Factors Influencing Engineering Students' Perceptions on the Use of ChatGPT

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Factors Influencing Undergraduate Engineering Students' Perceptions on the Use of ChatGPT

Abstract

The language model known as Chat Generative Pre-Trained Transformer (ChatGPT) was developed by Open Artificial Intelligence engineers. It's a kind of AI system that can produce text responses to a variety of questions and prompts that seem human. ChatGPT provides a number of benefits, such as round-the-clock assistance, prompt question answering, research-related information discovery, coding program writing, etc. Notwithstanding these benefits, ChatGPT's limited contextual knowledge of a given subject may result in inaccurate or irrelevant responses. Additionally, the feedback may be unfair or erroneous due to bias in the data used to train the program. Sadly, ChatGPT has the potential to pose security risks, which could result in data breaches and the leakage of private student information.

This research project aims at understanding the factors influencing engineering students' perceptions on the use of ChatGPT. This topic is relevant, timely, and important as ChatGPT as created sufficient stir in education. By exploring factors influencing students' experiences and perspectives, we aim to shed light on different aspects of the usage of ChatGPT and glean critical insights. This research study answers the following research question, 'What factors influence the engineering students' perceptions on the use of ChatGPT?' A survey instrument was designed which included five dimensions: learning tool (10 items), trustworthiness (5 items), ethical considerations (5 items), ease of access (6 items), and concerns with ChatGPT (6 items). Additionally, the survey instrument also included demographic questions such as gender identity, race/ethnicity, current engineering academic department, and class standing. Four factors were identified by exploratory factor analysis (EFA): learning tool, trustworthiness, ease of access, and concerns with ChatGPT. Following the EFA, it was suggested that the dimension "ethical considerations" be eliminated. The range of Cronbach's alpha was 0.62 to 0.82, indicating a high degree of internal consistency reliability among the items. The statistical analysis reveals that males reported higher self-efficacy in using ChatGPT as a learning tool in comparison with other gender identities. Furthermore, Freshmen engineering students tend to have high perceptions on using ChatGPT as a learning tool, while junior engineering students have the lowest. Finally, freshmen engineering students tend to have high perceptions on ease of accessing ChatGPT, while sophomore engineering students have the lowest.

Keywords: ChatGPT, concerns with ChatGPT, ethical considerations

Introduction

Engineers working in Open Artificial Intelligence (OpenAI) developed the language model Chat Generative Pre-Trained Transformer (ChatGPT). It's a kind of artificial intelligence (AI) system that can produce text responses to a variety of questions and prompts that seem human. A process known as machine learning, which uses a sizable text dataset to train an algorithm, is how ChatGPT

was created (Azaria, 2022). The text data from books, articles, and other written language sources on the internet was used to create the algorithm for ChatGPT. This procedure, in conjunction with deep learning and natural language processing (NLP), has enabled the algorithm to learn and train linguistic patterns and become capable of producing responses that are human-like (Jiao et al., 2023).

Developers, researchers, and organizations creating services and apps requiring natural language processing (NLP) capabilities were the target audience for ChatGPT's initial design. According to George and George (2023), ChatGPT is a tool that anyone can use to communicate or find information in a natural language. It can be used for many different things, including making suggestions, responding to inquiries, creating response texts, and more. Because ChatGPT employs NLP and deep learning, the quality of responses will differ depending on the caliber of the data used to train the language model in the particular language in question (Shen et al., 2023). There are currently only a few languages available for OpenAI, including English, Spanish, French, German, Italian, Dutch, Japanese, Chinese, and Korean (Jiao et al., 2023).

Within the realm of academia and education, ChatGPT has demonstrated remarkable versatility across a wide range of applications. As is well known, one benefit of ChatGPT is that it offers students round-the-clock assistance and pertinent feedback to aid in understanding particular content (AlAfnan, 2023). Additionally, it can lessen workloads by automating teacher and student tasks like assignment grading and student feedback (Baidoo-Anu & Owusu Ansah, 2023). ChatGPT can help researchers and educators find relevant research papers, studies, and articles based on specific keywords and topics in addition to offering services to analyze large amounts of data to generate comprehensive responses not apparent through normal methods (Halaweh, 2023). Despite these benefits, ChatGPT's limited contextual knowledge of a given subject may result in inaccurate or unnecessary responses. Additionally, the data that was supplied to train the program may have been biased, which could easily result in feedback that is perceived as unfair or erroneous (Borji, 2023). Unfortunately, ChatGPT may present security risks that could result in data breaches and the leakage of student sensitive information (Nair, Sadhukhan, & Mukhopadhyay, 2023). Like any other online resource, ChatGPT is becoming more and more popular, but relying too much on it could have negative effects on students' ability to think critically and solve problems on their own in an academic setting (Shen et al., 2023).

Right now, ChatGPT is a hot topic for conversation everywhere, and research on the subject is accelerating rapidly. A number of recently published research articles (George & George, 2023; Kung et al., 2023; Lund & Wang, 2023; Shen et al., 2023; van Dis et al., 2023) provide a basic description of the ChatGPT's operation, effects on academia, and performance. The present study aims to investigate the factors that impact the use of ChatGPT in engineering by means of the perspectives of the students.

Literature Review

The increasing interest in natural language processing (NLP) and artificial intelligence (AI) technologies is reflected in the abundance of research conducted on Chat Generative Pre-Trained Transformer (ChatGPT) in recent years. ChatGPT, which was first created by engineers at Open

Artificial Intelligence (OpenAI), has attracted interest from a wide range of academic fields. Research has concentrated on its uses, drawbacks, and implications for different fields. The goal of this review of the literature is to examine ChatGPT research conducted in engineering as well as in a wider context. It also attempts to analyze and assess how students perceive this transformative tool, with a focus on the approaches employed—most notably, the use of survey tools.

There is a broad range of research being done on ChatGPT, including studies of its capabilities, architecture, and social impact. Early research frequently focused on ChatGPT's technical features, discussing its underlying mechanisms and the effectiveness of its language generation algorithms. For example, Azaria (2022) shed light on ChatGPT's training data and model architecture and offered insights into the machine learning processes that support ChatGPT's operation. Beyond technical details, additional research examined ChatGPT's useful applications in a variety of fields. Research has demonstrated its ability to support tasks related to content generation, enhance customer service, and facilitate human-computer interaction. In their investigation of ChatGPT's application in customer service contexts, Kung et al. (2023) brought up clinical decision-making in particular, highlighting the technology's capacity to improve user satisfaction and expedite communication. Investigations into ChatGPT's social implications have also brought up sociocultural and ethical issues. Academics have examined concerns about fairness, bias, and privacy in content generated by ChatGPT. The existence of biases in ChatGPT responses was examined by Borji (2023), who emphasized the necessity of addressing algorithmic injustices and mitigating strategies to address such issues.

ChatGPT has become a promising tool for improving learning outcomes and promoting open access to knowledge in the field of engineering education. Research has looked into how useful it is for helping students with their homework, offering support in real time, and automating some tasks. Lund and Wang (2023) carried out an extensive examination of ChatGPT's educational applications, emphasizing its capacity to help students with concept clarification and problem-solving. In order to improve student learning outcomes, the study investigated the significance of incorporating ChatGPT into instructional strategies. Additionally, studies on students' opinions of ChatGPT in engineering classrooms have become more popular. Survey instruments have been employed by researchers to assess students' perceptions and apprehensions concerning the incorporation of ChatGPT into the educational setting. AlAfnan (2023) created a survey-based methodology to investigate how students used ChatGPT in a range of coursework. The study evaluated a number of factors, such as accessibility, value as a teaching tool, and privacy and dependability concerns. In a similar vein, Halaweh (2023) carried out a survey to investigate how students saw ChatGPT's assistance with coding assignments and research questions in engineering courses. The study's conclusions centered on students' opinions of ChatGPT, both favorable and unfavorable.

To sum up, there is a wide range of research being done on ChatGPT, covering everything from socio-cultural implications to technical details. Survey-based research in engineering education has yielded rich insights into students' views on the subject, paving the way for technological interventions meant to improve student performance. Additional research in this area will clarify

ChatGPT's transformative potential and its implications for engineering education as the field develops. An attempt is made in this research study to examine the factors influencing undergraduate engineering students' perceptions on the use of ChatGPT characterized by dimensions like learning tool efficacy, trustworthiness, ease of access, and concerns with ChatGPT. This survey instrument will contribute to the ongoing discussion about the incorporation of AI technologies in engineering education and provide insightful information about the viewpoints of the students and factors that influence those viewpoints.

Methods

The data for this study comes from a parallel project (Sajawal & Kittur, 2024) in which a detailed description design and development of the survey instrument is presented. The survey instrument was designed to include five scales: learning tool, trustworthiness, ethical considerations, ease of access, and concerns with ChatGPT (Sajawal & Kittur, 2024). The scales, the definition of each of the scales and the example items are shown in Table 1. As a part of this project, one other study has been conducted using the collected data to examining students' beliefs on the use of ChatGPT in engineering (Sajawal & Kittur, 2024).

Table 1. Overview of Scales within the Instrument (Sajawal & Kittur, 2024)

Scale (# of items)	Definition	Example Items
Learning Tool (10)	Students' perceptions on the use of ChatGPT as a learning tool in doing homework, completing assignments, projects, etc.	- ChatGPT can be used to write essays - ChatGPT can be used to expand general knowledge
Trustworthiness (5)	Students' perceptions on the relevancy, accuracy, and trustworthiness of the information retrieved from ChatGPT.	- The information retrieved from ChatGPT is accurate - The ChatGPT's response to questions is relevant
Ethical Considerations (5)	Students' perceptions regarding using the information retrieved from ChatGPT through the ethical lens.	- It is ethical to use ChatGPT to find solutions to exams - Using ChatGPT to complete academic work is a violation of ethics
Ease of Access (6)	Students' perceptions regarding the ease of accessibility of ChatGPT to look up for answers/solutions and find the required information.	- It is easy to access information from ChatGPT - It is easy to find answers from ChatGPT
Concerns with ChatGPT (6)	Students' perceptions regarding the concerns/issues with the use of ChatGPT	- ChatGPT hinders critical thinking - ChatGPT can generate incorrect or misleading information, leading to academic errors

From the study (Sajawal & Kittur, 2024), four factors were identified by exploratory factor analysis (EFA): learning tool, trustworthiness, ease of access, and concerns with ChatGPT. Building further on this study, to understand the different factors that influence undergraduate engineering students' perceptions on the use of ChatGPT t-test and one-way ANOVA analyses were conducted (Kittur, 2023). Independent samples t-test was conducted to understand the

influence of gender identity on the four different scales of the survey instrument. Additionally, one-way ANOVA analyses was conducted to examine the impact of class standing and engineering majors on the four scales of the survey instrument.

Results

Table 2 shows the participants' demographic information. A total of 233 participant responses were included in the analysis. Approximately 59% of the final sample were men and 34% were women. The participants self-identified as American Indian or Alaskan native (6.87 percent), Black or African American (5.58 percent), Asian (18.88 percent), Hispanic or Latinx (14.59 percent), and White (67.81 percent). The respondents belonged to twelve different engineering majors and were approximately uniformly distributed across the class standing: freshmen (25.32 percent), sophomore (30.9 percent), junior (21.46 percent), and senior (22.32 percent).

Table 2. Demographic information of the participants

Category	Undergraduate students	
	N	%
Total	233	100
Gender		
Male	137	58.79
Female	79	33.91
Others	16	6.87
Race/Ethnicity		
White	158	67.81
Asian	44	18.88
Hispanic or LatinX	34	14.59
Black or African American	13	5.58
American Indian or Alaska Native	16	6.87
Native Hawaiian or Other Pacific Islander	2	0.86
Academic Department		
Computer Science	31	13.30
Mechanical Engineering	44	18.88
Electrical and Computer Engineering	22	9.44
Biomedical Engineering	49	21.03
Aeronautical Engineering	35	15.02
Civil Engineering	8	3.43
Industrial and Systems Engineering	6	2.58
Chemical Engineering	6	2.58
Aerospace Engineering	9	3.86
Environmental Engineering	15	6.44
Architectural Engineering	6	2.58
Engineering Physics	1	0.43
Engineering Undecided	1	0.43
Class Standing		
First year	59	25.32
Second year	72	30.90
Third year	50	21.46
Fourth year	52	22.32

Seltman (2013) states that when the absolute values of skewness and kurtosis for each of the 32 survey items were less than 3.0, an acceptable limit was reached (see Appendix A). Based on the average response ratings (greater than 4.0 out of 5.0), it can be inferred that students felt confident using ChatGPT for the following purposes: finding answers to questions (mean = 4.02), brainstorming ideas (mean = 4.44), rephrasing and re-writing sentences or paragraphs (mean = 4.12), expanding general knowledge (mean = 4.2), it is a good idea to rewrite the information retrieved from ChatGPT in our own words (mean = 4.17), ChatGPT is simple to use (mean = 4.27), ChatGPT responds to questions quickly (mean = 4.3), and ChatGPT can generate inaccurate or misleading information that could lead to academic errors (mean = 4.4). However, based on the average response ratings (lower than 3.0 out of 5.0), the areas in which students expressed comparatively less confidence in using ChatGPT include Research papers can be written using ChatGPT (mean=2.99), questions can be used directly from ChatGPT responses (mean=1.79), ChatGPT offers answers to all questions (2.13), and using ChatGPT to find exam solutions is morally acceptable (mean=2.27).

The factor loadings of the final factor structure are shown in Table 3 (Sajawal & Kittur, 2024). The loadings for the first factor (F1), second factor (F2), third factor (F3), and fourth factor (F4) were as follows: 0.6 to 0.69 for the first factor, 0.48 to 0.49 for the second factor, and 0.66 to 0.78 for the fourth factor. Cronbach's α indicated that the internal consistency of the four factors varied from 0.62 to 0.82, indicating good reliability.

Table 3. Factor loadings of the survey item structure (Sajawal & Kittur, 2024)

#	Items	F1	F2	F3	F4
	Learning tool (*Cronbach's α = 0.79*)				
1	ChatGPT can be used to write essays	0.61			
3	ChatGPT can be used to complete assignments	0.69			
7	ChatGPT can be used to find solutions to exams	0.60			
8	ChatGPT can be used to write research papers	0.62			
	Trustworthiness (*Cronbach's α = 0.57*)				
11	The information retrieved from ChatGPT is accurate		0.49		
12	The ChatGPT's response to questions is relevant		0.48		
14	ChatGPT provides adequate information as requested		0.48		
	Ease of access (*Cronbach's α = 0.57*)				
22	It is easy to find answers from ChatGPT			0.58	
23	ChatGPT is easy to use			0.57	
25	ChatGPT responds quickly to questions			0.48	
	Concern with ChatGPT (*Cronbach's α = 0.82*)				
27	ChatGPT hampers creativity				0.76
28	ChatGPT hinders critical thinking				0.78
29	ChatGPT negatively influences writing skills				0.66

Note. F1 = Learning tool, F2 = Trustworthiness, F3 = Ease of access, F4 = Concern with ChatGPT

_t_-test and One-way ANOVA analyses

In this study, the _t_-test and one-way ANOVA analyses were performed considering only the undergraduate students' data. The scores on each factor were calculated by averaging the response scores of all the items that were categorized under the factor. For example, the first factor's (learning tool) score was calculated by averaging the response scores of items 1, 3, 7, and 8 (refer Table 4).

t-test – gender identity

Gender identity of undergraduate engineering students significantly influenced only the first factor 'learning tool'. Males reported higher confidence in using ChatGPT as a learning tool in comparison with other gender identities.

There was a statistically significant effect for gender identity in the 'learning tool' factor, $t(231)=1.722$, $p=0.043$. The male participants reported higher self-efficacy in using ChatGPT as a 'learning tool' ($M=3.41$, $SD=0.9$) in comparison with other gender identities ($M=3.18$, $SD=1.04$).

There was no significant effect for gender identity in the 'trustworthiness' factor, $t(231)=0.837$, $p=0.404$, despite male participants reported relatively higher trustworthiness in using ChatGPT ($M=3.73$, $SD=0.61$) in comparison with other gender identities ($M=3.66$, $SD=0.67$).

There was no significant effect for gender identity in the 'ease of access' factor, $t(231)=0.949$, $p=0.343$, despite male participants reported relatively higher self-efficacy in the ease of access of using ChatGPT ($M=4.12$, $SD=0.59$) in comparison with other gender identities ($M=4.05$, $SD=0.56$).

There was no significant effect for gender identity in the 'concerns with ChatGPT' factor, $t(231)=-1.63$, $p=0.053$, despite male participants reported relatively lower concerns using ChatGPT ($M=3.14$, $SD=1.13$) in comparison with other gender identities ($M=3.38$, $SD=1.09$).

One-way ANOVA – class standing

Across the four factors only 'learning tool' and 'ease of access', were influenced by undergraduate engineering students' class standing. Freshmen engineering students reported higher confidence in using ChatGPT as a learning tool and ease of accessing ChatGPT.

There was a statistically significant difference in the means across the class standing levels on students' perceptions on using ChatGPT as a learning tool ($p=0.038$). The effect size (eta squared=0.04) is medium. The post-hoc tests reveal a statistically significant difference ($p=0.023$) in students' perceptions of using ChatGPT as a learning tool at freshmen and junior levels. Freshmen engineering students tend to have high ($M=3.57$, $SD=0.9$) perceptions on using ChatGPT as a learning tool, while junior engineering students have the lowest ($M=3.01$, $SD=1.1$).

There was no significant difference in the means across the class standing levels on students' perceptions on the trustworthiness of using ChatGPT ($p=0.077$), despite freshmen engineering students expressing higher ($M=3.83$, $SD=0.49$) trust and junior engineering students the least ($M=3.55$, $SD=0.72$).

There was a statistically significant (marginal) difference in the means across the class standing levels on students' perceptions on the ease of accessing ChatGPT ($p=0.05$). The effect size (eta squared=0.03) is medium. The post-hoc tests reveal a statistically significant difference ($p=0.048$) in students' perceptions on ease of accessing ChatGPT at freshmen and sophomore levels. Freshmen engineering students tend to have high ($M=4.23$, $SD=0.51$) perceptions on ease of accessing ChatGPT, while sophomore engineering students have the lowest ($M=3.96$, $SD=0.72$).

There was no significant difference in the means across the class standing levels on students' perceptions on concerns with ChatGPT ($p=0.469$), despite freshmen engineering students expressing higher ($M=3.4$, $SD=1.03$) concerns and sophomore engineering students the least ($M=3.12$, $SD=1.15$).

One-way ANOVA – engineering major

Across the four factors: learning tool, trustworthiness, ease of access, and concerns with ChatGPT, there was no significant differences in students' perceptions of using ChatGPT across different engineering majors.

There was no significant difference in the means across the engineering majors on students' perceptions of using ChatGPT as a learning tool ($p=0.746$), despite aeronautical engineering students expressing higher ($M=3.41$, $SD=0.95$) perceptions on using ChatGPT as a learning tool and electrical and computer engineering students the least ($M=3.05$, $SD=1.2$).

There was no significant difference in the means across the engineering majors on students' perceptions on the trustworthiness of using ChatGPT ($p=0.555$), despite biomedical engineering students expressing higher ($M=3.79$, $SD=0.63$) trust and aeronautical engineering students the least ($M=3.58$, $SD=0.81$).

There was no significant difference in the means across the engineering majors on students' perceptions on the ease of accessing ChatGPT ($p=0.84$), despite electrical and computer engineering students expressing higher ($M=4.18$, $SD=0.48$) perceptions on the ease of accessing ChatGPT and mechanical engineering students the least ($M=4.04$, $SD=0.71$).

There was no significant difference in the means across the engineering majors on students' perceptions on concerns with ChatGPT ($p=0.455$), despite freshmen engineering students expressing higher ($M=3.54$, $SD=1.05$) concerns and other engineering students the least ($M=3.07$, $SD=1.09$).

Conclusions and Implications

The main goal of this study was to determine the factors influencing undergraduate engineering students' perceptions on the use of ChatGPT. Four factors: learning tool, trustworthiness, ease of access, and concerns with ChatGPT were used in this study. *t*-test and one-way ANOVA analyses were used to finding the factors influencing undergraduate engineering students' perceptions on the use of ChatGPT. The study results revealed that (1) males reported higher confidence in using ChatGPT as a learning tool in comparison with other gender identities, (2) freshmen engineering students reported higher confidence in using ChatGPT as a learning tool and ease of accessing ChatGPT, and (3) no significant differences in students' perceptions on using ChatGPT across different engineering majors.

The factors 'learning tool' and 'ease of access', were influenced by undergraduate engineering students' class standing. This finding aligns with a study, (Ngo, 2023) where students' perceptions on using ChatGPT as a learning tool and its ease of access have been resulted to have the highest mean scores. Numerous researchers have acknowledged these features of ChatGPT (Aljanabi et al., 2023; Farhi et al., 2023; García-Peñalvo, 2023; Kasneci et al., 2023). The trustworthiness and concerns with ChatGPT scales had one of the lowest response scores from the undergraduate engineering students in comparison with the other factors. This finding is similar to the recently published literature (Farhi et al., 2023; Ngo, 2023; Shoufan, 2023). In these studies, the researchers reveal that students report that they fear the inaccuracy of ChatGPT responses and requires a thorough review of the ChatGPT responses before they can be used to learn a concept, write an essay, etc.

This research study offers several implications. This survey instrument can be used by instructors and/or universities to assess their students' perceptions on using ChatGPT to draw useful insights that can inform the policy and guidelines on using ChatGPT in their classroom and/or intuition. This study also offers implications for students to understand the concerns associated with ChatGPT such as inaccuracy in the information retrieved from ChatGPT, trustworthiness of the tool, ethical considerations, etc.

Limitations and Future Work

This study has some limitations like all other studies. The data collected is not representative as the respondents are from a single university. The sample includes only undergraduate engineering students. The data collected has limitations in explaining the reasons for why males and freshmen engineering students reported higher self-efficacy on using ChatGPT. Researchers can build on the findings from this study to explore the reasons for 'why' behind the findings. Specifically, reasons for males reporting higher self-efficacy in using ChatGPT as a learning tool in comparison with other gender identities. Another potential direction for future research is to investigate the reasons for higher self-efficacy of freshmen engineering students in using ChatGPT in comparison with other the sophomores, juniors, and seniors. Also, examining how students across different engineering majors perceive the use of ChatGPT could be an interesting addition to the existing body of literature.

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Appendix

Appendix A. Descriptive Statistics of Survey Items ((Sajawal & Kittur, 2024))

#	Measure	Mean	SD	Skew	Kurtosis
	Learning tool				
1	ChatGPT can be used to write essays	3.51	1.20	-0.89	-0.43
2	ChatGPT can be used to write a software code/logic	3.93	0.96	-1.45	1.91
3	ChatGPT can be used to complete assignments	3.62	1.12	-0.96	-0.15
4	ChatGPT can be used to find answers to questions	4.02	0.83	-1.61	2.39
5	ChatGPT can be used to find information for project work	3.95	0.92	-1.50	2.32
6	ChatGPT can be used to brainstorm ideas	4.44	0.71	-2.01	2.71
7	ChatGPT can be used to find solutions to exams	3.25	1.27	-0.59	-1.09
8	ChatGPT can be used to write research papers	2.99	1.37	-0.28	-1.48
9	ChatGPT can be used to rephrase/re-write a sentence/paragraph	4.12	0.89	-1.59	2.92
10	ChatGPT can be used to expand general knowledge	4.20	0.84	-1.70	2.90
	Trustworthiness				
11	The information retrieved from ChatGPT is accurate	3.41	1.01	-1.06	-0.44
12	The ChatGPT's response to questions is relevant	3.93	0.65	-2.31	2.39
13	The ChatGPT's response to questions can be used without reviewing it	1.79	1.08	1.34	0.62
14	ChatGPT provides adequate information as requested	3.68	0.92	-1.50	1.42
15	ChatGPT provides answers to all questions	2.13	1.17	0.77	-0.79
	Ethical considerations				
16	It is acceptable to use the responses from ChatGPT to write essays	3.54	1.27	-0.57	-1.03
17	It is ethical to use ChatGPT to find solutions to exams	2.27	1.26	0.58	-1.17
18	It is a good practice to re-write the information retrieved from ChatGPT in our own words	4.17	0.90	-1.52	2.44
19	Using ChatGPT to complete academic work is a violation of ethics	3.44	1.29	-0.59	-0.99
20	ChatGPT should be integrated into academic integrity policies	3.83	1.04	-1.26	0.96
	Ease of access				
21	It is easy to access information from ChatGPT	3.85	1.05	-1.31	1.12
22	It is easy to find answers from ChatGPT	3.73	0.94	-1.18	0.66
23	ChatGPT is easy to use	4.27	0.70	-1.40	2.66
24	ChatGPT supports multiple languages, aiding in international academic collaboration	3.95	0.68	-2.17	2.84
25	ChatGPT responds quickly to questions	4.30	0.67	-1.49	2.97
26	ChatGPT respects user privacy by protecting personal data	3.39	1.14	-1.08	-0.31
	Concern with ChatGPT				
27	ChatGPT hampers creativity	3.17	1.31	-0.20	-1.39
28	ChatGPT hinders critical thinking	3.22	1.27	-0.27	-1.34
29	ChatGPT negatively influences writing skills	3.29	1.29	-0.34	-1.29
30	ChatGPT is limited in providing personalized feedback or tailored individual guidance	3.70	1.04	-1.12	0.41
31	ChatGPT can generate incorrect/misleading information, leading to academic errors	4.40	0.67	-1.48	2.22

| 32 | ChatGPT's responses may perpetuate discriminatory or exclusionary narratives in academic settings. | 3.37 | 1.17 | -0.74 | -0.78 |

Note. *N*=233, all items were rated on five-point scales