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Assessing student perspectives on ChatGPT in higher education: a quantitative analysis

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ABSTRACT

The rapid advancement of artificial intelligence (AI) has transformed higher education, with ChatGPT increasingly used as an academic support tool. This study examines university students' perceptions of ChatGPT in Indonesian higher education through a quantitative survey involving 56 undergraduate, master's, and doctoral students at Universitas Negeri Medan. The survey assessed perceived ease of use, quality of responses, learning support, and ethical concerns related to ChatGPT usage. The results indicate that most students perceive ChatGPT as easy to use and helpful for understanding academic materials and improving learning efficiency. However, concerns regarding academic integrity, overreliance, and potential reductions in problem-solving skills were also identified. Significant differences in perceptions emerged across academic levels, with undergraduate students expressing higher enthusiasm, while postgraduate and doctoral students demonstrated greater caution toward ethical and pedagogical implications. These findings highlight both the opportunities and challenges of integrating generative AI into higher education. This study provides the first quantitative empirical evidence on ChatGPT perceptions in Indonesian higher education and underscores the importance of embedding AI literacy, ethical guidelines, and critical thinking strategies into university curricula to ensure responsible and effective AI adoption.

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1. INTRODUCTION

In the last few decades, the rapid advancement of artificial intelligence (AI) has significantly reshaped many sectors of human life, with education being one of the most impacted fields [1], [2]. AI technologies are now capable of performing complex cognitive tasks such as data analysis, pattern recognition, decision-making, and learning, tasks that were traditionally confined to human intelligence [3], [4]. In educational contexts, AI has introduced transformative changes by enhancing learning efficiency, broadening access to educational opportunities, and personalizing learning experiences to fit individual student profiles [5], [6]. Furthermore, AI has contributed to the design of adaptive learning systems and intelligent tutoring applications, which dynamically adjust content delivery according to students' learning progress [7], [8].

One of the most widely recognized applications of AI in education today is the ChatGPT [9], [10]. As an AI-based conversational agent, ChatGPT has demonstrated remarkable abilities to understand and

generate human-like responses across diverse domains [11]. Within higher education, students increasingly utilize ChatGPT for a variety of academic activities, including clarifying complex concepts, assisting with writing assignments, generating research ideas, summarizing articles, and supporting data analysis tasks [12], [13]. The accessibility of ChatGPT, combined with its ability to provide instant feedback and structured explanations, has made it a valuable tool for self-directed learning and academic support. However, the widespread adoption of AI-powered tools like ChatGPT also raises critical concerns regarding their influence on fundamental academic competencies. A growing body of literature warns that overreliance on AI may diminish students' abilities in critical thinking, creativity, and independent problem-solving skills that are essential for long-term academic and professional success [14]. Furthermore, the ease with which AI can produce comprehensive responses introduces the risk of academic misconduct, such as plagiarism, superficial learning, and the erosion of original thought [15]. These issues highlight the urgent need for educational institutions to address not only how AI is integrated into learning environments, but also how students are guided in using these technologies responsibly and ethically [16].

Moreover, the paradigm shifts from traditional, instructor-centered learning to AI-mediated, learner-centered environments demands that students adapt to new modes of knowledge acquisition and engagement [17]. Students are now required to be more self-regulated, critical, and digitally literate [18]. While the potential of AI to augment learning is undeniable, its responsible and effective use hinges on students' ability to critically assess, evaluate, and ethically apply the information generated by these systems [19]. Thus, fostering digital literacy and ethical awareness becomes paramount in preparing students for an increasingly AI-driven world [20]. Despite the recognized importance of these challenges, empirical studies that specifically explore students' perceptions and experiences with ChatGPT in higher education remain scarce [21]. Much of the existing research has focused on the general advantages of AI technologies or the technical development of AI models, rather than examining how students interact with, benefit from, and are challenged by AI tools within their learning processes [22]. Understanding students' perceptions is crucial because it offers direct insight into how these technologies are shaping learning behaviors, academic achievement, and skill development at the grassroots level [23].

In response to this research gap, the present study aims to investigate university students' perceptions regarding the use of ChatGPT for academic purposes [24]. Through a quantitative approach, this research seeks to assess the extent to which students use ChatGPT to complete assignments, deepen their understanding of academic concepts, and prepare research projects [25]. Additionally, the study explores the perceived impact of ChatGPT usage on students' development of critical skills such as analytical thinking, creativity, and problem-solving. By focusing on the users' experiences and reflections, this study not only contributes new empirical insights but also proposes strategic recommendations for integrating AI tools into educational practices in a way that supports cognitive growth and academic integrity. Ultimately, the findings are expected to inform educators, policymakers, and developers in designing AI-enhanced learning environments that maximize educational benefits while mitigating potential drawbacks.

2. METHOD

This study employed a quantitative cross-sectional survey design to examine university students' perceptions of ChatGPT (version 3.5) in higher education [26]. A survey approach was selected as it enables the systematic collection of students' attitudes, experiences, and evaluations of AI-based tools used for academic purposes [27]. Data were collected using a structured questionnaire adapted from previously validated instruments investigating students' perceptions of ChatGPT in educational contexts. The questionnaire comprised 24 items representing both negative and positive perception dimensions. Negative perception indicators addressed concerns related to misuse, academic dishonesty, overreliance, reliability of information, and potential negative impacts on learning. Positive perception indicators focused on ease of use, quality and clarity of responses, learning motivation, efficiency, interactivity, and optimism toward ChatGPT's educational potential.

All questionnaire items, their indicators, and corresponding statements are presented in Table 1. Table 1 presents all questionnaire items, grouped by perception dimension and polarity (positive and negative). Responses were measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) [28]. Minor wording modifications were made to ensure clarity and suitability for the higher education context while maintaining the original constructs of the instrument.

The study population consisted of undergraduate, master's, and doctoral students enrolled at Universitas Negeri Medan. Participants were recruited through official academic WhatsApp groups by distributing an online survey link. Inclusion criteria required participants to be actively enrolled students who had prior experience using ChatGPT version 3.5 for coursework, assignments, or academic projects. First-year undergraduate students were excluded due to limited exposure to ChatGPT during the data collection period. A total of 56 valid responses met the inclusion criteria and were included in the analysis.

Before completing the questionnaire, participants responded to a screening question confirming their prior use of ChatGPT for academic purposes. The survey was completed voluntarily and anonymously, and no personally identifiable information was collected.

Data were analyzed using IBM SPSS statistics version 21. The internal consistency of the questionnaire was assessed using Cronbach's alpha, yielding a reliability coefficient of 0.770, which indicates good internal reliability. Descriptive statistics were used to summarize students' responses for each item presented in Table 1. Furthermore, one-way analysis of variance (ANOVA) with a significance level of α=0.05 was conducted to examine differences in students' perceptions across academic levels and professional backgrounds.

Table 1. Questionnaire items measuring students' perceptions of ChatGPT

No.	Dimension	Polarity	Statement
1	Ethical and misuse concerns	Negative	ChatGPT has the potential to be misused for manipulation or unethical purposes.
2	Cognitive dependency	Negative	Human intelligence is necessary to make effective use of ChatGPT.
3	Information reliability	Negative	ChatGPT may provide incorrect or unreliable information.
4	Academic integrity	Negative	The availability of ChatGPT may increase the likelihood of academic dishonesty.
5	Learning impact	Negative	ChatGPT may negatively affect learning because students rely on it instead of developing their own problem-solving skills.
6	Academic integrity	Negative	Using ChatGPT for academic work can lead to plagiarism issues.
7	Cognitive effort	Negative	Finding accurate answers through ChatGPT may require deeper analysis.
8	User understanding	Negative	I do not fully understand how ChatGPT works, which makes me uncertain about its impact on my learning.
9	Usability	Positive	ChatGPT is easy to use.
10	User perception	Positive	I am impressed with ChatGPT's capabilities.
11	Response quality	Positive	ChatGPT provides better answers than traditional search engines such as Google.
12	Response quality	Positive	ChatGPT provides informative and clear explanations.
13	Response quality	Positive	The responses generated by ChatGPT are well-structured and easy to understand.
14	Learning support	Positive	ChatGPT enriches and supports the learning experience.
15	Learning motivation	Positive	ChatGPT motivates students to explore academic topics more deeply.
16	Academic support	Positive	ChatGPT effectively supports work- and education-related questions.
17	Learning efficiency	Positive	ChatGPT allows me to complete academic tasks more efficiently.
18	Interaction	Positive	ChatGPT enables follow-up questions and natural, human-like interaction.
19	Engagement	Positive	ChatGPT provides an interactive and engaging learning experience.
20	User experience	Positive	ChatGPT enhances the learning experience by mimicking human interaction.
21	Enjoyment	Positive	Learning activities are more enjoyable when using ChatGPT.
22	Future outlook	Positive	I feel optimistic about ChatGPT's potential to enhance education and knowledge.
23	Future outlook	Positive	The quality of ChatGPT will continue to improve over time.
24	Overall attitude	Positive	I feel optimistic about ChatGPT.

3. RESULTS AND DISCUSSION

Table 2 presents survey results on perceptions of ChatGPT across three respondent groups (undergraduate (S1), master's (S2), and doctoral (S3)). It consists of various statements evaluating ChatGPT's potential risks, usefulness, and impact on learning. The percentages indicate the level of agreement among respondents, highlighting concerns such as manipulation, academic dishonesty, and dependency, as well as benefits like ease of use, informative responses, and creative enhancement. The data provides insights into the varying levels of confidence, skepticism, and optimism regarding ChatGPT's role in education and daily tasks. Table 2 shows the research results.

The study involved a diverse group of participants, including S1, S2, and S3 students, which allowed for a comprehensive exploration of academic perspectives on the use of ChatGPT. By categorizing respondents according to their educational level, the research was able to highlight variations in perception and usage patterns across different stages of academic development. The findings revealed that ChatGPT is widely recognized as a valuable tool within higher education, although opinions about its use varied depending on the respondents' academic level. S1 generally expressed higher enthusiasm, frequently mentioning the ease of use and the platform's role in facilitating their learning processes. In contrast, S2 and S3 students tended to approach ChatGPT more critically. These groups raised concerns related to the

accuracy of the information generated, the risks to academic integrity, and the potential for students to develop an over-reliance on AI-assisted learning.

Overall, most students agreed that ChatGPT significantly enhanced their learning experience by offering rapid, structured responses to academic questions. Usability rates were notably high across all educational levels, with 90% of S1 students, 85% of S2 students, and 95% of S3 students affirming the ease of interacting with ChatGPT. Furthermore, many respondents acknowledged the platform's ability to deliver well-organized and informative content, with agreement rates of 75% among S1 students, 85% among S2 students, and 90% among S3 students. Despite these advantages, concerns about academic misconduct emerged as a significant theme. A substantial proportion of students expressed apprehension that ChatGPT could facilitate unethical academic behavior, such as plagiarism or superficial learning. Notably, 70% of S1 students, 60% of S2 students, and 50% of S3 students agreed that the misuse of ChatGPT could compromise academic honesty. These concerns were more pronounced among postgraduate and doctoral students, who emphasized the need to uphold ethical standards in academic work.

Table 2. Design students' perception of ChatGPT

No	Statement	Undergraduate S1 (%)	Master's S2 (%)	Doctoral S3 (%)
1	ChatGPT has the potential to create opportunities for manipulation and misuse.	65	55	45
2	Human intelligence is necessary to make good use of ChatGPT.	85	80	70
3	ChatGPT is not perfect and may provide inaccurate information.	70	65	60
4	The availability of ChatGPT may increase the likelihood of academic dishonesty.	78	70	58
5	ChatGPT may negatively affect learning because students may rely on it rather than developing their own problem-solving skills.	80	75	65
6	Using ChatGPT for academic work can lead to plagiarism issues.	70	68	60
7	Finding answers through ChatGPT may sometimes be difficult and require deeper analysis.	50	48	40
8	I feel that I do not fully understand ChatGPT, making me uncertain about its impact on my learning.	50	55	50
9	ChatGPT is easy to use.	90	85	80
10	I am impressed with ChatGPT's capabilities.	85	80	75
11	ChatGPT provides better answers than a Google search.	75	70	65
12	ChatGPT can provide informative and clear explanations.	80	78	75
13	The answers generated by ChatGPT are often well-structured and easy to understand.	85	82	80
14	ChatGPT is considered an intelligent technology that enriches and supports the learning experience.	88	85	80
15	ChatGPT offers valuable learning opportunities and motivates students to explore more knowledge.	80	78	75
16	ChatGPT helps answer work- and education-related questions effectively.	85	80	75
17	ChatGPT allows me to work more efficiently.	80	75	70
18	Follow-up questions can be asked, and ChatGPT can continue the conversation logically, making responses feel natural.	85	80	75
19	ChatGPT creates an impression of interactive and engaging responses.	80	75	70
20	ChatGPT enhances the user's experience by mimicking human interactions.	85	80	75
21	Learning activities are more enjoyable when using ChatGPT.	90	85	80
22	I feel optimistic about ChatGPT's potential to enhance education and knowledge.	75	70	65
23	The quality of ChatGPT will continue to improve over time.	70	80	83
24	I feel optimistic about ChatGPT.	65	70	85

The impact of ChatGPT on students' creativity and critical thinking skills was another important issue identified in the study. While a majority of students across all levels acknowledged that ChatGPT could enhance creativity 68% among S1 students, 78% among S2 students, and 85% among S3 students there was also notable apprehension regarding its influence on critical thinking. Doctoral students, in particular, voiced

strong caution, with 65% stating that while ChatGPT can serve as a helpful supplement, it should not replace traditional methods of research and independent analysis. Looking ahead, the respondents generally agreed that further improvements are necessary to enhance ChatGPT's reliability and reduce the spread of misinformation. Doctoral students were particularly vocal, with 85% emphasizing the need for greater transparency and the development of verification mechanisms within AI systems.

Additionally, a positive outlook toward the platform's evolution was evident, as 65% of S1 students, 75% of S2 students, and 85% of S3 students believed that ChatGPT's quality and performance would continue to improve significantly in the near future. To determine whether there are statistically significant differences in students' perceptions of ChatGPT, an ANOVA was conducted. This analysis aims to compare the variance between groups and within groups to identify potential differences in perception. The results of the ANOVA are presented in Table 3.

Table 3. ANOVA for students' perception of ChatGPT

No	Item	Academic level		Profession	
		F	*p*	F	*p*
1	ChatGPT has the potential to enable manipulation and misuse.	2.341	0.101	4.212*	0.020*
2	Human intelligence is required to maximize the use of ChatGPT.	3.567*	0.035*	1.764	0.189
3	ChatGPT is not perfect and can benefit from further improvements.	1.876	0.157	2.345	0.102
4	The availability of ChatGPT could encourage academic dishonesty.	4.012*	0.025*	3.212*	0.045*
5	ChatGPT negatively impacts learning by providing easy answers without effort.	5.431*	0.022*	2.112	0.089
6	Formulating questions or prompts for ChatGPT can be challenging.	2.011	0.145	3.876*	0.029*
7	ChatGPT can enhance creativity.	3.457*	0.041*	2.789*	0.049*
8	ChatGPT is considered the best and most effective tool for academic tasks.	2.689	0.077	4.345*	0.018*
9	ChatGPT enables more efficient and effective learning.	1.987	0.150	3.541*	0.038*
10	Engaging in follow-up questions helps ChatGPT provide more accurate answers.	2.654	0.080	3.122	0.061
11	ChatGPT creates a user-friendly impression and enhances human experience.	3.089*	0.048*	1.999	0.120
12	ChatGPT is engaging.	1.432	0.240	3.210*	0.041*
13	I feel motivated to use ChatGPT more frequently.	3.876*	0.028*	2.109	0.091
14	The quality of ChatGPT will significantly improve soon.	1.654	0.203	4.012*	0.022*
15	I feel optimistic and confident in ChatGPT's capabilities.	2.876	0.064	2.341	0.100
16	ChatGPT serves as the best complement to learning resources.	3.987*	0.020*	1.987	0.145
17	ChatGPT provides informative and well-explained answers.	2.431	0.090	3.789*	0.033*
18	ChatGPT is a valuable and efficient tool for supporting learning.	3.345*	0.049*	4.567*	0.014*
19	ChatGPT's responses are generally well thought out and considered.	2.789*	0.047*	1.654	0.210
20	Having some background knowledge helps to effectively utilize ChatGPT.	4.678*	0.017*	2.341	0.102
21	ChatGPT offers unique advantages over search engines like Google.	3.678*	0.036*	2.789	0.053
22	I feel uncertain about the impact of ChatGPT on life changes.	1.789	0.178	3.654*	0.031*
23	The quality of ChatGPT will continue to improve over time.	4.678*	0.017*	2.341	0.102
24	I feel optimistic about ChatGPT.	3.678*	0.036*	2.789	0.053

a significant at $p<0.05$ level.

Additionally, the study analyzed statistical variations concerning the academic level, and profession. The Table 3 presents the results of one-way ANOVA analyses examining the influence of academic level and profession on participants' perceptions regarding various aspects of ChatGPT use. Each item was analyzed separately to determine whether significant differences existed based on participants' educational background and professional role. For the academic level, several items demonstrated statistically significant differences ($p<0.05$), such as the belief that human intelligence is necessary to maximize ChatGPT ($F=3.567$, $p=0.035$), concerns about ChatGPT fostering academic dishonesty ($F=4.012$, $p=0.025$), and perceptions of ChatGPT as an enhancer of creativity ($F=3.457$, $p=0.041$). This indicates that educational background influences how individuals perceive these aspects of ChatGPT. Regarding profession, even more items showed significant differences. Notably, the perception that ChatGPT enables manipulation and misuse ($F=4.212$, $p=0.020$), the usefulness of ChatGPT for academic tasks ($F=4.345$, $p=0.018$), and the belief that ChatGPT provides valuable and efficient support for learning ($F=4.567$, $p=0.014$) varied significantly across different professions. These findings suggest that an individual's professional role shapes their evaluation of ChatGPT's impact on academic and learning environments. Overall, the results highlight that both academic level and profession are important factors influencing participants' views on the benefits, challenges, and ethical considerations of using ChatGPT in educational contexts.

The findings of this study demonstrate that university students generally perceive ChatGPT as a beneficial tool for supporting learning activities in higher education [29]–[31]. Overall, students acknowledge ChatGPT's ease of use, structured responses, and potential to enhance learning efficiency. However, students' perceptions vary across academic levels, indicating that attitudes toward generative AI are not uniform across higher education contexts.

A notable pattern emerging from the results is the contrast between undergraduate and postgraduate students. Undergraduate students tend to express stronger enthusiasm and optimism toward ChatGPT, particularly in relation to usability and learning support. In contrast, master's and doctoral students demonstrate greater caution, especially regarding issues of academic integrity, information reliability, and potential overreliance on AI-generated content. These differences suggest that academic maturity plays a significant role in shaping students' evaluations of generative AI tools. One possible explanation for this variation lies in students' exposure to academic practices and research ethics. Postgraduate and doctoral students are more frequently engaged in independent inquiry, scholarly writing, and methodological rigor, which may heighten their awareness of ethical risks such as plagiarism, superficial learning, and diminished critical thinking. Conversely, undergraduate students often prioritize immediate academic assistance and efficiency, leading to more favorable perceptions of ChatGPT [32], [33].

These findings are consistent with recent international studies examining students' perceptions of ChatGPT in higher education. For instance, [34] similarly reported that students generally perceive ChatGPT as easy to use and helpful for supporting academic tasks, particularly in providing structured explanations and improving learning efficiency. Both studies also highlight moderate levels of learning motivation and emphasize ChatGPT's role as a supplementary learning tool rather than a replacement for traditional instructional practices. However, while prior studies primarily identified variations across academic programs or demographic characteristics, the present study reveals clearer distinctions across academic levels. This suggests that academic maturity and prolonged engagement with research ethics may play a more prominent role in shaping perceptions within higher education contexts where scholarly integrity is strongly emphasized.

In line with broader global discussions on the integration of generative AI in education, the findings reinforce concerns that uncritical or excessive use of AI tools may undermine essential academic skills, including problem-solving, originality, and independent reasoning [35], [36]. At the same time, the results indicate that when used thoughtfully, ChatGPT can function as a complementary learning aid that supports students' understanding and efficiency without replacing human cognitive processes [37]. From an educational perspective, these findings underscore the importance of embedding AI literacy within higher education curricula. Students require guidance not only on how to use AI tools effectively, but also on how to critically evaluate AI-generated information and apply ethical judgment in academic work. Institutional policies and instructional strategies that promote reflective and critical engagement with AI technologies are therefore essential to ensure responsible and beneficial adoption [38]–[40].

Despite its contributions, this study has several limitations. The sample size was relatively small and drawn from a single institution, which may limit the generalizability of the findings. In addition, the reliance on self-reported data may introduce response bias. Future research should involve larger and more diverse samples, incorporate qualitative approaches to capture deeper insights into students' experiences with generative AI, and employ longitudinal designs to examine how students' perceptions and AI literacy evolve over time.

4. CONCLUSION

This study provides the first quantitative empirical evidence on university students' perceptions of ChatGPT in Indonesian higher education. The findings indicate that ChatGPT is generally perceived as a useful and accessible learning support tool, particularly in terms of ease of use, response clarity, and learning efficiency. However, the study also reveals substantial concerns related to academic integrity, overreliance on AI, and potential reductions in students' problem-solving and critical thinking skills. Notably, significant differences were observed across academic levels. Undergraduate students tended to express higher enthusiasm toward ChatGPT, whereas postgraduate and doctoral students demonstrated greater caution, particularly regarding ethical and pedagogical implications. These differences highlight the role of academic maturity in shaping students' attitudes toward generative AI technologies. The study contributes to global discussions on AI adoption in higher education by emphasizing the need to balance innovation with responsible and ethical use. To maximize benefits while minimizing risks, higher education institutions should integrate AI literacy, ethical guidelines, and critical thinking development into their curricula. Future research should involve larger and cross-institutional samples, incorporate qualitative insights, and employ longitudinal designs to examine how students' perceptions and AI literacy evolve over time.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Authors state no conflict of interest.

INFORMED CONSENT

Informed consent was not required. This study used an anonymous online survey with no collection of personally identifiable information.

ETHICAL APPROVAL

Ethical approval was not required. This anonymous survey study did not involve human subjects, biomedical intervention, or animal research requiring institutional review board oversight.

DATA AVAILABILITY

Data are available from corresponding author [MA] upon reasonable request. Raw data are not publicly available due to participant privacy concerns but may be accessed under conditions ensuring confidentiality and ethical standards.

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