RESEARCH ARTICLE

From the Gender Lens: Student Perceptions of ChatGPT in Higher Education

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Abstract: The development of artificial intelligence (AI) technologies, such as ChatGPT, has significantly impacted education. Our study adds a gender lens to this discourse by examining how male and female students in Indonesian higher education perceive ChatGPT differently. ChatGPT, trained on human conversation data, provides human-like responses, enhancing interactivity and learning effectiveness in higher education. This study examines university students' perspectives from Indonesia and the use of ChatGPT in learning, involving 250 participants (109 males, 43.6%; 141 females, 56.4%). The findings reveal that males found ChatGPT more effective for interacting, searching, evaluating, and managing information, and they exhibited more positive attitudes and satisfaction toward its use. Additionally, males perceived ChatGPT as contributing more to their learning experience, particularly in daily classes and practical subjects. In contrast, females found ChatGPT more helpful for theoretical assignments and homework. These results highlight significant gender differences in ChatGPT's perceived benefits, underscoring the need to consider gender-specific preferences in educational technology implementation. This study provides insights into integrating ChatGPT effectively in education and emphasizes the importance of developing inclusive and adaptive AI-driven learning tools. Further research is needed to explore underlying factors influencing these differences and to design more equitable solutions for all students.

Keywords: ChatGPT, gender lens, attitude and satisfaction, user experience, higher education

1   Introduction

The rapid development of technology has had a significant impact on various sectors, including education, by improving the efficiency and effectiveness of activities. However, gender disparities in technology adoption remain underexplored, particularly for AI tools like ChatGPT in non-Western contexts. One of the leading innovations in this era is AI, which has experienced rapid growth and great influence in the field of education (Akgun & Greenhow, 2022; Alam, 2022; Zhang & Aslan, 2021). This growth highlights the educational potential of AI technologies and social robots in enhancing learning processes and environments (Lampropoulos & Papadakis, 2025). AI can simulate intelligent human behaviors, including analysis, inference, and decision-making (Hwang et al., 2020). Consequently, it has become an important factor in the transformation of education (Foroughi et al., 2023; Hsu et al., 2023; Lo et al., 2024). One of the most discussed applications of AI in education is ChatGPT, which was launched in November 2022 by OpenAI (Lo, 2023). ChatGPT rapidly gained popularity and became the fastest-growing app in history, with over one hundred million users in its first two months (Milmo, 2023).

Developed based on large language models trained using human conversation datasets, ChatGPT is capable of performing complex tasks and generating human-like responses (Haque et al., 2022). Its natural language processing capabilities allow it to predict words or phrases and generate sophisticated responses to various questions or instructions (Farrokhnia et al., 2023). These advantages make ChatGPT a potential tool for enhancing the learning experience through interactive and innovative learning methodologies (Al Shloul et al., 2024; Fadillah, Usmeldi, & Asrizal, 2024; Festiyed et al., 2024), thereby improving higher education teaching and learning (Adiguzel et al., 2023; Baidoo-Anu & Ansah, 2023; Onal & Kulavuz-Onal, 2024). However, as with any technological innovation, the use of ChatGPT also raises several concerns regarding its potential misuse, such as an increase in academic cheating and plagiarism (Cotton et al., 2024), thus presenting challenges to the academic community in any university education

(Teubner et al., 2023). Others have advocated for an outright ban due to concerns over the risk of ChatGPT being misused in education (Cai et al., 2023; Hsu, 2023) and research (Farrokhnia et al., 2023). Although some academics are concerned about its use, ChatGPT has also received positive responses because it can optimize teaching and learning if applied carefully (Mai et al., 2024), so students should be equipped with the skills and ethical mindset needed to operate in AI environments (Strzelecki, 2023; 2024). Moreover, students' intentions to adopt AI tools in academic contexts are influenced by several determinants, particularly within the humanities and social sciences (Lavidas et al., 2024).

Despite its debatable concerns, ChatGPT is currently in the research and development stage, for example, GPT-4, offering better response times and prioritized access to upgrades and new features (Kocoń et al., 2023; Peters et al., 2023). Several studies have explored the use of ChatGPT in education. For example, ChatGPT can provide ease of interaction, including how easy ChatGPT is to use to seek information, ask questions, and receive relevant answers (Castillo et al., 2023; Grassini, 2023; Rahman & Watanobe, 2023). ChatGPT also provides a positive attitude and satisfaction towards users, such as how they feel about the interface, responsiveness, and how well ChatGPT meets their expectations in the context of learning—user attitude and satisfaction (Qu & Wu, 2024; Shao & Xia, 2023; Yu et al., 2024). ChatGPT also provides general benefits, such as making activities easier (Benvenuti et al., 2023; Pradana et al., 2023). ChatGPT also provides academic benefits for students, such as improved understanding of the material, assistance in completing academic tasks, and contribution to their learning outcomes and academic benefits (Chan & Hu, 2023; Fadillah et al., 2024; Khlaif et al., 2023).

Although ChatGPT is rapidly gaining popularity for its benefits in education, research on how it is understood and utilized by university students from a gender perspective is scarce. This shortcoming is important because understanding how college students, both male and female, interact with AI assistance is crucial for its effective application in educational contexts (Strzelecki, 2024). Although (Raman et al., 2024) and (Yilmaz et al., 2023) have begun this exploration, their studies focused on perceived ease of use only and did not extend explicitly to academic usefulness. As a result, there is an urgent and pressing need to explore ChatGPT from a gendered view to ensure the appropriateness of AI applications in educational settings and articulate overarching principles and guidelines for ethical utilization (Hahn et al., 2021). Therefore, a deeper understanding of how ChatGPT is understood and utilized from a gender perspective is needed, especially their perceptions of ease of interaction and information access, user attitudes and satisfaction, general benefits, and academic benefits.

With these four main factors in mind, this research seeks to fill the literature gap by examining how male and female students perceive and use ChatGPT. By closing this research gap, perspectives on how best to incorporate ChatGPT into the structure of the education system will be clearer to facilitate student learning to support their academic success. Thus, the research questions for this study are:

(1) RQ1: How do males and females perceive the ease of interaction and information access of ChatGPT as a learning tool?

(2) RQ2: How do males and females perceive the user attitude and satisfaction of ChatGPT in assisting their learning?

(3) RQ3: How do males and females perceive the general usefulness of ChatGPT in assisting their learning?

(4) RQ4: How do males and females perceive the academic benefits of ChatGPT in assisting their learning?

2 Literature Review

The use of ChatGPT in higher education is gaining attention because of its ability to enrich students' learning experience through its ability to respond to user requests and produce highly original output (Chan & Hu, 2023). ChatGPT allows users to easily interact and solve problems through a chatbot that can speak up to an advanced conversational level through text and voice (Pérez et al., 2020). One of the main applications of ChatGPT in higher education is to enhance the student learning experience by responding to user requests to produce highly original output. For example, ChatGPT, in the form of a text-to-text generator, assists college students in writing, especially for those who are not native English speakers, by allowing them to exchange ideas and receive feedback on their writing (Atlas, 2023; Chan & Lee, 2023). In addition to its use in learning, ChatGPT is also beneficial in research contexts by assisting researchers in generating ideas, synthesizing information, and summarizing large amounts of text data to analyze data and structure writing (Farrokhnia et al., 2023). The tool also has the potential to increase efficiency

in scientific publications (Kitamura, 2023; van Dis et al., 2023). Regarding learning assessment, ChatGPT can automatically evaluate student written work through tools such as the Intelligent Essay Assessor, which provides consistent and immediate feedback on student performance (Mizumoto & Eguchi, 2023). The results showed that ChatGPT can shorten assessment time and help maintain consistency in assessing student writing quality.

The use of ChatGPT in higher education promises to transform teaching and learning and improve student learning outcomes by leveraging technology's ability to provide personalized, responsive, and efficient learning support. Nonetheless, there is still a need to assess how male and female students perceive and use ChatGPT. From a gender perspective, (Liff et al. (2004) provide an important conceptual framework for understanding how gender gaps manifest in the context of technology access and use. Liff et al. identify four main dimensions that influence the gender gap in internet access: technical access, ability to use access, acceptance of access, and impact. Recent studies by Strzelecki (2024) and Raman et al. (2024) extend this framework to AI tools like ChatGPT, highlighting persistent gender differences in perceived ease of use and benefits. These dimensions pave the way for exploring gender differences in access and use of technologies such as ChatGPT, focusing on the ease of interaction and information access, user attitudes and satisfaction, and its general and academic benefits.

ChatGPT makes a significant contribution through its ease of interaction and information access. As a chatbot that can interact through text and voice, ChatGPT allows users to quickly get solutions to their problems (Pérez et al., 2020). Its ability to explain complex concepts and support an in-depth understanding of the subject matter makes it a valuable tool for students in their learning process (Montenegro-Rueda et al., 2023). However, in the context of gender-based technology access, there are significant differences. Liff et al. (2004) showed that males generally have better access to high-connectivity devices than women, who often experience limitations in such access. In addition, a recent study by Raman et al. (2024) highlighted differences in perceptions of ChatGPT between male and female university students. Male students tended to see ChatGPT as an easy-to-observe and understand tool for everyday use. In contrast, female students were more interested in ChatGPT's ability to support deeper exploration and use of technology.

Students generally responded positively to the use of ChatGPT in the context of their learning process. This technology is considered a very useful tool as it can explain complex concepts more easily and helps complete academic tasks more efficiently (Foroughi et al., 2023; Singh et al., 2023). Thus, the use of ChatGPT significantly enhanced their overall learning experience. A key advantage of ChatGPT is its ability to provide instant access to information and quick feedback. It is particularly advantageous in learning contexts where students often need immediate help understanding material or completing assignments. In addition, this technology also facilitates more personalized and in-depth interactions between users and the system, creating a more responsive and adaptive learning environment (Ngo, 2023). However, it should be noted that from a gender perspective, differences may affect how students perceive and use ChatGPT. Research by Hargittai & Hinnant (2008) suggests that women, despite having technical skills equivalent to men's, often feel less confident in their use of technology. This finding is supported by the study of (Yeh et al., 2021), which states that males have a higher level of confidence in AI knowledge than women. It is also understandable that males are identified as more proactive in using new technologies (Goswami & Dutta, 2016). In addition, Yilmaz et al. (2023) found that the perceived ease of use of ChatGPT can differ significantly between male and female college students, which most likely affects their level of satisfaction in using this technology for learning.

ChatGPT offers a range of highly beneficial features supporting learning across various educational contexts. One of its key advantages is providing clear language input and rapid feedback and conducting formative assessments efficiently (Giordano et al., 2024). In addition, ChatGPT is also capable of answering various types of tasks, ranging from summarization, text, classification, and information extraction to brainstorming, which is very helpful in facilitating the teaching and learning process (Cai et al., 2023). In its context of use, ChatGPT has been shown to positively contribute to increasing student achievement, increasing self-efficacy in learning, and improving learning attitudes and motivation (Essel et al., 2022; Lee et al., 2022). Studies also show that in business education, students respond positively to interactions with chatbots, appreciating the quick responses, interactivity, and support in understanding the subject matter (Chen et al., 2023).

Nonetheless, within the gender lens, there are significant differences in how males and females perceive the general and academic benefits of technologies such as ChatGPT. Several

studies have shown that females estimate the impact of AI to be greater (Yeh et al., 2021) and automated decision-making by AI to be less beneficial than males (Araujo et al., 2020). Meanwhile, males show more positive attitudes towards using robots and AI than women (Lozano et al., 2021).

3 Methodology

This study used a survey design to collect data from university students in Indonesia to explore their use and perceptions of ChatGPT. While ANOVA could test group differences, our descriptive approach aligns with similar perceptual studies (Yilmaz et al., 2023) and directly answers our research questions about gender-based perceptions. The survey included four main factors adopted from previous research: ease of interaction and information access (Castillo et al., 2023; Grassini, 2023; Rahman & Watanobe, 2023), user attitude and satisfaction (Qu & Wu, 2024; Yu et al., 2024), general benefits (Benvenuti et al., 2023; Pradana et al., 2023), and academic benefits (Chan & Hu, 2023; Khlaif et al., 2023). The use of a 5-point Likert scale, which ranges from "Strongly agree" to "Strongly disagree," allowed the respondents to express their opinions easily and accurately (Taherdoost, 2022).

The survey was distributed online, with participants recruited through various social media platforms and student forums. Before completing the survey, participants were informed of the purpose of the study and asked to fill out a consent form. This process ensured their participation was voluntary and their responses remained anonymous. It was important to maintain the integrity and ethics of the research while ensuring that the data collected was representative and reliable.

Table 1 in this study displays the confirmatory factor analysis of each measurement item. These results include factor loadings, Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE). All these values meet the thresholds recommended in the academic literature (Dash & Paul, 2021; Hair et al., 2021). Thus, the reliability and validity of the data have been verified, ensuring the credibility of the measurement scale used in this study. It suggests that the instruments used are reliable for measuring university students' perception and use of ChatGPT.

Table 1 Measurements

Factors	Codes	Items	Loadings	CA	CR	AVE
Ease of Interaction and Access to Information	A1	Interaction with ChatGPT is easy and understandable	0.821	0.817	0.891	0.732
	A2	Easily search, evaluate, and select study materials through ChatGPT	0.896			
	A3	Easy to access and control information obtained through ChatGPT	0.849			
User Attitude and Satisfaction	B1	Using ChatGPT for learning is considered a good idea	0.868	0.891	0.933	0.822
	B2	Happy to use ChatGPT for learning	0.928			
	B3	Enjoy using ChatGPT for learning	0.923			
General Benefits	C1	Satisfied with much important information from ChatGPT	0.864	0.894	0.927	0.759
	C2	Satisfied with the benefits that ChatGPT provides	0.884			
	C3	Happy with ChatGPT's contribution to learning	0.900			
	C4	ChatGPT contributes effectively to the acquisition of new information	0.837			
Academic Benefits	D1	ChatGPT improves daily class contributions	0.839	0.857	0.903	0.700
	D2	ChatGPT improves understanding of practical subjects	0.861			
	D3	ChatGPT assists in theory assignments and homework	0.822			
	D4	ChatGPT enables integration of theoretical studies with practical experience	0.824			

The convenience sampling method was used in this study to select respondents based on their availability and willingness to participate. This non-probability sampling method was chosen due to the vast number, diversity, and geographical dispersion of universities across Indonesia, making it challenging to apply a representative sampling approach (Etikan, 2016). While this approach allowed efficient data collection, the sample may not fully represent all student demographics across disciplines and regions. Future studies could enhance generalizability by using stratified random sampling to ensure proportional representation of gender, faculties, and academic levels. As presented in Table 2, a total of 250 students participated in this study, consisting of 109 males (43.6%) and 141 females (56.4%). They came from various faculties in the university in Indonesia, including faculties of science (82.8%), education (9.2%), engineering (2%), languages and arts (0.8%), and social sciences (5.2%). Most participants were undergraduates (88%), while the rest were graduate students (12%). Interestingly, all participants reported being ChatGPT users (100%).

There were no incomplete or duplicated responses, so all data collected could be used in the analysis. The data was analyzed using SPSS version 22 software to obtain a description of the survey data. This analysis included various descriptive statistics to understand the distribution and characteristics of the data collected. Through this analysis, we identified trends and patterns in student usage and perceptions of ChatGPT from a gender perspective, providing greater insight into the impact and benefits of using this technology in an academic context.

Table 2 Demographic Information

Criteria	Aspects	Frequency	Percentage (%)
Gender	Male	109	43.6
	Female	141	56.4
Academic level	Undergraduate	220	88.0
	Postgraduate	30	12.0
Faculty	Science	207	82.8
	Education	23	9.2
	Engineering	5	2.0
	Language and Arts	2	0.8
	Social sciences	13	5.2
Are you a ChatGPT user?	Yes	250	100.0
	No	0	0.0

4   Results and Discussion

This study aimed to explore the views and use of ChatGPT by male and female university students. Of the 250 students who participated, 109 were male (43.6%) and 141 were female (56.4%). The main findings of this study include several important aspects, such as ease of interaction, user attitude and satisfaction, general benefits, and academic benefits of using ChatGPT.

4.1   Ease of interaction and access to information

Figure 1 shows that males and females generally felt that interaction with ChatGPT was easy and the information obtained was well accessible. However, males (Mean = 4.21, SD = 0.681) found interacting with and understanding ChatGPT easier than females (Mean = 4.04, SD = 0.797). It was also true in searching, evaluating, and selecting study materials, with males (Mean = 3.98, SD = 0.871) feeling more comfortable using these features than females (Mean = 3.79, SD = 0.866). In addition, regarding access and control of information obtained through ChatGPT, males (Mean = 4.01, SD = 0.877) found it easier than females (Mean = 3.82, SD = 0.856).
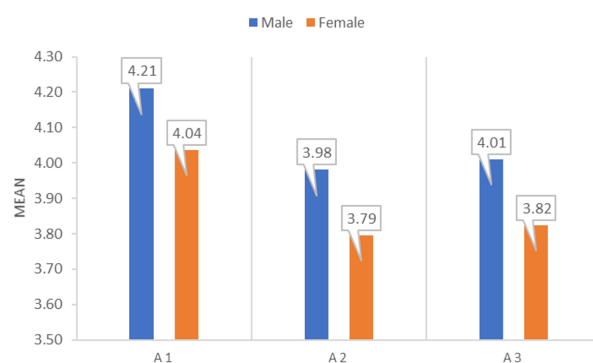

Figure 1 Ease of interaction and access to information: Interaction with ChatGPT is easy and understandable (A1); Easily search, evaluate, and select study materials through ChatGPT (A2); easy to access and control information obtained through ChatGPT (A3).

Males' ease in using technologies such as ChatGPT may be because they tend to have more experience and confidence in technology. Research shows that males are often more familiar with and confident using digital technologies than females (Hargittai & Shafer, 2006). This experience could stem from early exposure to technology from an early age and greater social support for males to learn technology (Goswami & Dutta, 2016). Studies have also found that

males tend to have higher levels of self-efficacy in using computers and information technology in general (Jackson et al., 2001). Perhaps this is because men have more opportunities to explore and practice using technology from a young age, both at home and in educational settings. In addition, social factors also play an important role in influencing men's perception and use of technology more than women's (Castillo et al., 2018).

4.2   User attitude and satisfaction

Figure 2 shows that males and females had positive attitudes and good satisfaction with using ChatGPT, with average scores ranging from 3.65 to 4.08. Males showed slightly more dominance in some aspects. For example, males (Mean = 3.73, SD = 0.978) thought using ChatGPT for learning was a good idea more than females (Mean = 3.65, SD = 0.971). In addition, males (Mean = 4.04, SD = 0.757) also showed more pleasure in using ChatGPT for learning than females (Mean = 3.81, SD = 0.878). Males (Mean = 4.08, SD = 0.759) also enjoyed using ChatGPT for learning more than females (Mean = 3.92, SD = 0.903).
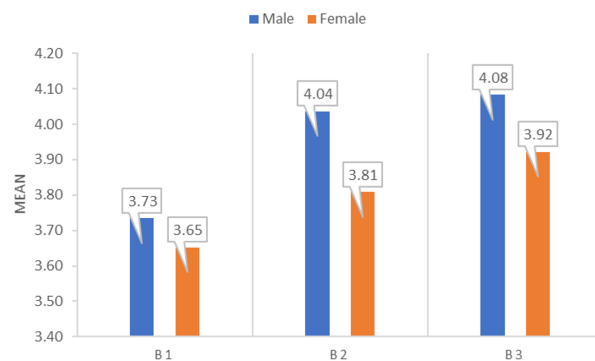

Figure 2   User attitude and satisfaction: Using ChatGPT for learning is considered a good idea (B1); happy to use ChatGPT for learning (B2); enjoy using ChatGPT for learning (B3).

This difference can be understood through males' and females' different learning approaches to technology. Males tend to be more interested in learning approaches that involve technology and active interaction than females. Research shows that males have more experience and skills in using technology because they spend more time with technology than females (Dindar, 2018). Males also tend to explore and try new things in the context of learning (Colley & Comber, 2003), whereas females may be more cautious (Fiorenzato et al., 2024) and take more time to adapt to new technological tools.

4.3   General Benefits

Figure 3 indicates that males were more satisfied with the benefits provided by ChatGPT, both in terms of important information obtained and the contribution of ChatGPT to their learning, with mean scores ranging from 3.81 to 4.17. Males (Mean = 4.06, SD = 0.736) were more satisfied with the information obtained than females (Mean = 3.81, SD = 0.869). In addition, males (Mean = 4.17, SD = 0.650) were more satisfied with the overall benefits of ChatGPT than females (Mean = 3.97, SD = 0.792). Males (Mean = 4.13, SD = 0.640) were also more pleased with the contribution of ChatGPT to learning than females (Mean = 3.91, SD = 0.810). It was also found that males (Mean = 3.94, SD = 0.837) perceived ChatGPT to contribute more effectively to acquiring new information in learning than females (Mean = 3.85, SD = 0.836).

This finding can be understood through differences in how males and females process and use information. Males favor visual representations and rapid information processing (Mayer & Massa, 2003), features often offered by technologies such as ChatGPT. They tend to prefer information sources that provide instant and easy access. On the other hand, females may prioritize the detail and depth of information obtained from other sources (Krasnova et al., 2017). They tend to be more critical in evaluating information and pay attention to risks, rewards, and costs. For example, in crises such as the 2018 California wildfires, research shows that men focus more on goals and past performance information, while women are more likely to consider risk and cost profiles (Lachlan et al., 2022). These differences reflect different preferences and approaches to utilizing technology and information, which may influence how they use tools such as ChatGPT in communication and decision-making. Additionally, while gender is a key factor, other variables – such as prior exposure to AI tools, academic discipline (*e.g.*, STEM *vs.* humanities), or socioeconomic background—could further explain
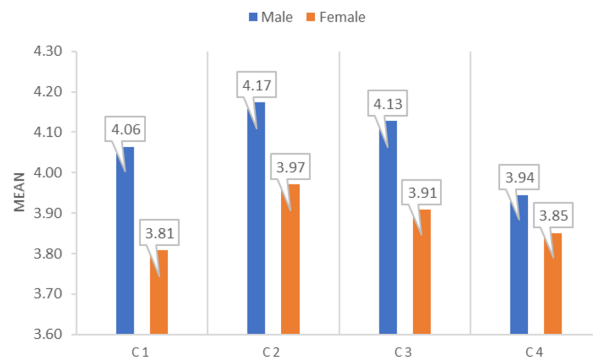
Figure 3   General benefits: Satisfied with much important information from ChatGPT (C1); satisfied with the benefits that ChatGPT provides (C2); happy with ChatGPT's contribution to learning (C3); ChatGPT contributes effectively to the acquisition of new information in learning (C4).

usage patterns. For instance, students in technical fields might rely more on ChatGPT for coding assistance, whereas humanities students may prioritize writing support. Future research should control for these variables to isolate gender-specific effects.

4.4   Academic Benefits

Figure 4 shows that males perceived greater academic benefits from using ChatGPT than females. For example, males (Mean = 3.88, SD = 0.754) felt ChatGPT improved their contribution in daily classes more than females (Mean = 3.67, SD = 0.866). Males (Mean = 3.94, SD = 0.761) also found that ChatGPT improved their understanding of practical subjects than females (Mean = 3.77, SD = 0.892). Interestingly, the results showed that females (Mean = 4.03, SD = 0.774) found ChatGPT slightly more helpful in theory assignments and homework than males (Mean = 4.01, SD = 0.726). The data also showed a moderate positive correlation between their academic benefits on theory assignments and homework ($r = 0.223$, $p < 0.05$). In addition, males (Mean = 3.89, SD = 0.809) felt that ChatGPT better enabled the integration of theoretical studies with practical experience than females (Mean = 3.70, SD = 0.870).
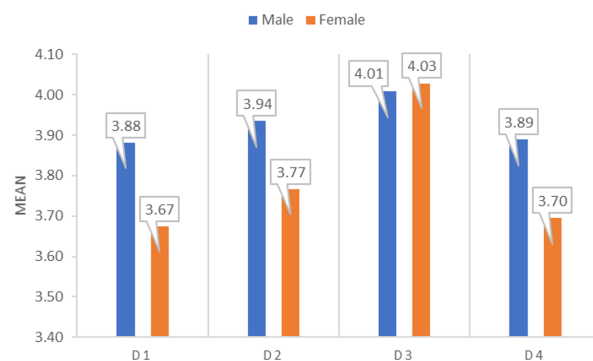

Figure 4   Academic benefits: ChatGPT improves daily class contributions (D1); ChatGPT improves understanding of practical subjects (D2); ChatGPT assists in theory assignments and homework (D3); ChatGPT enables the integration of theoretical studies with practical experience (D4).

This difference may be related to the different learning styles of males and females. Females seek more help and support in completing academic tasks, especially exploratory activities (Kinzie & Joseph, 2008). Perhaps this explains why they found ChatGPT helpful in doing theory assignments and homework. On the other hand, males tend to be more independent and may better appreciate the practical benefits of technologies such as ChatGPT in everyday learning. They tend to show positive attitudes toward using technology for self-study and experimentation (Cai et al., 2017). These differences in preferences reflect how males and females may utilize tools such as ChatGPT differently, depending on their learning styles and preferences in academic and learning approaches.

Overall, the findings from this study suggest that while both males and females have a positive view of ChatGPT, there are significant differences in how they use it and perceive its benefits. These differences are most likely influenced by technology experience, self-

confidence, and different learning styles. These findings align with previous research and provide additional insights into how technologies such as ChatGPT can effectively integrate into diverse educational contexts. Further research is needed to delve deeper into the factors that influence these differences and how technology-based education can be tailored to meet the different needs of male and female students. Future studies could employ MANOVA to test interactions between gender, discipline, and prior tech exposure, building on our descriptive findings.

5   Conclusion

This study aims to explore how male and female university students perceive and use ChatGPT in a learning context. The results showed that while males and females had a positive view of ChatGPT, their experiences showed significant differences.

(1) Ease of Interaction and Access to Information: Males found interacting with and understanding ChatGPT easier and were more comfortable searching, evaluating, and selecting learning materials. They also found it easier to access and control the information obtained than females. This may be due to differences in technology experience and confidence in using technology.

(2) Attitude and Satisfaction: Males showed a more positive attitude and higher satisfaction levels when using ChatGPT for learning. They perceived ChatGPT as a good idea and enjoyed using it more than females. This difference could be attributed to differences in learning approaches between males and females.

(3) General Benefits: Males were more satisfied with the information and benefits that ChatGPT provided. They perceived that ChatGPT made a greater contribution to their learning than females. It may be due to differences in how male and female information is processed and used.

(4) Academic Benefits: Males felt that ChatGPT enhanced their daily class contributions and understanding of practical subjects. Although females found ChatGPT slightly more helpful in theory assignments and homework, males felt that ChatGPT better enabled the integration of theoretical studies with practical experience. This difference could be related to different learning styles between males and females.

This study showed that university students well received ChatGPT. However, there were significant differences in the experiences and perceived benefits between males and females. These findings provide valuable insights into how technologies such as ChatGPT can be effectively integrated into education. Further research is needed to delve deeper into the factors that influence these differences and how technology-based education can be tailored to meet the different needs of male and female college students. Future studies could employ MANOVA to test interactions between gender, discipline, and prior tech exposure, building on our descriptive findings. By doing so, educators and educational technology developers can design more inclusive and effective solutions for all students.

Conflicts of interest

The authors declare that they have no conflict of interest.

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