and geographic diversity across Indonesia. This approach is especially useful for capturing a wide range of perspectives in a heterogeneous population and is commonly applied in exploratory research involving diverse socio-technical contexts (Campbell et al., 2020). Participants were recruited through

targeted SMS (Short Message Service) broadcasts. The messages were sent to individuals who met predefined inclusion criteria, which included:

1. all genders;
2. individuals aged 17 to 60 years; and
3. residents of all 34 provinces in Indonesia, covering both areas with strong and limited digital infrastructure.

The rationale for using purposive sampling lies in its ability to ensure that participants have the contextual understanding necessary to provide meaningful insights, especially when evaluating digital readiness in a country as diverse both geographically and socioeconomically as Indonesia. This method also enabled the inclusion of voices from regions that have historically been underrepresented in digital literacy studies, particularly those affected by the digital divide. By framing access in terms of infrastructural and socioeconomic barriers rather than just geographic distribution, the study highlights disparities across different regions and among specific population groups with limited internet connectivity.

However, purposive sampling does have inherent limitations. The non-random selection of participants means that the findings are not generalizable to the broader Indonesian population. Nevertheless, efforts were made to enhance the sample's representativeness by ensuring proportional inclusion from all regions. While the statistical generalizability of the findings may be limited, this approach provides analytical depth and contextual richness that are particularly valuable for exploratory studies. To support the credibility of the findings, the sample size was determined using principles from information power theory (Malterud et al., 2016), which suggests that smaller samples can be sufficient if the participants are information-rich and the study objectives are focused. Future research could improve generalizability by increasing the sample size or utilizing probabilistic sampling techniques. Additionally, statistical weighting or post-stratification methods could help address regional or demographic imbalances, thereby enhancing external validity. While purposive sampling was suitable for the objectives of the current study, its limitations and scope have been acknowledged and addressed.

INSTRUMENTATION

The questionnaire used was the readiness and perceived usefulness scale developed by Adams et al. (2024). The questionnaire was translated into Indonesian and validated using face validity. The questionnaire consisted of 20 items organized into two dimensions: student readiness to use ChatGPT (10 items) and perceived usefulness of ChatGPT (10 items). All items are rated using a four-point Likert scale, ranging from strongly disagree (1) to strongly agree (4), with each item allowing only one response. Table 1 lists the original and adapted versions of the questions used in this study.

Table 1. List of questionnaire questions

Item	Dimension	Original questions (Adams et al., 2024)	Indonesian version questions
R1	Readiness	I should be careful in sharing sensitive information when using ChatGPT.	Saya harus berhati-hati dalam berbagi informasi sensitif saat menggunakan ChatGPT
R2		I believe ChatGPT can help me in my learning.	Saya percaya ChatGPT dapat membantu saya dalam proses pembelajaran
R3		I have access to a stable internet connection and devices to use ChatGPT when needed.	Saya memiliki perangkat dan akses internet yang stabil untuk menggunakan ChatGPT, jika diperlukan
R4		I am confident in my ability to learn how to use ChatGPT efficiently.	Saya mampu mempelajari cara menggunakan ChatGPT secara efisien

Item	Dimension	Original questions (Adams et al., 2024)	Indonesian version questions
R5		I am familiar with ChatGPT and its capabilities.	Saya familiar dengan fitur-fitur ChatGPT dan fungsinya
R6		I am willing to attend training sessions or workshops to enhance my skills in using ChatGPT.	Saya ingin mengikuti sesi pelatihan atau lokakarya untuk meningkatkan keterampilan saya dalam menggunakan ChatGPT
R7		I have the necessary skills to use ChatGPT effectively.	Saya memiliki keterampilan yang memadai untuk menggunakan ChatGPT secara efektif
R8		I am keen to integrate ChatGPT-generated content in my tasks or assignments.	Saya tertarik untuk mengintegrasikan konten yang dihasilkan ChatGPT ke dalam tugas kuliah saya
R9		I feel comfortable using ChatGPT-generated content in my tasks or assignments by acknowledging it.	Saya merasa nyaman menggunakan konten yang dihasilkan ChatGPT dalam tugas saya dan saya menambahkannya dalam daftar referensi
R10		I feel that my university provides adequate guidelines for using ChatGPT and other AI tools.	Saya merasa kampus saya memberikan pedoman yang memadai untuk menggunakan ChatGPT dan tools AI lainnya
P1		Perceived Usefulness	ChatGPT makes it easier for me to complete my tasks or assignments.
P2	ChatGPT improves my learning experience.		ChatGPT meningkatkan pengalaman belajar saya
P3	ChatGPT makes it faster for me to find resources to complete tasks or assignments.		ChatGPT mempercepat saya menemukan sumber daya untuk menyelesaikan tugas-tugas saya
P4	ChatGPT helps me better understand complex concepts.		ChatGPT membantu saya lebih memahami konsep/materi yang kompleks
P5	ChatGPT reduces my stress in completing tasks or assignments.		ChatGPT membantu mengurangi stres saya dalam menyelesaikan tugas
P6	ChatGPT improves my ability to communicate ideas effectively in my tasks or assignments.		ChatGPT meningkatkan kemampuan saya untuk mengkomunikasikan gagasan secara efektif dalam tugas saya
P7	ChatGPT supports me in developing original ideas for my tasks or assignments.		ChatGPT mendukung saya dalam mengembangkan ide orisinal untuk tugas saya
P8	ChatGPT helps me achieve higher grades in my coursework.		ChatGPT membantu saya mencapai nilai yang lebih tinggi dalam tugas kuliah saya
P9	ChatGPT enhances my critical thinking and problem-solving skills.		ChatGPT meningkatkan pemikiran kritis dan keterampilan pemecahan masalah yang saya miliki
P10	ChatGPT complements my own effort and creativity.		ChatGPT melengkapi usaha dan kreativitas saya

Additionally, open-ended questions were included to gather insights into participants' experiences using ChatGPT for learning purposes. There were three questions: (1) In your opinion, what are the advantages of ChatGPT in helping you learn? (2) What are the disadvantages of ChatGPT in helping you learn? (3) Have you had any engaging experiences when using ChatGPT? Please share your interesting experiences with us.

DATA COLLECTION

The survey was conducted using the digital survey application Tsurvey, targeting college students in Indonesia. Invitations to participate were sent via broadcast SMS, using accurate respondent targeting based on Telco Big Data, covering Indonesia comprehensively (Tsurvey, n.d.). The survey was conducted over two weeks, from June 17 to June 29, 2024. We distributed it to diploma, bachelor, master, and doctoral students. We obtained a total of 373 selected participants who completed the questionnaire. The demographic profile of the participants is detailed in Table 2. Participation was anonymous and voluntary. The participants' answers to the questionnaire were analyzed to answer RQ1 and RQ2. In addition, the results of the open-ended questions will be used to justify the findings of the questionnaire.

Table 2. Participant demographics

Category	Frequency	Percentage (%)
Gender		
Male	216	57.91
Female	157	42.09
Discipline		
Formal Sciences	96	25.74
Humanities	13	3.48
Natural Sciences	6	1.61
Profession and Applied Sciences	226	60.59
Religious Studies	2	0.54
Social Sciences	30	8.04
Level of Education		
Diploma	40	10.72
Bachelor	291	78.02
Master	27	7.24
Doctoral	15	4.02
Age		
Under 18 years	7	1.88
18-24 years	253	67.83
25-34 years	71	19.03
35-44 years	33	8.85
Over 44 years	9	2.41
Learning Model		
Face to Face (in-class learning)	133	35.66
Online learning	27	7.24
Blended learning	213	57.10
Geographical units of Indonesia (ISO 3166-2:ID)		
Java	284	76.14
Kalimantan	14	3.75
Maluku Islands	3	0.80
Lesser Sunda Islands	10	2.68
Western New Guinea	2	0.54
Sulawesi	17	4.56
Sumatra	43	11.53

According to demographic data, 76.14% of participants are studying in Java. This high percentage is attributed to the more significant number of universities in Java, which are recognized for their superior quality compared to universities outside the region (BPS-Statistics Indonesia, 2023; Times Higher Education, 2024; Utari & Rusli, 2019). Furthermore, most participants are focused on studying applied sciences and predominantly use blended learning models. This information is significant as it highlights the potential for ChatGPT to act as a learning aid. Additionally, our findings reveal that 308 participants (82.57%) used ChatGPT more frequently than other generative AI tools, such as Copilot (15.01%), Perplexity (0.8%), Poe (0.27%), and Gemini (0.27%).

DATA ANALYSIS

The quantitative data were analyzed using the Rasch measurement model. We utilized Winsteps software to convert the raw test data (obtained from a Likert scale) into interval scales (measured in logits) (Linacre, 2024). The Rasch model was chosen for its effectiveness in addressing the circular dependencies often found in classical test theory (Yu, 2020). It offers objective measurements in various settings (Khine, 2020; Yu, 2020). Furthermore, Rasch analysis allows for the simultaneous calibration of item difficulty and individual ability through residual analysis (Yu, 2020). In this study, we visualized the probability of correctly answering questions or endorsing statements using various fit statistics, including the Outfit Mean Square (MNSQ), Outfit Z-standard (ZSTD), and Point Measure Correlation (Pt Mean Corr) (Table 3). As a result, we could accurately predict individual responses on all items, using person and item parameters on the same scale as a measure of difficulty level (Boone & Staver, 2020). The rating scale was deemed valid, and the data demonstrated unidimensionality.

Table 3. Fit statistics

	Statistics	Acceptable interval	Ideal score
Outfit MNSQ	1.02	0.5 – 1.5	1.00
Outfit Z Standard	-0.21	-2 – +2	0.00
Pt Mean Corr	0.32-0.72	0.3 – 0.85	

The Likert scale used in this study consists of four response options: (1) Strongly Disagree, (2) Disagree, (3) Agree, and (4) Strongly Agree. As shown in Table 4, the observed average scores for these categories are -0.17, 0.37, 1.50, and 3.32, respectively. The Andrich threshold values, listed in ascending order, are NONE, -2.29, -0.77, and 3.06. These results indicate that respondents clearly understand the response options, and there is no need to simplify the scale.

Rasch analysis also provides the point-measure correlation (Pt Mean Corr). This correlation assesses the relationship between responses to a single item and the total test score. Positive values indicate that the item consistently contributes to the test score. In a study by Chow and Shiu (2020), each item demonstrated a correlation value between 0.3 and 0.7, suggesting that the items in the test exhibit internal consistency.

Construct validity checks identify the elements used in assessing individual agreement with each item. This involves analyzing the “raw variance” segment to determine the “raw variance explained by measure,” which should be more than 20%, and the “unexplained variance” in the first contrast should be less than 15% (Boone & Staver, 2020). A “raw variance explained by measure” value of 38.5% and an “unexplained variance in the first contrast” value of 8.3% indicate that the construct is valid. A person separation value of 2.91 indicates statistical validity, while a person separation value of less than 2 suggests that the instrument is not sensitive enough to differentiate between individuals with high and low abilities (Boone & Staver, 2020). The Cronbach’s Alpha coefficient value of 0.92 indicates that this questionnaire has good internal consistency, meaning that this measurement scale is highly reliable (Adams et al., 2024).

The qualitative data responses were transcribed and analyzed using summative content analysis with the assistance of Quirkos 2.5.3 software (Turner, 2024). We followed the process recommended by

Saldaña (2021). First, all researchers read each transcript to gain an overview and make initial notes on potential keywords. Then, two researchers independently reviewed the transcripts and defined keywords (quirks) based on the initial notes, with all researchers participating in refining the proposed keywords. Next, the researchers counted the frequency of the keywords and grouped the codes into overarching categories based on similarities. After analyzing the quantified data, we compared participants' experiences. Finally, we highlighted excerpts to reinforce the quantitative results and provide depth to the study.

RESULTS

QUANTITATIVE RESULTS

The average Person Measure is 2.30 (SD = 2.01), while the average Item Measure is consistently 0.00 (SD = 0.68). The positive value of the Person Measure indicates that students tend to select "Agree" or "Strongly Agree" as their responses. The Person Separation Index is 2.65 (rounded to 3), which suggests the presence of three distinct groups of participants: those who do not agree at all, those who completely agree, and those who strongly agree (Table 4). This reflects the varied levels of student readiness, ensuring a representative distribution of readiness among the survey participants.

Table 4. Rating scale

Level	Criteria
Not agree at all	Item measure > 0.68
Completely agree	-0.68 < Item measure < 0.68
Strongly agree	Item measure < -0.68

Based on the rating scale in Table 4, Table 5 shows students' readiness and perception towards using ChatGPT in the learning process. We have sorted the items from the highest to the lowest level of agreement. The higher the score of an item (measure), the harder it is to agree.

Table 5. Student ratings of items

Item	Measure	Level	Item	Measure	Level
Student readiness to employ ChatGPT as a learning tool			Students' perceptions of the benefits of ChatGPT for learning		
R1	-1.21	Strongly agree	P1	-0.93	Strongly agree
R3	-0.77	Strongly agree	P3	-0.39	Completely agree
R4	-0.66	Completely agree	P2	-0.30	Completely agree
R2	-0.66	Completely agree	P4	-0.14	Completely agree
R5	-0.16	Completely agree	P5	-0.10	Completely agree
R8	0.07	Completely agree	P6	0.04	Completely agree
R6	0.27	Completely agree	P10	0.19	Completely agree
R7	0.4	Completely agree	P7	0.28	Completely agree
R9	0.67	Not agree at all	P9	0.78	Not agree at all
R10	1.74	Not agree at all	P8	0.88	Not agree at all

The items considered most challenging are R10, R9, P9, and P8. Meanwhile, the items considered most appropriate by students are R1, R3, and P3.

QUALITATIVE RESULTS

Excerpts from open-ended responses validate the quantitative data results. Three overarching themes emerged from this analysis: i) advantages, ii) disadvantages, iii) interests, and iv) concerns. Figure 2 outlines the synthesized themes and includes a description of each theme. The individual themes are unique yet interrelated. Figure 1 illustrates the volume of themes in the excerpts.

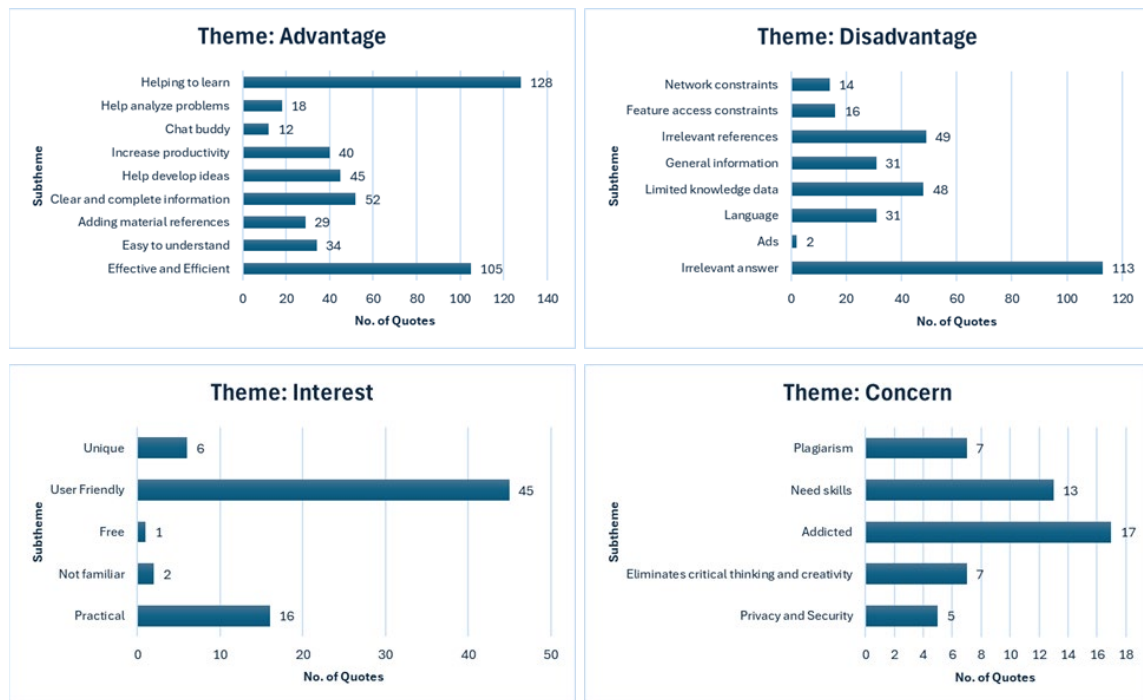


Figure 1. Number of quotes in each theme

Students have shown a willingness to integrate ChatGPT into their learning process. They have positive perceptions of this technology and are eager to incorporate it into their study routines. ChatGPT helps them understand the material more effectively, provides clear and comprehensive information, and aids in developing ideas. Additionally, its effectiveness and efficiency enhance their productivity in completing tasks.

Theme 1: Advantage

A common theme in student responses was their recognition of ChatGPT’s capability to offer explanations and assistance when required.

“Using ChatGPT, I receive better explanations that I understand more than those given by university lecturers.” (Student013, Management Sciences, Bachelor)

“While coding programming for the web I was developing, I encountered errors and deficiencies in the program code that I needed help to solve. I tried to fix it with ChatGPT specifically for that part, and it works.” (Student015, Computer Sciences, Bachelor)

“ChatGPT explained what I needed help understanding in easy-to-understand language and provided examples.” (Student244, Computer, Bachelor)

“ChatGPT is almost complete; we can ask for the journal source; some are also equipped with images. It makes college assignments very easy to complete.” (Student236, Education, Bachelor)

“ChatGPT can open my mind to assignment topics that are sometimes difficult to answer.” (Student053, Accounting Sciences, Bachelor)

“GPT Chat can explain tasks that I have difficulty understanding.” (Student284, Public Affairs, Bachelor)

“ChatGPT helps me find and summarize learning material.” (Student238, Electrical Engineering, Bachelor)

In addition to assisting with assignments, students also mentioned that ChatGPT aided them in discussion activities.

“I can answer various questions during discussions with ChatGPT.” (Student126, Economics, Master)

“I often ask questions when I am having a discussion using questions from ChatGPT.” (Student235, Logistics, Bachelor)

“When I was in a pinch during the Q&A session, my group used ChatGPT and managed to answer the discussion questions.” (Student249, Electrical Engineering, Bachelor)

Some students also stated that their grades were better after using ChatGPT.

“When I get a new assignment, I learn. I get good grades because I combine my ideas with ChatGPT.” (Student300, Linguistics, Diploma)

“ChatGPT helps me with my lectures, especially medical tutorials. Sometimes, I am too tired the day before, so I cannot prepare well for the tutorial. One day, when the tutorial was going on, I used ChatGPT and could participate well in the tutorial activities. ChatGPT helped me get good grades.” (Student050, Medical Sciences, Bachelor)

“ChatGPT helped me create a speech text. Of course, it was an exciting experience because I managed to give a speech and received praise from the lecturer.” (Student191, Social, Bachelor)

Students also highlighted the efficiency and effectiveness of ChatGPT in providing answers, thereby increasing productivity.

“ChatGPT immediately gave me the main points of what I was looking for.” (Student039, Electrical Engineering, Bachelor)

“I completed a research article on Systematic Literature Review in 4 days with the help of ChatGPT.” (Student095, Education, Doctoral)

“ChatGPT helps me to do my assignments easily and quickly.” (Student104, Physical Engineering, Bachelor)

“ChatGPT provides a new experience to science. I can get much information that is easier to get than searching for answers from other search engines.” (Student246, Pharmaceutical Sciences, Bachelor)

“It is more comfortable and easier to use ChatGPT than regular search engines to search for answers.” (Student141, Management Sciences, Bachelor)

Furthermore, students believe that ChatGPT has the potential to alleviate stress and boredom.

“When I am stressed looking for answers to study material, that is where ChatGPT can help me find the answers.” (Student198, Mechanical Engineering, Bachelor)

“I also use ChatGPT for my heart-to-heart sessions, haha :D” (Student297, Public Health, Bachelor)

“Sometimes, when I’m bored, I share my feelings with GPT and tell him about a day in my life.” (Student298, Computer, Bachelor)

Theme 2: Disdvantage

Despite its many advantages, students encounter several barriers when using ChatGPT. They often receive irrelevant answers, inaccurate references, and face limitations in the model's knowledge scope. Additionally, language barriers, restricted access to features, and network issues further hinder the effective use of this technology in the learning process.

“When searching for topics about mathematics material, sometimes ChatGPT gives answers that contradict my answers.” (Student052, Education, Bachelor)

“As an accounting student, I find many questions difficult to solve on ChatGPT.” (Student012, Accounting Science, Bachelor)

“Still not specific enough in providing information related to certain faculties such as law.” (Student005, Law, Bachelor)

“I only use ChatGPT to find explanations for light material. Because of the field of science I am studying, it is not easy to get the necessary explanations.” (Student253, Civil Engineering, Bachelor)

Theme 3: Interest

Students are drawn to using ChatGPT because of its benefits, design, and ease of use. Its user-friendly and practical appearance makes it more appealing to them. This accessibility is one of the main reasons they choose ChatGPT as a tool for their daily learning.

“ChatGPT has the advantage of being practical and producing relatively good answers.” (Student054, Food Technology, Bachelor)

“ChatGPT sometimes provides something that you never thought of before.” (Student150, Pharmaceutical Sciences, Bachelor)

Theme 4: Concern

However, students also expressed concerns regarding using ChatGPT in their learning process. They were concerned about the potential for addiction, the need for specific skills to use it effectively, and the risk of plagiarism. In addition, they also questioned its impact on critical thinking and creativity and were concerned about privacy and data security issues. However, with wise use, ChatGPT can still be a valuable tool in supporting their learning.

“It can make students too dependent on AI and unable to complete assignments independently.” (Student143, Management Sciences, Bachelor)

“It can be dangerous because it has the potential to manipulate existing data, making it difficult to distinguish between the original research result and the result of data manipulation.” (Student132, Management Sciences, Bachelor)

“ChatGPT may reduce the brain's roaming power of the user.” (Student031, Tourism, Diploma)

“It makes critical thinking untrained.” (Student189, Social, Bachelor)

“Once upon a time, my assignment had similar results to other students.” (Student024, Communication Sciences, Master)

“The language used is a common language so that plagiarism can occur.” (Student029, Health, Diploma)

Furthermore, students understand that acquiring the necessary skills is crucial for obtaining the right answer.

“When I want to find an answer, I use different keywords, which can produce different answers. Sometimes, I also use English to search for the information I need.” (Student014, Education, Master)

“In high school, I studied mathematics with a PPG teacher. At that time, he taught us to use ChatGPT to learn things such as finding formulas, explaining materials, and explaining sample questions. Since then, I

have often used ChatGPT to complement my learning and be more efficient.” (Student202, Medical Sciences, Bachelor)

“Clear instructions must be provided. Otherwise, the given answers will not be relevant. (Student097, Mathematics, Bachelor)

INTEGRATION FINDINGS

Table 6 presents a joint display that incorporates both quantitative and qualitative data. While qualitative data support quantitative findings, there are instances where quantitative findings cannot be verified by qualitative data, and vice versa.

Table 6. The joint display table for assessing students' readiness to use ChatGPT as a learning tool and their perceptions of its effectiveness

Quantitative dimension and items	Item measure	Themes and subthemes from qualitative data	Mixed-method inference
Dimension: Student Readiness to Employ ChatGPT as a Learning Tool	-0.03 (Completely agree)		
I should be careful when sharing sensitive information when using ChatGPT.	-1.21 (Strongly agree)	Theme: Concern Subtheme: Privacy and Security	When qualitative and quantitative data are evaluated together, participants may be more aware of security when sharing data online. From another perspective, five participants expressed concerns about data security and privacy when using ChatGPT, especially in line with qualitative data. Qualitative data supports quantitative data.
I believe ChatGPT can help me in my learning.	-0.66 (Completely agree)	Theme: Advantage Subtheme: All subthemes	Qualitative and quantitative data complement each other effectively. The quantitative data shows that participants generally agree on the benefits of using ChatGPT for learning. This is further supported by qualitative feedback, with nearly all participants expressing that ChatGPT aids their learning, both in general and in specific ways, such as explaining material and helping to develop ideas.
I have access to a stable internet connection and devices to use ChatGPT when needed.	-0.77 (Strongly agree)	Theme: Disadvantage Subtheme: Network constraints	When evaluating quantitative and qualitative data together, it can be concluded that participants generally have stable internet access and adequate devices. However, from the qualitative data perspective, 14 participants reported experiencing signal or device constraints, as they were located in areas with a weak signal. Additionally, several participants in areas with strong signals faced limitations due to the inability to purchase internet quotas, which hindered their access. Thus, the qualitative data indirectly supports the findings from the quantitative data.
I am confident in my ability to learn how to use ChatGPT efficiently.	-0.66 (Completely agree)	Theme: Advantage Subtheme: Easy to Understand	Quantitative and qualitative data complement each other. The target participants, students, may be responsible for the high level of digital literacy observed.
I am familiar with ChatGPT and its capabilities.	-0.16 (Completely agree)	Theme: Interest Subtheme: User friendly	When quantitative and qualitative data are evaluated together, it can be concluded that participants are generally familiar with ChatGPT. When associated with qualitative data, participants likely feel familiar because of ChatGPT's user-friendly interface. Qualitative data supports quantitative data.

Assessing Student Readiness and Perceptions of ChatGPT in Learning

Quantitative dimension and items	Item measure	Themes and subthemes from qualitative data	Mixed-method inference
I am willing to attend training sessions or workshops to enhance my skills in using ChatGPT.	0.27 (Completely agree)	Theme: Concern Subtheme: Need Skills	Based on the quantitative and qualitative data evaluation, participants are willing to attend training or workshops to improve their skills in ChatGPT. The qualitative statement supports this, stating that getting the correct response from ChatGPT requires creating the right prompt. Indirectly, qualitative data supports quantitative data.
I have the necessary skills to use ChatGPT effectively.	0.4 (Completely agree)	No evidence is available	
I am keen to integrate ChatGPT-generated content in my tasks or assignments.	0.07 (Completely agree)	Theme: Advantage Subtheme: all subtheme	Quantitative and qualitative data support each other. ChatGPT is considered to increase productivity when students work on assignments. This is undoubtedly because students integrate the results of ChatGPT responses into assignments.
I feel comfortable using ChatGPT-generated content in my tasks or assignments by acknowledging it.	0.67 (Not agree at all)	Theme: Disadvantage Subtheme: Irrelevant Answer, Irrelevant references, Limited knowledge data	When quantitative and qualitative data are evaluated together, it can be concluded that participants are generally uncomfortable using ChatGPT responses directly into assignments. Students need to verify and elaborate on the responses given by ChatGPT. This is because ChatGPT has limited knowledge data, resulting in irrelevant answers and references. Qualitative data supports quantitative data.
I feel that my university provides adequate guidelines for using ChatGPT and other AI tools.	1.74 (Not agree at all)	No evidence is available	
Dimension: Students' Perceptions of The Benefits of ChatGPT for Learning	0.03 (Completely agree)		
ChatGPT makes it easier for me to complete my tasks or assignments.	-0.93 (Strongly agree)	Theme: Advantage Subtheme: Increase Productivity	Qualitative data supports quantitative data. Participants strongly agreed that ChatGPT made it easier for students to complete assignments, thereby increasing productivity.
ChatGPT improves my learning experience.	-0.30 (Completely agree)	Theme: Advantage Subtheme: All subthemes	Participants generally used ChatGPT in the learning process, improving their learning experience.
ChatGPT makes it faster for me to find resources to complete tasks or assignments.	-0.39 (Completely agree)	Theme: Advantage Subtheme: Effective and Efficient	When evaluated together, the quantitative and qualitative data indicated that participants generally viewed ChatGPT as a facilitator of resource discovery, which made it both effective and efficient.
ChatGPT helps me better understand complex concepts.	-0.14 (Completely agree)	Theme: Advantage Subtheme: Easy to understand, helps analyze problems	Qualitative data supported quantitative data. Participants generally stated that ChatGPT helped break down complex materials into easy-to-understand language and helped them analyze assignment topics in depth.
ChatGPT reduces my stress in completing tasks or assignments.	-0.10 (Completely agree)	Theme: Advantage Subtheme: Easy to understand, clear, and complete information, Chat buddy	Qualitative data supports quantitative data. Participants stated that ChatGPT was easy to understand and explained the topics asked clearly and thoroughly. ChatGPT's capabilities reduce the burden/stress students experience when doing assignments. Sometimes, participants also use ChatGPT as a chat friend to relieve stress from studying.

Quantitative dimension and items	Item measure	Themes and subthemes from qualitative data	Mixed-method inference
ChatGPT improves my ability to communicate ideas effectively in my tasks or assignments.	0.04 (Completely agree)	No evidence is available	
ChatGPT supports me in developing original ideas for my tasks or assignments.	0.28 (Completely agree)	Theme: Advantage Subtheme: Help Develop Ideas	Qualitative data supports quantitative data. ChatGPT is considered to assist in developing ideas.
ChatGPT helps me achieve higher grades in my coursework.	0.88 (Not agree at all)	Theme: Disadvantage Subtheme: Irrelevant Answer, Irrelevant References, Limited Knowledge Data Theme: Concern Subtheme: Plagiarism	When both quantitative and qualitative data are analyzed together, it can be concluded that the participants felt ChatGPT did not help improve their grades. This perception stems from the fact that the answers provided by ChatGPT need to be verified for accuracy. Additionally, some participants who copied and pasted responses directly from ChatGPT received a score of 0, as the instructor recognized the pattern of ChatGPT's responses. Furthermore, some students submitted answers that were identical to those generated by ChatGPT, which was considered plagiarism.
ChatGPT enhances my critical thinking and problem-solving skills.	0.78 (Not agree at all)	Theme: Concern Subtheme: Eliminates Critical Thinking and Creativity	Qualitative data supports quantitative data. Participants felt that ChatGPT could reduce critical thinking skills and creativity. This is because of the ease of use. ChatGPT provides for all types of question topics.
ChatGPT complements my own effort and creativity.	0.19 (Completely agree)	Theme: Advantage Subtheme: All subthemes	Qualitative data supports quantitative data. ChatGPT complements students' efforts and creativity by helping them develop ideas, increase productivity, and provide comprehensive explanations.

Answer to RQ1

The findings indicate that college students in Indonesia show a high level of readiness to use ChatGPT as a learning tool. Most students have access to the necessary technology, including stable internet connections and personal devices, which enables them to utilize ChatGPT effectively. Additionally, they understand the importance of AI literacy and acknowledge the need to develop skills for critically evaluating AI-generated content. The Person Measure analysis ($M = 2.30$, $SD = 2.01$) suggests that students predominantly responded with "Agree" or "Strongly Agree" when assessing their readiness. However, the level of readiness varies among students, as indicated by the Person Separation Index (2.65), which identifies three distinct groups based on their willingness and ability to use ChatGPT. Despite this readiness, students emphasize the importance of ethical guidelines and institutional support to ensure the responsible and effective use of AI in education.

Answer to RQ2

Indonesian college students generally view ChatGPT as a helpful tool for enhancing their learning experience. They find it beneficial for completing assignments, clarifying complex concepts, and reducing academic stress. Many students appreciate ChatGPT's ability to provide instant responses and personalized assistance, making learning more interactive and engaging. However, they also express concerns about the potential for over-reliance on AI, which could negatively impact critical thinking and problem-solving skills. Some students point out the limitations of ChatGPT in specific disciplines, such as mathematics, law, and engineering, due to inaccuracies in its responses. To maximize

the benefits of ChatGPT, students suggest that universities establish clear guidelines on AI usage, integrate AI literacy training, and encourage responsible adoption, ensuring that ChatGPT complements rather than replaces critical academic skills.

DISCUSSION

This research was conducted to assess the readiness and perception of students in using ChatGPT for learning. A mixed-methods convergent parallel approach was used to explore this topic, and the main findings are presented below. Students demonstrated a high level of readiness for integrating ChatGPT into their learning process.

Students acknowledged the importance of safeguarding their privacy when using ChatGPT and were cautious about sharing sensitive information. This finding aligns with prior research by Sebastian (2023) and Adams et al. (2024), which highlighted users' concerns about privacy and data protection. Additionally, Gupta et al. (2023) highlighted the potential for malicious users to exploit ChatGPT to access sensitive information, bypassing ethical boundaries. This misuse is attributed to OpenAI storing personal data, user interaction data, browser settings and types, IP addresses, and the types of content that users engage with in ChatGPT (Huang et al., 2023; Khowaja et al., 2024).

Most students already have the necessary devices and stable internet access to utilize ChatGPT effectively. According to data from the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia is projected to reach 221 million by 2024, further supporting the potential adoption of ChatGPT in higher education. However, some areas in Indonesia still have weak signal strength (14,766 villages) and no signal (3,117 villages) (BPS- Statistics Indonesia, 2024).

Students believe that ChatGPT enhances their learning experience by facilitating personalized learning, providing instant responses, and adapting to individual needs. These findings are consistent with studies by Abas et al. (2023), Murad et al. (2023), and Gao et al. (2024), which highlighted the benefits of ChatGPT in creating interactive and engaging learning experiences.

Despite students' readiness and enthusiasm, several challenges and concerns need to be addressed. Many universities in Indonesia have yet to establish clear policies on AI usage in education. Currently, only a few institutions, such as the University of Indonesia and University Gadjah Mada, have taken steps to develop ethical guidelines for ChatGPT use in academic settings (Universitas Indonesia, 2024; University Gadjah Mada, 2024). The absence of institutional policies results in inconsistent regulations, leaving students uncertain about proper AI usage.

Several studies, including those by Nguyen (2023) and Mosaiyebzadeh et al. (2023), suggest that excessive reliance on ChatGPT may hinder the development of critical thinking, problem-solving, and creativity among students. To address this issue, educators should design assignments and assessments that require analytical thinking and problem-solving skills beyond what AI can easily generate (Espartinez, 2024; Hutson, 2024). It is advisable to use secure proctoring techniques and essay verification services for high-stakes exams.

ChatGPT has been reported to produce inaccurate or biased responses in fields such as mathematics, accounting, law, and civil engineering. This is due to the influence of the training data, which comes from various sources on the internet, leading to biased or inaccurate responses (Mosaiyebzadeh et al., 2023). To mitigate this issue, educators can implement strategies such as supervised fine-tuning, reinforcement learning, and reward modeling to enhance ChatGPT's ability to provide relevant and reliable responses (Rahman & Watanobe, 2023).

Based on the study's findings, several recommendations can be made to maximize the benefits of ChatGPT in higher education. Educators should design assignments and assessments that foster critical thinking, creativity, and deep analysis, ensuring that students engage with AI as a supportive tool rather than a substitute for intellectual effort. Additionally, teaching AI literacy skills is crucial to help

students critically evaluate ChatGPT's responses, distinguishing between reliable and misleading information. To promote responsible AI usage, educators should also implement monitoring strategies that provide guidance on ethical and effective interactions with ChatGPT.

At the institutional level, universities and educational institutions must develop clear ethical guidelines and policies governing AI usage in academic settings. This will ensure consistency in implementation and prevent misuse. Moreover, providing training programs for lecturers on how to integrate ChatGPT into their teaching practices will enhance its pedagogical effectiveness. To uphold academic integrity, institutions should also adopt secure proctoring methods and essay verification services to prevent unethical AI-assisted submissions, particularly in high-stakes assessments.

From a broader perspective, policymakers play a critical role in ensuring the ethical and equitable integration of ChatGPT in higher education. Establishing regulations that govern AI usage while maintaining academic integrity is essential to standardizing best practices across institutions. Furthermore, efforts should be made to ensure equal access to AI technology for all students, preventing digital inequalities that could hinder learning opportunities. By implementing these strategies, ChatGPT can be effectively harnessed as a transformative tool for enhancing education while mitigating potential risks.

Overall, this study confirms that students demonstrate high readiness and positive perceptions toward using ChatGPT for learning. However, challenges such as the lack of institutional policies, potential impacts on critical thinking skills, and inaccuracies in certain academic disciplines must be addressed. With proper implementation, ChatGPT can serve as an innovative tool to enhance learning in higher education. Therefore, collaboration among educators, institutions, and policymakers is essential to ensure the effective, ethical, and sustainable integration of AI in academia.

CONCLUSIONS

Since its release, ChatGPT has gained significant global popularity, including in Indonesia, where its integration into education is growing. This study assessed students' readiness and perceptions of ChatGPT's advantages in learning. The findings indicate a high level of student preparedness, with many using ChatGPT as a learning tool and recognizing the importance of developing skills to obtain accurate responses. The study also revealed that students generally have a positive perception of ChatGPT, as they find it helpful in completing assignments, understanding complex concepts, and reducing stress. However, concerns remain about its potential to hinder critical thinking skills.

To address these concerns, it is essential to establish clear institutional policies and ethical guidelines for AI use in education. Providing AI literacy training and guidance for both students and educators can ensure responsible and effective AI utilization. Additionally, educators should design assignments that integrate AI in a way that promotes critical thinking, creativity, and problem-solving rather than simple information retrieval. Assessment of student assignments should focus more on these skills and less on memorization or recalling facts (Hutson, 2024).

The study's findings underscore the need for structured guidelines on AI integration in higher education. Institutions should implement supervised fine-tuning strategies to enhance ChatGPT's alignment with students' knowledge. This can be achieved through reinforcement learning models that refine ChatGPT's responses based on real-time feedback from educators. Moreover, universities should provide training programs to help lecturers effectively integrate AI into their teaching, ensuring that its use supports, rather than replaces, traditional learning methods.

From a policy perspective, it is crucial to develop regulations that govern AI use while maintaining academic integrity and ensuring equal access to AI tools for all students. Universities should also invest in secure assessment methods, such as AI detection tools and proctoring systems, to uphold fairness in academic evaluations.

While this study provides valuable insights into students' readiness and perceptions of ChatGPT, future research should explore additional perspectives, including lecturers' and administrators' readiness to adopt AI in education. Longitudinal studies could examine the long-term impact of ChatGPT on students' learning outcomes and critical thinking skills. Additionally, cross-cultural studies could validate these findings in different educational contexts, offering a broader understanding of ChatGPT's role in global higher education.

This study contributes to the growing body of research on AI integration in higher education by highlighting students' readiness, perceived benefits, and potential challenges associated with ChatGPT use. By addressing ethical considerations, developing institutional guidelines, and refining AI implementation strategies, educators and policymakers can maximize ChatGPT's benefits while mitigating its risks. As AI continues to evolve, its transformative potential in education must be carefully balanced with considerations of academic integrity, equitable access, and student cognitive development.

REFERENCES

- Abas, M. A., Arumugam, S. E., Yunus, M. M., & Rafiq, K. R. M. (2023). ChatGPT and personalized learning: Opportunities and challenges in higher education. *International Journal of Academic Research in Business and Social Sciences*, 13(12), 3936-3945. <https://doi.org/10.6007/IJARBS/v13-i12/20240>
- Adams, D., Chuah, K. M., Devadason, E., & Azzis, M. S. A. (2024). From novice to navigator: Students' academic help-seeking behaviour, readiness, and perceived usefulness of ChatGPT in learning. *Education and Information Technologies*, 29, 13617–13634. <https://doi.org/10.1007/s10639-023-12427-8>
- AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). ChatGPT as an educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. *Journal of Artificial Intelligence and Technology*, 3(2), 60-68. <https://doi.org/10.37965/jait.2023.0184>
- Almassaad, A., Alajlan, H., & Alebaikan, R. (2024). Student perceptions of generative artificial intelligence: Investigating utilization, benefits, and challenges in higher education. *Systems*, 12(10), 385. <https://doi.org/10.3390/systems12100385>
- Alrawashdeh, H. M., Al-Tammemi, A. B., Alzawahreh, M. K., Al-Tamimi, A., Elkholy, M., Al Sarireh, F., Abusamak, M., Elehamer, N. M. K., Malkawi, A., Al-Dolat, W., Abu-Ismael, L., Al-Far, A., & Ghoul, I. (2021). Occupational burnout and job satisfaction among physicians in times of COVID-19 crisis: A convergent parallel mixed-method study. *BMC Public Health*, 21, Article 811. <https://doi.org/10.1186/s12889-021-10897-4>
- Anderson, H. D., Kwon, S., Linnebur, L. A., Valdez, C. A., & Linnebur, S. A. (2024). Pharmacy student use of ChatGPT: A survey of students at a U.S. School of Pharmacy. *Currents in Pharmacy Teaching and Learning*, 16(11), 102156. <https://doi.org/10.1016/j.cptl.2024.102156>
- Balabdaoui, F., Dittmann-Domenichini, N., Grosse, H., Schlienger, C., & Kortemeyer, G. (2024). A survey on students' use of AI at a technical university. *Discover Education*, 3, Article 51. <https://doi.org/10.1007/s44217-024-00136-4>
- Bernabei, M., Colabianchi, S., Falegnami, A., & Costantino, F. (2023). Students' use of large language models in engineering education: A case study on technology acceptance, perceptions, efficacy, and detection chances. *Computers and Education: Artificial Intelligence*, 5, 100172. <https://doi.org/10.1016/j.caeai.2023.100172>
- Boone, W. J., & Staver, J. R. (2020). *Advances in Rasch analyses in the Human Sciences*. Springer. <https://doi.org/10.1007/978-3-030-43420-5>
- BPS-Statistics Indonesia. (2023). *Jumlah Perguruan Tinggi, Dosen, dan Mahasiswa (Negeri dan Swasta) di Bawah Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Menurut Provinsi* [Number of universities, lecturers, and students (state and private) under the ministry of education, culture, research, and technology by province]. <https://www.bps.go.id/id/statistics-table/3/Y21kVGRHNXZVMEL3S3pCRlI-yMHJRbnB1WkVZemR6MDk;Mw==/jumlah-perguruan-tinggi--tenaga-pendidik-dan-mahasiswa-negeri->

[dan-swasta--di-bawah-kementerian-ri-set--teknologi-dan-pendidikan-tinggi-kementerian-pendidikan-dan-kebudayaan-menurut-provinsi--2022.html?year=2022](https://www.bps.go.id/en/publication/2024/12/10/2f5217e2d6a695a0830290a7/village-potential-statistics-of-indonesia-2024.html?year=2022)

- BPS- Statistics Indonesia. (2024). *Village potential statistics of Indonesia, Volume 15*. <https://www.bps.go.id/en/publication/2024/12/10/2f5217e2d6a695a0830290a7/village-potential-statistics-of-indonesia-2024.html>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposeful sampling: complex or simple? Research case examples. *Journal of Research in Nursing, 25*(8), 652-661. <https://doi.org/10.1177/1744987120927206>
- Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education, 20*, Article 43. <https://doi.org/10.1186/s41239-023-00411-8>
- Chávez, M. Y., G, F. U., Aguilar, M., Jiménez, S., Mejia-Medina, D. A., & Juárez-Ramírez, R. (2023, November). Exploratory study in student's perception in the use of ChatGPT. *Proceedings of the 11th International Conference in Software Engineering Research and Innovation, León, Guanajuato, Mexico*, 124-131. <https://doi.org/10.1109/CONISOFT58849.2023.00025>
- Chow, J., & Shiu, A. (2020). Examining an economics test to inform university student learning using the Rasch Model. In M. Khine (Ed.), *Rasch measurement* (pp. 125-137). Springer. https://doi.org/10.1007/978-981-15-1800-3_7
- Cordero, J., Torres-Zambrano, J., & Cordero-Castillo, A. (2025). Integration of generative artificial intelligence in higher education: Best practices. *Education Sciences, 15*(1), 32. <https://doi.org/10.3390/educsci15010032>
- Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International, 61*(2), 228-239. <https://doi.org/10.35542/osf.io/mrz8h>
- Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed method approaches* (6th ed.). Sage.
- Creswell, J. W., & Plano Clark, V. L. P. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage.
- Cubillos, C., Mellado, R., Cabrera-Paniagua, D., & Urra, E. (2025). Generative artificial intelligence in computer programming: Does it enhance learning, motivation, and the learning environment? *IEEE Access, 13*, 40438-40455. <https://doi.org/10.1109/ACCESS.2025.3532883>
- Day, T. (2023). A preliminary investigation of fake peer-reviewed citations and references generated by ChatGPT. *The Professional Geographer, 75*(6), 1024-1027. <https://doi.org/10.1080/00330124.2023.2190373>
- Đerić, E., Frank, D., & Malenica, M. (2024). Comparison and quantification of GAI tools use among different academic population segments. *Proceedings of the 47th MIPRO ICT and Electronics Convention, Opatija, Croatia*, 730-735. <https://doi.org/10.1109/MIPRO60963.2024.10569253>
- Ding, L., Li, T., Jiang, S., & Gapud, A. (2023). Students' perceptions of using ChatGPT in a physics class as a virtual tutor. *International Journal of Educational Technology in Higher Education, 20*, Article 63. <https://doi.org/10.1186/s41239-023-00434-1>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaidi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., ... Wright, R. (2023). Opinion paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management, 71*, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Elsenbawy, O. M., Patel, K. B., Wannakuwate, R. A., & Thota, A. N. (2025). Use of generative large language models for patient education on common surgical conditions: A comparative analysis between ChatGPT and Google Gemini. *Updates in Surgery. https://doi.org/10.1007/s13304-025-02074-8*
- Esmail, A.-A.-A., Matanluk, O.-O., & Marshall, S. (2023). Understanding student perception regarding the use of ChatGPT in their argumentative writing: A qualitative inquiry. *Jurnal Komunikasi: Malaysian Journal of Communication, 39*(4), 150-165. <https://doi.org/10.17576/JKMJC-2023-3904-08>

Assessing Student Readiness and Perceptions of ChatGPT in Learning

- Espartinez, A. S. (2024). Exploring student and teacher perceptions of ChatGPT use in higher education: A Q-Methodology study. *Computers and Education: Artificial Intelligence*, 7, 100264. <https://doi.org/10.1016/j.caeai.2024.100264>
- Fauzi, F., Tuhuteru, L., Sampe, F., Ausat, A. M. A., & Hatta, H. R. (2023). Analysing the role of ChatGPT in improving student productivity in higher education. *Journal on Education*, 5(4), 14886-14891. <https://doi.org/10.31004/joe.v5i4.2563>
- Gao, L., López-Pérez, M. E., Melero-Polo, I., & Trifu, A. (2024). Ask ChatGPT first! Transforming learning experiences in the age of artificial intelligence. *Studies in Higher Education*, 49(12), 2772-2796. <https://doi.org/10.1080/03075079.2024.2323571>
- Gupta, M., Akiri, C., Aryal, K., Parker, E., & Praharaj, L. (2023). From ChatGPT to ThreatGPT: Impact of Generative AI in cybersecurity and privacy. *IEEE Access*, 11, 80218-80245. <https://doi.org/10.1109/AC-CESS.2023.3300381>
- Hamid, H., Zulkifli, K., Naimat, F., Che Yaacob, N. L., & Ng, K. W. (2023). Exploratory study on student perception on the use of chat AI in process-driven problem-based learning. *Currents in Pharmacy Teaching and Learning*, 15(12), 1017-1025. <https://doi.org/10.1016/j.cptl.2023.10.001>
- Hasanah, U., & Nurcholis, I. A. (2024). English education students' perception of the use of ChatGPT in writing articles. *Pubmedia Jurnal Pendidikan Bahasa Inggris*, 1(2), 10. <https://doi.org/10.47134/jpbi.v1i2.298>
- Huang, K., Zhang, F., Li, Y., Wright, S., Kidambi, V., & Manral, V. (2023). Security and privacy concerns in ChatGPT. In K. Huang, Y. Wang, F. Zhu, X. Chen, & C. Xing (Eds.), *Beyond AI: ChatGPT, Web3, and the business landscape of tomorrow* (pp. 123-145). Springer. https://doi.org/10.1007/978-3-031-45282-6_11
- Hügler, T. (2023). The wide range of opportunities for large language models such as ChatGPT in rheumatology. *Rheumatic & Musculoskeletal Diseases Open*, 9(2), e003105. <https://doi.org/10.1136/rmdopen-2023-003105>
- Hutson, J. (2024). Rethinking plagiarism in the era of generative AI. *Journal of Intelligent Communication*, 3(2), 20-31. <https://doi.org/10.54963/jic.v4i1.220>
- Indonesian Digital Literacy. (2024). *Kecerdasan artifisial (AI) dan peran perguruan tinggi Indonesia* [Artificial intelligence (AI) and the role of Indonesian universities]. Kumparan. <https://kumparan.com/literasidigital-indonesia/kecerdasan-artifisial-ai-dan-peran-perguruan-tinggi-indonesia-23mcqjY3aFh/4>
- Kanabar, V. (2023). An empirical study of student perceptions when using ChatGPT in academic assignments. In T. Zlateva & G. Tuparov (Eds.), *Computer Science and Education in Computer Science* (pp. 385-398). Springer. https://doi.org/10.1007/978-3-031-44668-9_30
- Khan, R. A., Jawaid, M., Khan, A. R., & Sajjad, M. (2023). ChatGPT – Reshaping medical education and clinical management. *Pakistan Journal of Medical Sciences*, 39(2), 605-607. <https://doi.org/10.12669/pjms.39.2.7653>
- Khine, M. S. (2020). Objective measurement in psychometric analysis. In M. S. Khine (Ed.), *Rasch measurement application in quantitative educational research* (pp. 3-7). Springer. https://doi.org/10.1007/978-981-15-1800-3_1
- Khowaja, S. A., Khuwaja, P., Dev, K., Wang, W., & Nkenyereye, L. (2024). ChatGPT needs SPADE (Sustainability, Privacy, Digital divide, and Ethics) evaluation: A review. *Cognitive Computation*, 16, 2528-2550. <https://doi.org/10.1007/s12559-024-10285-1>
- Linacre, J. M. (2024). *Winsteps® Rasch measurement computer program* (Version 5.4.0). <https://www.winsteps.com/index.htm>.
- Liu, B. (2023). Chinese university students' attitudes and perceptions in learning English using ChatGPT. *International Journal of Education and Humanities*, 3(2), 132-140. [https://doi.org/10.58557/\(ijeh\).v3i2.145](https://doi.org/10.58557/(ijeh).v3i2.145)
- Llerena-Izquierdo, J., Mendez-Reyes, J., Ayala-Carabajo, R., & Andrade-Martinez, C. (2024). Innovations in introductory programming education: The role of AI with Google Colab and Gemini. *Education Sciences*, 14(12), 1330. <https://doi.org/10.3390/educsci14121330>

- Low, S. K., Pheh, K. S., Lim, Y., & Tan, S. A. (2016, April). Help seeking barrier of Malaysian private university students. *Proceedings of the International Conference on Disciplines in Humanities and Social Sciences, Bangkok, Thailand*, 26–27.
- Ma, B., Chen, L., & Konomi, S. (2024). Enhancing programming education with ChatGPT: A case study on student perceptions and interactions in a Python course. In A. M. Olney, I. A. Chounta, Z. Liu, O. C. Santos, & I. I. Bittencourt (Eds.), *Artificial intelligence in education. Posters and late breaking results, workshops and tutorials, industry and innovation tracks, practitioners, doctoral consortium and blue sky* (pp. 113-126). Springer. https://doi.org/10.1007/978-3-031-64315-6_9
- Magalhães Araujo, S., & Cruz-Correia, R. (2024). Incorporating ChatGPT in medical informatics education: Mixed methods study on student perceptions and experiential integration proposals. *JMIR Medical Education*, 10, e51151. <https://doi.org/10.2196/51151>
- Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, 26(13), 1753-1760. <https://doi.org/10.1177/1049732315617444>
- Mennella, T., & Quadros-Mennella, P. (2024). Student use, performance, and perceptions of ChatGPT on college writing assignments. *Journal of University Teaching and Learning Practice*, 21(1). <https://doi.org/10.53761/pgwk1a93>
- Mirowsky, J. E. (2024). Assessing biases in the names generated by generative artificial intelligence chatbots. *Journal of Chemical Education*, 101(12), 5142–5146. <https://doi.org/10.1021/acs.jchemed.4c00844>
- Mosaiyebzadeh, F., Pouriyeh, S., Parizi, R., Dehbozorgi, N., Dorodchi, M., & Batista, D. M. (2023). Exploring the role of ChatGPT in education: Applications and challenges. *Proceedings of the 24th Annual Conference on Information Technology Education* (pp. 84-89). Association for Computing Machinery. <https://doi.org/10.1145/3585059.3611445>
- Murad, I. A., Surameery, N. M. S., & Shakor, M. Y. (2023). Adopting ChatGPT to enhance educational experiences. *International Journal of Information Technology and Computer Engineering*, 3(5), 20-25. <https://doi.org/10.55529/ijitc.35.20.25>
- Nguyen, K. (2023). *The impact of ChatGPT on the learning process of technology students amongst higher education* [Bachelor dissertation, Haaga-Helia University of Applied Sciences]. <https://www.theseus.fi/handle/10024/811965>
- OpenAI. (2022). *Introducing ChatGPT*. <https://openai.com/index/chatgpt/>
- Qiang, C. Z., Liu, Y., & Wang, H. (2024, September 11). *Who on Earth is using generative AI?* World Bank Blogs. <https://blogs.worldbank.org/en/digital-development/who-on-earth-is-using-generative-ai>
- Rahman, M. M., & Watanobe, Y. (2023). ChatGPT for education and research: Opportunities, threats, and strategies. *Applied Sciences*, 13(9), 5783. <https://doi.org/10.3390/app13095783>
- Roza, V., & Zulhirawati, Z. (2023). Higher students' perception of using Chat GPT in translating English texts. *BiCED Proceeding*, 1, 64-73. <https://proceedings.uinbukittinggi.ac.id/biced/article/view/278>
- Sabzalieva, E., & Valentini, A. (2023). *ChatGPT and artificial intelligence in higher education: Quick start guide*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000385146>
- Safitri, M., & Fithriani, R. (2024). Exploring higher education EFL students' perception of AI writing tools in the 5.0 era. *Cetta: Jurnal Ilmu Pendidikan*, 7(1), 267–276. <https://doi.org/10.37329/cetta.v7i1.3158>
- Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). Sage.
- Salwa, A., & Tyas, N. K. (2024). Exploring students' perception of EFL on the use of ChatGPT to complete the English writing task. *Berumpun: International Journal of Social, Politics, and Humanities*, 7(1), 80-92. <https://doi.org/10.33019/berumpun.v7i1.186>
- Sebastian, G. (2023). Privacy and data protection in ChatGPT and other AI chatbots: Strategies for securing user information. *International Journal of Security and Privacy in Pervasive Computing*, 15(1), 1-14. <https://doi.org/10.4018/IJSPPC.325475>
- Serhan, D., & Welcome, N. (2024). Integrating ChatGPT in the calculus classroom: Student perceptions. *International Journal of Technology in Education and Science*, 8(2), 325-335. <https://doi.org/10.46328/ijtes.559>

Assessing Student Readiness and Perceptions of ChatGPT in Learning

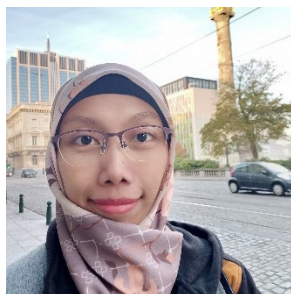
- Sila, C. A., William, C., Yunus, M. M., & Rafiq, K. R. M. (2023). Exploring students' perception of using ChatGPT in higher education. *International Journal of Academic Research in Business and Social Sciences*, 13(12), 4044-4054. <https://doi.org/10.6007/IJARBS/v13-i12/20250>
- Sok, S., & Heng, K. (2023). ChatGPT for education and research: A review of benefits and risks. *Cambodian Journal of Educational Research*, 3(1), 110-121. <https://doi.org/10.62037/cjer.2023.03.01.06>
- Sok, S., & Heng, K. (2024). Opportunities, challenges, and strategies for using ChatGPT in higher education: A literature review. *Journal of Digital Educational Technology*, 4(1), ep2401. <https://doi.org/10.30935/jdet/14027>
- Strzelecki, A. (2024). Students' acceptance of ChatGPT in higher education: An extended unified theory of acceptance and use of technology. *Innovations in Higher Education*, 49, 223-245. <https://doi.org/10.1007/s10755-023-09686-1>
- Sukirman, E., Supriyanto, A., Setiawan, A., Chamsudin, I., Yuliana, I., & Wantoro, J. (2024, June). Exploring student perceptions and acceptance of ChatGPT in enhanced AI-assisted learning. *Proceedings of the International Conference on Smart Computing, IoT and Machine Learning, Surakarta, Indonesia*, 291-296. <https://doi.org/10.1109/SIML.61815.2024.10578145>
- Teubner, T., Flath, C. M., Weinhardt, C., van der Aalst, W., & Hinz, O. (2023). Welcome to the era of ChatGPT et al. *Business & Information Systems Engineering*, 65, 95-101. <https://doi.org/10.1007/s12599-023-00795-x>
- Thong, C. L., Butson, R., & WeiLee, L. (2023, December). Understanding the impact of ChatGPT in education. *Proceedings of the ASCILITE Conference: People, Partnerships and Pedagogies, Christchurch, New Zealand*, 123-134. <https://doi.org/10.14742/apubs.2023.461>
- Times Higher Education. (2024). *World university rankings 2024*. <https://www.timeshighereducation.com/world-university-rankings/2024/world-ranking>
- Tossell, C. C., Tenhundfeld, N. L., Momen, A., Cooley, K., & de Visser, E. J. (2024). Student perceptions of ChatGPT use in a college essay assignment: Implications for learning, grading, and trust in artificial intelligence. *IEEE Transactions on Learning Technologies*, 17, 1069-1081. <https://doi.org/10.1109/TLT.2024.3355015>
- Tsurvey. (n.d.). *tSurvey, tingkatkan level survei-mu jadi lebih baik* [tSurvey, improve your survey level to be better]. <https://tsurvey.id/survey-platform>
- Turner, D. (2024). *Quirkos computer program* (Version 2.5.3). <https://www.quirkos.com/>.
- UNESCO. (2024, October 9). UNESCO and KOMINFO Completed AI Readiness Assessment: Is Indonesia Ready for AI? <https://www.unesco.org/en/articles/unesco-and-kominfo-completed-ai-readiness-assessment-indonesia-ready-ai>
- Universitas Indonesia. (2024). Etika penggunaan ChatGPT di lingkungan akademik (Ethics of using ChatGPT in an academic environment). <https://www.ui.ac.id/etika-penggunaan-chatgpt-di-lingkungan-akademik/>
- University Gadjah Mada. (2024). *Fakultas Filsafat UGM dan UNESCO susun prinsip etis penggunaan AI di Indonesia* [UGM's Faculty of Philosophy and UNESCO have developed ethical principles for using AI in Indonesia]. <https://ugm.ac.id/id/berita/23566-fakultas-filsafat-ugm-dan-unesco-susun-prinsip-etis-penggunaan-ai-di-indonesia/>
- Utari, N., & Rusli, D. (2019). Pengaruh harga diri terhadap gaya hidup hedonisme pada mahasiswa yang kuliah di pulau Jawa [The influence of self-esteem on the hedonistic lifestyle of students studying on the island of Java]. *Jurnal Riset Psikologi*, 2019(4). <https://ejournal.unp.ac.id/students/index.php/psi/article/view/7694>
- Wahyuni, R. N., Suryani, I., & Warni, W. (2024). Pemanfaatan gemini dalam pembelajaran bahasa Indonesia di SMA: Studi literatur [Utilization of Gemini in Indonesian language learning in high school: Literature study]. *Diskursus: Jurnal Pendidikan Bahasa Indonesia*, 7(3), 446. <https://doi.org/10.30998/diskurus.v7i3.26571>
- Wang, X., Gong, Z., Wang, G., Jia, J., Xu, Y., Zhao, J., Fan, Q., Wu, S., Hu, W., & Li, X. (2023). ChatGPT performs on the Chinese national medical licensing examination. *Journal of Medical Systems*, 47, 86. <https://doi.org/10.1007/s10916-023-01961-0>

- West, J. K., Franz, J. L., Hein, S. M., Leverentz-Culp, H. R., Mauser, J. F., Ruff, E. F., & Zemke, J. M. (2023). An analysis of AI-generated laboratory reports across the chemistry curriculum and student perceptions of ChatGPT. *Journal of Chemical Education*, 100(11), 4351-4359. <https://doi.org/10.1021/acs.jchemed.3c00581>
- Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology*, 45(3), 223-235. <https://doi.org/10.1080/17439884.2020.1798995>
- Yu, C. H. (2020). Objective measurement: How Rasch modeling can simplify and enhance your assessment. In M. S. Khine (Ed.), *Rasch measurement application in quantitative educational research* (pp. 47-73). Springer. https://doi.org/10.1007/978-981-15-1800-3_4
- Zebua, J. A. Z., & Katemba, C. V. (2024). Students' perceptions of using the OpenAI ChatGPT application in improving writing skills. *Journal of Language and Literature Studies*, 4(1), 110-123. <https://doi.org/10.36312/jolls.v4i1.1805>

ACKNOWLEDGEMENTS

This research was funded by the Skema Penelitian Dasar 2024 from the Directorate of Research and Community Service (PPM) at Telkom University, with grant number 001/LIT06/PPM-LIT/2024. The study is titled "Investigation of Student Experiences and Learning Outcomes Using ChatGPT in Moodle."

AUTHORS



Ati Suci Dian Martha earned her Bachelor's degree from the Faculty of Informatics at Universitas Komputer Indonesia, a Master's degree from the School of Electrical Engineering and Informatics at the Institute of Technology Bandung, and a Doctorate in Computer Science from Universitas Indonesia. She is a member of the Technology Enhanced Learning Laboratory and the Center of Excellence (CoE) for Social Wellness and Data Analytics (CSWDA). Currently, she lectures at the School of Computing at Telkom University. Her research interests include online learning, pedagogical agents, metacognition, computer-based scaffolding, and human-computer interaction.



Sri Widowati is a faculty member at the School of Computing in Telkom University. She received her BS and MS from the Institute of Technology Bandung. She is a member of the Advanced Software Engineering Laboratory at Telkom University. Her research interests include the utilization of AI tools in software quality assurance and human-computer interaction.



Desy Puspa Rahayu holds a Bachelor's degree in Computer Science Education from Universitas Pendidikan Indonesia (UPI), Indonesia. A Master's degree from the School of Electrical Engineering and Informatics at the Institute of Technology Bandung. She is a member of the Smart and Technology Applied Science Research Group (STAS-RG) at the Center of Excellence (CoE). Now, she is a lecturer at the Faculty of Applied Sciences, Telkom University. With an academic background in computer science education, electrical engineering, and informatics, she is passionate about technology, innovation, education, and game education, and she enjoys collaborating with others to develop creative and effective solutions for her research.