

# Examining Students' Knowledge, Use, and Perceived Benefits of Artificial Intelligence Tools in Higher Education

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**Abstract:** This study examines the current use of artificial intelligence (AI) in higher education, focusing on how students interact with AI tools and their perceptions of their value. The research aims to: (1) identify the most commonly used AI tools among students and determine if usage varies by gender, (2) explore the purposes for which students use AI, the benefits they see, and their level of knowledge and skill in using these tools, and (3) assess students' perceptions of the ethical issues related to AI use. A survey was created and distributed to university students, resulting in 244 responses from AI users. Students express high confidence in their tech skills and mainly use AI tools for personalized learning. This research offers valuable insights into students' experiences with AI tools, highlighting both their advantages and ethical concerns, and ends with a discussion of the implications for higher education institutions.

**Keywords:** Student use of AI, perceived benefits of AI, AI use capabilities, AI and ethics

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## 1. Introduction

The rapid increase in accessibility of Artificial Intelligence (AI) technologies has introduced significant changes to both daily life and business operations. AI has rapidly gained widespread acceptance and is now being integrated across multiple sectors, particularly in business and education. According to Singh (2025), approximately 200 million people use ChatGPT daily, collectively generating over one billion queries a day.

In business, AI enhances operational efficiency, enables data-driven decision-making, and improves customer experiences through automated processes, predictive analytics, personalized marketing, supply chain optimization, and intelligent customer service via chatbots and virtual assistants. By identifying growth opportunities and mitigating risks, AI helps organizations maintain their competitive edge in rapidly evolving markets.

In the field of education, students are increasingly aware of AI; however, their understanding of its full capabilities and their own ability to utilize it meaningfully often varies. While many students recognize AI as a powerful tool for enhancing productivity and creativity, their understanding can range from viewing it as merely a means to automate routine tasks to appreciating its broader potential in problem-solving, critical thinking, and research assistance (e.g., Al-Zahrani, 2024; Cowling et al., 2023; Crompton & Burke, 2023; Daniel et al., 2025; Delcker et al., 2024; Ilieva et al., 2023; Kirwan, 2023). This gap between awareness and practical application underscores the importance of exploring the student perspective on AI use.

In practice, students rely on AI for a variety of academic and personal purposes, including creating personalized academic materials, receiving explanations for complex subjects, generating study resources, summarizing information, and even proofreading assignments. Beyond academics, students also use AI to learn new skills, organize schedules, explore creative projects, and find job opportunities (e.g., Habib et al., 2024; Pham et al., 2023; Wang et al., 2023; Zhang et al., 2023). It saves time by streamlining homework and research, enhances learning by providing personalized feedback and



clarification, and reduces stress by making challenging topics more comprehensible (e.g., Vorobyeva et al., 2025; Alenezi, 2023). This wide range of applications indicates that AI is becoming a versatile tool in students' daily lives, supporting both their educational journeys and everyday tasks. The student perspective considers AI not just as a convenience but as a valuable partner in achieving their educational goals. The study by Daniel et al. (2025) offers a comprehensive overview of the diverse benefits and impact of AI on students' academic skill development.

At the institutional level, higher education is also experiencing significant changes due to the integration of AI. Tools such as large language models (LLMs), intelligent tutoring systems, and automated content generators are now easily accessible to both students and instructors, impacting teaching, learning, and assessment practices. AI can perform a wide variety of routine academic tasks, including answering factual questions, formatting assignments, summarizing texts, providing tutoring support, assisting with writing and programming, and enabling real-time language translation (e.g., Boubker, 2024; Mondal et al., 2023; Ngo et al., 2024; Van den Berg & du Plessis, 2023). AI is fundamentally changing how organizations operate and how individuals learn, becoming a key tool that promotes greater efficiency. Universities are increasingly re-evaluating curriculum design and learning outcomes to keep pace with AI technologies (Cacho, 2024; Cardona et al., 2023). Institutions that proactively adopt and integrate AI will likely be better prepared to meet the evolving needs and expectations of today's learners. Furthermore, this shift requires rethinking accreditation standards, faculty development, and student support systems to keep up with the technological advances (Cardona et al., 2023).

The growing use of AI offers numerous benefits for both faculty and students across all levels of higher education. Students are increasingly adopting various AI tools, often with the expectation of enhancing their academic performance. However, it remains unclear which tools are most commonly used, for what specific purposes they are employed, and whether students believe they are fully realizing the benefits of these tools in their coursework. To address these gaps, this study focuses on the following issues: the purpose of AI tool usage, students' knowledge of AI use, and the benefits students perceive from their use. Specifically, the study aims to (a) identify students' primary uses of AI tools, as understanding these purposes can help promote more effective and widespread adoption; (b) determine the students' knowledge of AI tools, which is critical to utilizing them effectively and achieving desired benefits; (c) examine the perceived benefits of using AI tools. Additionally, this study investigates students' perceptions of ethical concerns related to the use of AI tools in higher education as an emerging technology. It also examines whether these concerns differ by gender, class level, and college affiliation. Overall, the study provides a comprehensive examination of the types of AI tools students use, their intended purposes, the benefits they perceive, and the ethical considerations they associate with AI use in academic settings.

This study provides valuable insights into students' understanding, perception, and usage of AI tools, highlighting both the benefits they perceive and the ethical concerns they raise. In addition to the potential benefits of AI documented in existing literature, a clear understanding of the purpose and effective use of these tools is critical for the growth of AI in higher education. In this respect, the findings of this study make several meaningful contributions to the existing literature on AI in higher education. These findings make several contributions to the existing literature on AI in higher education. First, while the study identified the most frequently used AI tools by students, it also revealed gender-based differences in AI tool preferences. This suggests that AI adoption strategies could benefit from recognizing and addressing gender-specific tendencies to encourage broader and more equitable use. Second, the study found that students have limited knowledge of how to use AI tools for routine coursework. They also perceive these tools as beneficial to their educational experience and personal development. While the AI benefits identified in this study are consistent with existing literature, the findings indicate that students' knowledge and application of AI tools across various applications needs to be improved to maximize their benefits for their academic experience. Third, despite recognizing the benefits of AI tools, students expressed significant ethical concerns regarding their use. This is consistent with prior research and highlights the importance of addressing these concerns through thoughtful

policies and curricular integration. In light of these contributions, these findings suggest that higher education institutions should develop targeted strategies for integrating AI tools that enhance learning and promote ethical awareness and digital literacy.

## 2. Background and Related Research

The Technology Acceptance Model (TAM) developed by Davis (1989) provides a theoretical foundation for this study, which identifies perceived usefulness and ease of use as the primary determinants of technology adoption. Extensions such as TAM3 (Venkatesh & Bala, 2008) broaden the model by incorporating social and cultural influences and facilitating conditions. In the context of education, Chatterjee & Bhattacharjee (2020) argue that AI adoption requires adapting TAM to pedagogical priorities and academic needs. Bogina et al. (2021) further highlight the role of systemic trust and collaborative cultures, while Luckin (2021) underscores the importance of ethically responsible strategies that safeguard academic integrity. These perspectives on TAM indicate that students' knowledge, skills, intended use, and the benefits of AI within institutional culture will be central to AI adoption in higher education. TAM also suggests that, in addition to perceived usefulness and ease of use, AI adoption requires knowledge of these tools and their intended purposes to realize the desired benefits. Therefore, the two concepts of knowledge and the purpose of AI use are included in the study.

Artificial intelligence (AI) is rapidly transforming education, offering new opportunities to enhance teaching, learning, and academic productivity. At the same time, it raises challenges around digital literacy, ethical use, and overreliance on automation, underscoring the need to evaluate both the scope of its applications and the depth of students' competencies.

The integration of AI tools, such as ChatGPT, into educational settings has attracted considerable attention in recent years (Chai et al., 2024). An expanding body of literature explores the diverse applications of AI in teaching, learning, and academic research, highlighting both its potential benefits and the challenges of its implementation. The following sections reorganize the existing literature to specifically address students' engagement with AI, focusing on their knowledge and use, perceived academic benefits, and associated ethical concerns.

### 2.1 Knowledge of AI Tools and the Purposes of Their Use

Specific tools have emerged as more prominent due to their widespread use (Lee et al., 2024). These tools, such as ChatGPT, Grammarly, Snapchat AI, Gemini, OtterAI, and Elicit, are transforming how students interact with course materials and reshaping expectations for independent learning, originality, and critical thinking (Al-Zahrani, 2024; Cardona et al., 2023; Daniel et al., 2024). These technologies provide immediate, individualized support, reducing barriers to understanding and encouraging iterative learning practices.

A study by Lee et al. (2024) found that among teaching staff, ChatGPT is the most widely used AI tool, followed by Bing AI, Midjourney, DALL-E, Grammarly, Research Rabbit, Otter, and Elicit. Their results showed that the most common use of AI was for teaching ( $n = 14$ ), followed by administrative tasks ( $n = 9$ ), with research-related tasks being the least frequently used ( $n = 8$ ). These findings indicate knowledge or awareness of these tools. However, their study did not examine the use of AI tools among college students. A growing body of research has demonstrated the use of AI for content generation (Mondal et al., 2023), the preparation of teaching materials (Van den Berg & du Plessis, 2023), and the creation of assessments (Ngo et al., 2024). Several studies have explored the application of AI tools in higher education. Sekli et al. (2024) provide an in-depth analysis of how AI tools are currently being used and their impact on educational outcomes, including a compilation of research studies that employ Generative AI (GenAI) tools. However, a gap remains in understanding student preferences for AI tools, which this study intends to address by examining the specific AI tools students use. In addition, understanding students' knowledge of AI tools and the purposes for which they are used can help

university administrators and AI company managers develop more effective strategies to promote their adoption and increase their use.

## 2.2 Perceived Benefits of AI

AI is transforming how students learn and how educators teach. Institutions that integrate AI proactively are better equipped to meet the changing needs of contemporary learners. Prior research has investigated the role of AI tools in shaping academic skill development within higher education.

One of the most significant applications of AI is personalized learning (Chai et al., 2024). By analyzing student data and learning patterns, AI can generate customized study materials and recommend individualized learning paths, allowing students to progress at their own pace (Vorobyeva et al., 2025; Alenezi, 2023). This tailored approach enhances student engagement and improves learning outcomes. In a systematic literature review, Daniel et al. (2025) analyzed how AI contributes to the development of cognitive, technical, and interpersonal academic skills. Their findings indicate that numerous studies have reported improvements in students' critical thinking and problem-solving abilities through the use of AI (Crompton & Burke, 2023; Delcker et al., 2024; Habib et al., 2024; Pham et al., 2023; Wang et al., 2023; Zhang et al., 2023). Other studies highlight improvements in technical academic skills such as data analysis capabilities (Boubker, 2024). Moreover, AI has been shown to support the development of interpersonal academic skills (Ilieva et al., 2023; Cowling et al., 2023; Daniel et al., 2025). Other studies have highlighted AI's role in enhancing various academic skills, including critical thinking (Kirwan, 2023), writing (Barrett & Pack, 2023), and communication (Michalon and Camacho-Zuniga, 2023). The above literature suggests that as perceived benefits of AI tools increase, more students are likely to adopt and use them in their academic work. This would lead to an increased adoption of AI tools, as suggested by TAM (Davis, 1989) and TAM3 (Venkatesh & Bala, 2008).

## 2.3 Ethical Concerns About Using AI

Despite its benefits for students, teachers, and researchers, AI also presents several risks (Sok et al., 2023). A primary concern is academic dishonesty, as students may use tools like ChatGPT to complete assignments that are intended to reflect their own work. Additional ethical issues arise when AI is used for grading or feedback, as these processes may lead to unfair or inaccurate outcomes if not carefully monitored. Lee et al. (2024) reported that nearly half of faculty were using AI in their teaching, and the most common change they made was adjusting assignments and exams to protect academic integrity. To address these integrity challenges, Sok et al. (2023) offer recommendations to mitigate the risks of using generative AI tools in educational settings. Collectively, these findings highlight the importance of examining students' perceptions of the ethical concerns surrounding the use of AI in higher education. This is because, as Bogina et al. (2021) and Luckin (2021) indicate, higher ethical concerns and honesty are important for the adoption of AI tools and technologies. Therefore, we expect a negative perception of the ethical use of AI tools.

While the ethical risks and concerns regarding academic dishonesty in AI use are increasingly recognized (Lee et al., 2024; Sok et al., 2023), prior studies have not investigated whether these concerns are influenced by demographic or academic factors, such as gender, class level (e.g., freshman, senior), or college/discipline affiliation. Exploring these dimensions would yield valuable insights for developing targeted, effective integrity policies. This study aims to address this gap by investigating how these factors affect students' perceptions of AI-related ethical issues.

In addition, this study explores students' perspectives on the types of AI tools they use, the purposes for which they employ them, the benefits they perceive, and the ethical concerns they identify. As educational models continue to evolve and AI tools become integrated into academic practice, it is essential to investigate current usage patterns and perceptions. The findings of this study will inform strategies to enhance student learning while safeguarding academic integrity. To achieve these aims, the study is guided by the following research objectives:

**RO1:** Identify the most commonly used AI tools by students and assess whether AI usage varies by gender.

**RO2:** Investigate a) students' level of knowledge of AI capabilities, b) the purposes for which they use AI, and c) the benefits they perceive from using AI tools.

**RO3:** Examine students' perceptions of ethical concerns related to AI use, both overall and by gender, and determine if these perceptions vary by gender, class level, and college affiliation.

### 3. Methodology

A survey instrument was designed to address the research objectives (ROs), with questions relevant to each objective. Some of the AI tools listed in the survey were drawn from Lee et al. (2024). A pretest was conducted with the target population, the students, to identify additional AI tools they use. Based on the work of Lee et al. (2024) and Sekli et al. (2024), and on suggestions from pretests, we identified 13 AI tools to include in the final survey.

To address RO2 on the use and benefits of AI and RO3 on ethical concerns, we utilized ChatGPT to generate relevant survey questions. By using targeted prompts, we focused on various educational applications and the perceived benefits of AI for students. We initially created 15 survey questions, which were then verified with relevant literature. The verification revealed that the AI-generated questions were consistent with enhancing various academic skills. These skills include critical thinking (Kirwan, 2023), writing (Barrett & Pack, 2023), and communication skills (Michalon & Camacho-Zuniga, 2023). Additionally, the question regarding ethical concerns was found to be consistent with prior studies' findings (Lee et al., 2024; Sok et al., 2023).

The questions we prepared were pretested in two stages. In the first stage, we gathered feedback from academicians on the clarity, relevance, and appropriateness of the questions. The survey was revised based on their input, and additional questions were added. In the second stage, the improved survey questions were pretested again, yielding 84 responses from students across various class levels and colleges. This pretest improved the clarity, understandability, and appropriateness of the questions, as suggested by Churchill & Iacobucci (2005). Results from several analyses indicated that the survey questions were suitable for examining the use and benefits of AI in students' education. After pretesting, the final survey includes 24 questions. These questions used a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The survey included a screening question to allow respondents who had used AI in their coursework to participate. Finally, the study included demographic questions on gender, class level, and the college students enrolled.

### 4. Sampling Plan and Data Collection

Because the study aimed to examine college students' use of AI tools and their perceived benefits, the target population included college students. The survey was conducted at a comprehensive, private university in the Midwestern United States. The survey link was sent to all students, totaling approximately 2,600 students. To encourage participation and boost the response rate, four \$50 gift cards were offered as incentives. After the initial survey, two follow-up reminder emails were sent. A total of 244 usable responses were received, yielding a response rate of approximately 9.4%, which falls within the standard range of 5%-15% for online surveys (Upadhyay, 2025). It is not possible to determine whether non-respondents chose not to participate or were not AI tool users, as non-users were not eligible to participate in the survey. Consequently, the response rate may have been influenced by the proportion of students who currently use AI tools. Future research could address this limitation by explicitly surveying students who do not use AI tools to understand their reasons for non-adoption better. Table 1 presents the demographic profile of the respondents, where the majority (58.2%) identified as female, 35.2% were senior students, and most were enrolled in the College of Arts and Sciences.

**Table 1.** Respondent Profiles

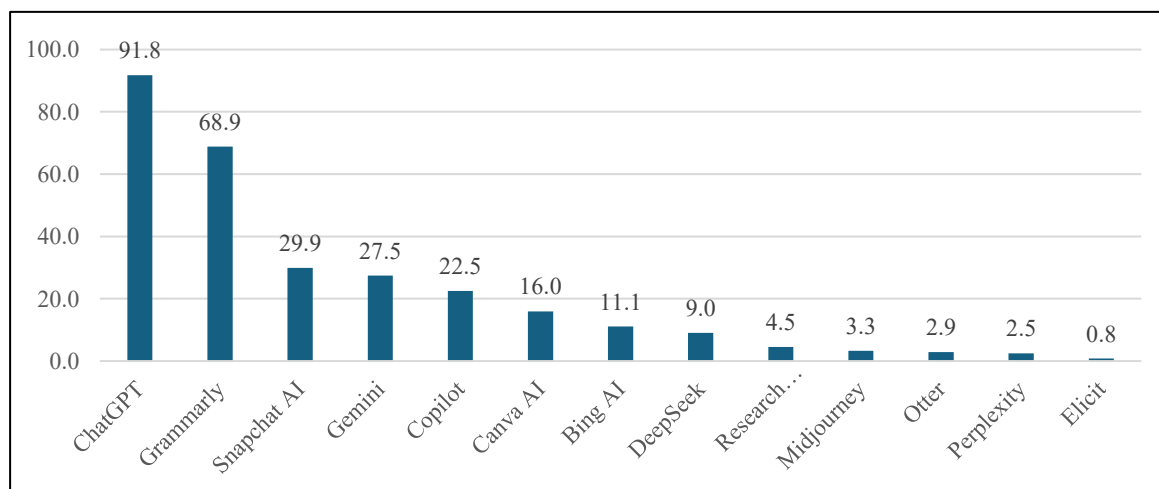
| <b>Gender</b>                        | <b>Number of Respondents (n)</b> | <b>Percent</b> |
|--------------------------------------|----------------------------------|----------------|
| Female                               | 142                              | <b>58.2</b>    |
| Male                                 | 90                               | 36.9           |
| Total                                | 232                              | 95.1           |
| <i>Class</i>                         |                                  |                |
| Freshman                             | 40                               | 16.4           |
| Sophomore                            | 50                               | 20.5           |
| Junior                               | 50                               | 20.5           |
| Senior                               | 86                               | <b>35.2</b>    |
| Graduate                             | 18                               | 7.4            |
| Total                                | 244                              | 100.0          |
| <i>College</i>                       |                                  |                |
| College of Arts and Sciences         | 83                               | <b>34.0</b>    |
| College of Business                  | 55                               | 22.5           |
| College of Engineering               | 40                               | 16.4           |
| College of Nursing and Life Sciences | 47                               | 19.3           |
| Graduate School                      | 19                               | 7.8            |
| Total                                | 244                              | 100.0          |

## 5. Results

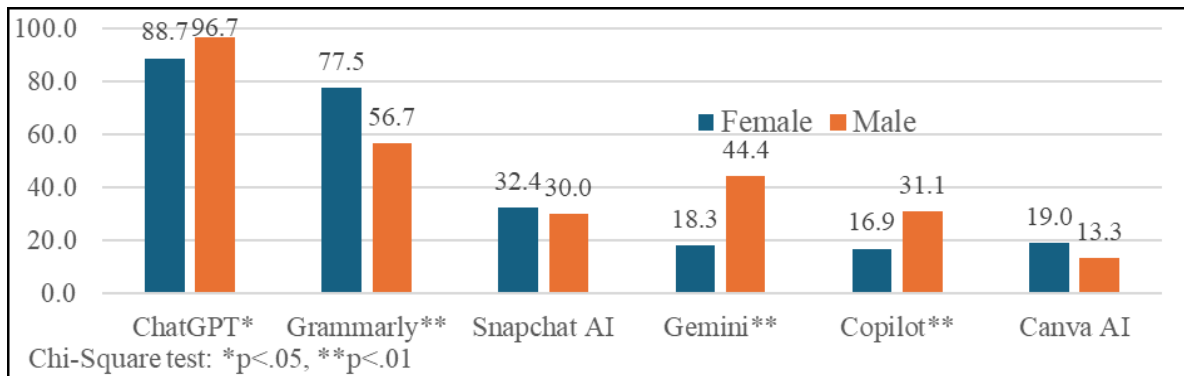
A series of analyses is conducted for each RO, and the results are presented below.

**RO1:** Identify the most commonly used AI tools by students and assess whether AI usage varies by gender.

The results in Figure 1 show that ChatGPT was the most widely used AI tool, with 91.8% of respondents reporting its use. This is followed by Grammarly (68.9%), Snapchat AI (29.9%), Gemini (27.5%), Copilot (22.5%), and Canva AI (16.0%). Other AI tools reported, in descending order, are Bing AI, DeepSeek, Research Rabbit, Midjourney, Otter, Perplexity, and Elicit.

**Figure 1.** Distribution of AI Tools Used by Students

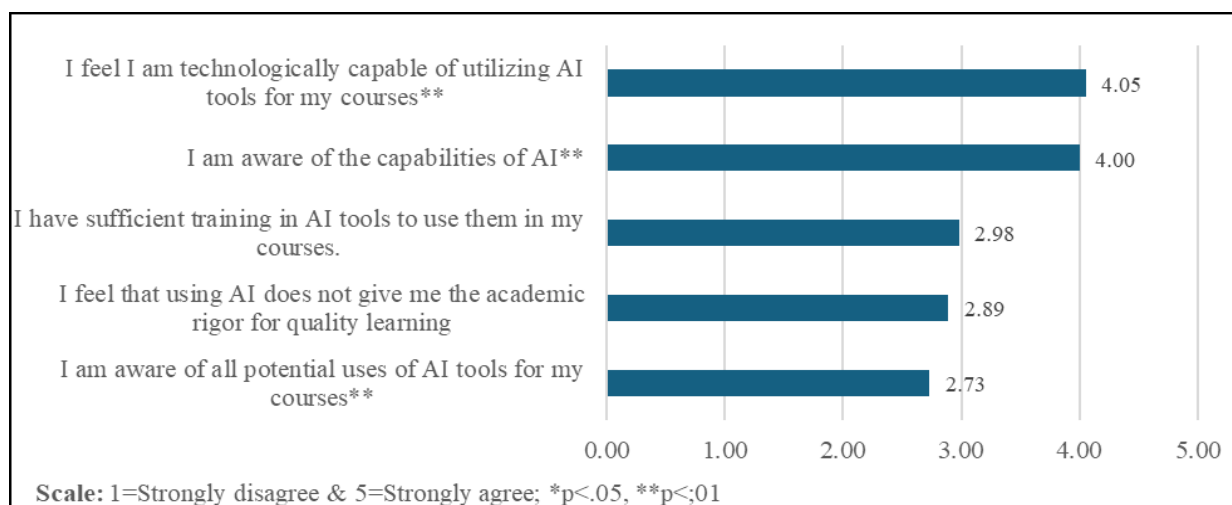
Additionally, we examined the use of AI tools by respondent gender. Figure 2 shows the distributions of the six most commonly used AI tools by gender. Chi-square tests found statistically significant differences between male and female students in their use of ChatGPT ( $p < .05$ ), Grammarly, Gemini, and Copilot ( $p < .01$ ). These results indicate that male students are significantly more likely to use ChatGPT, Gemini, and Copilot. In contrast, female students are significantly more likely to use Grammarly. On the other hand, both males and females have similar usage preferences for Snapchat AI and Canva AI ( $p > .05$ ).



**Figure 2.** Top Six AI Tools Used by Gender

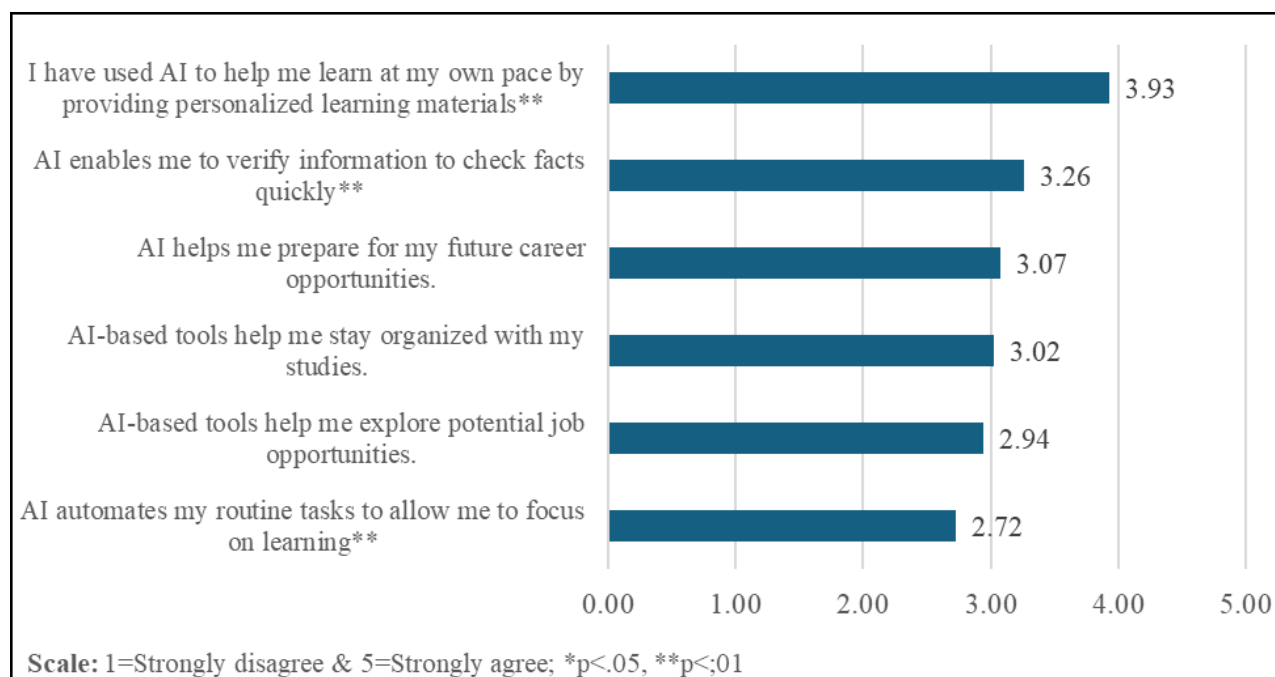
**RO2:** Investigate a) students' level of knowledge of AI capabilities, b) the purposes for which they use AI, and c) the benefits they perceive from using AI tools.

The AI-related questions, as indicated with RO2, were organized into three categories: (a) students' knowledge of AI capabilities, (b) the purposes of using AI, and (c) the perceived benefits of AI tools. The results are presented below. To assess whether responses significantly differed from the neutral midpoint of the scale (test value = 3), one-sample t-tests were conducted for each item. This analysis indicated whether students expressed significant agreement or disagreement with the AI-related statements. Figure 3A shows the results for the five items measuring students' knowledge of AI capabilities. Two items were significant at  $p < .01$ , indicating that students feel technologically capable of using AI tools and are aware of AI's current capabilities. For two other items, responses did not significantly differ from neutrality, suggesting uncertainty. Notably, students significantly disagreed with the statement concerning their awareness of AI's potential uses in their courses.



**Figure 3A.** Students' Knowledge of Using AI Tools

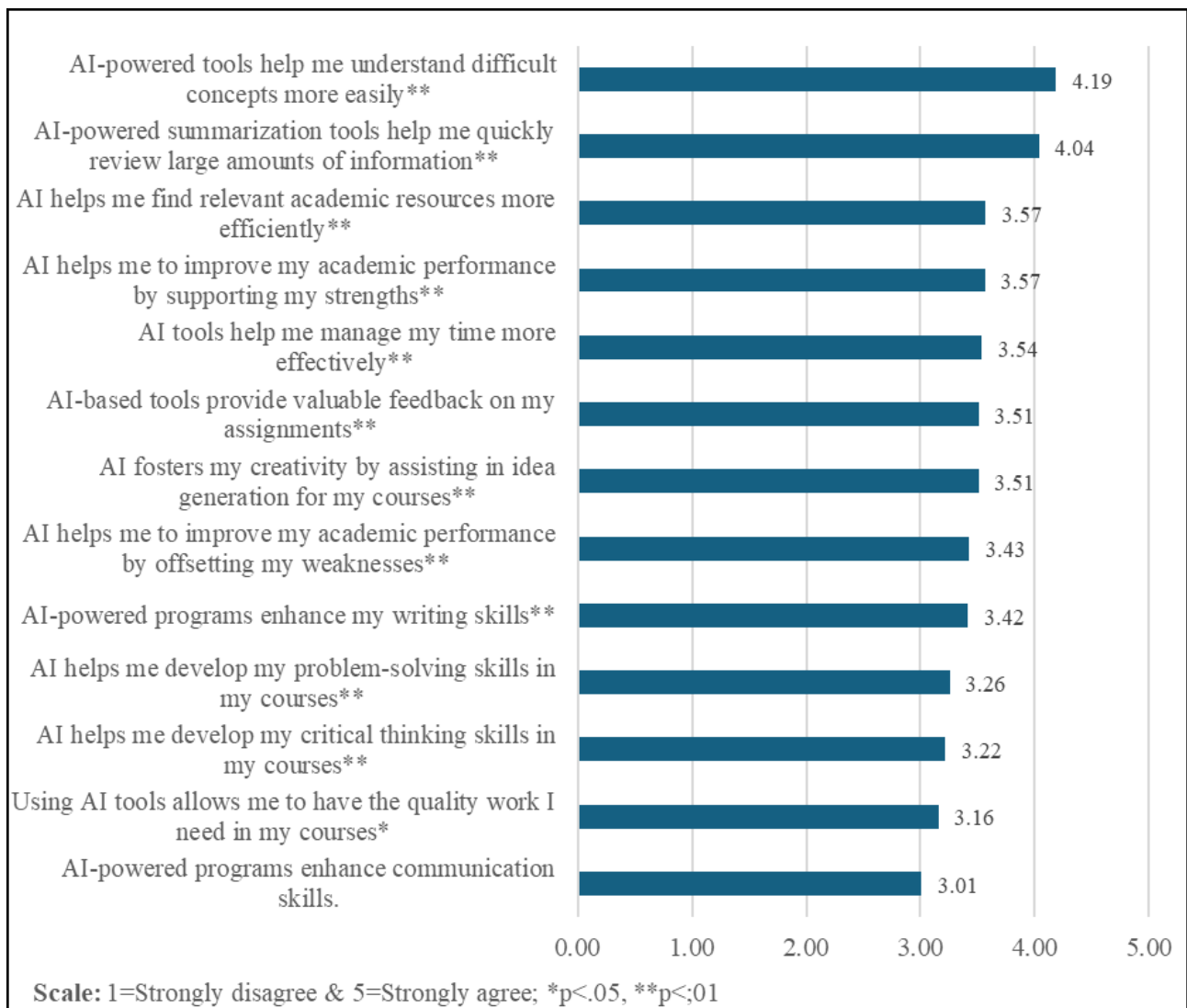
Figure 3B illustrates how students use AI tools. The results indicate that participants strongly agreed with the statements: “AI helps me learn at my own pace by providing personalized learning material,” and “AI enables me to verify information to check facts quickly.” Both were statistically significant ( $p < .01$ ). Three other items in this category did not significantly differ from the neutral midpoint ( $p > .05$ ). At the same time, respondents strongly disagreed with the statement: “AI automates my routine tasks to allow me to focus on learning” ( $p < .01$ ).



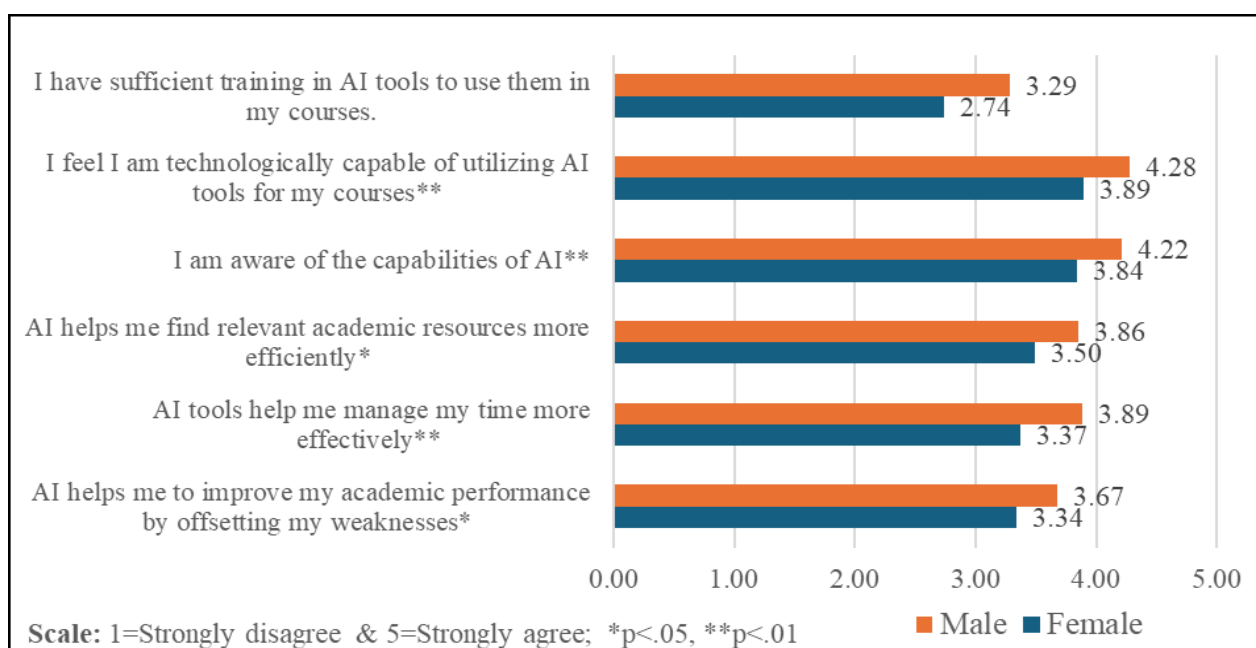
**Figure 3B.** Purpose of Using AI Tool by College Students

Figure 3C illustrates student perceptions of the benefits of using AI in their courses (Part C of RO2). Respondents identified several statistically significant advantages (at  $p < .05$  or  $p < .01$ ). The most notable perceived benefits include “understanding difficult concepts more easily,” “quickly reviewing large amounts of information,” “finding relevant academic sources more efficiently,” “improving academic performance by supporting my strengths or offsetting weaknesses,” “fostering creativity by assisting in idea generation for my course,” and “enhancing writing skills, developing problem-solving, and critical thinking skills.” In contrast, students reported that AI use does not provide any significant benefit for “enhancing communication skills” ( $p > .05$ ).

The study also examined the effects of gender on knowledge of AI, the purpose of using AI, and the benefits of AI tools. As shown in Figure 4, the results reveal statistically significant differences ( $p < .05$ ,  $p < .01$ ) between male and female respondents on six questions. In all cases, males reported greater perceived use and benefits of AI tools than females did. These significant differences suggest that male students are using AI tools more frequently and perceive greater benefits from their use. The findings are also consistent with the benefits identified by Daniel et al. (2025) in their comprehensive review of the extant literature. The findings of this study demonstrate that students derive diverse benefits from using AI tools, which contribute to the development of both personal and academic skills.



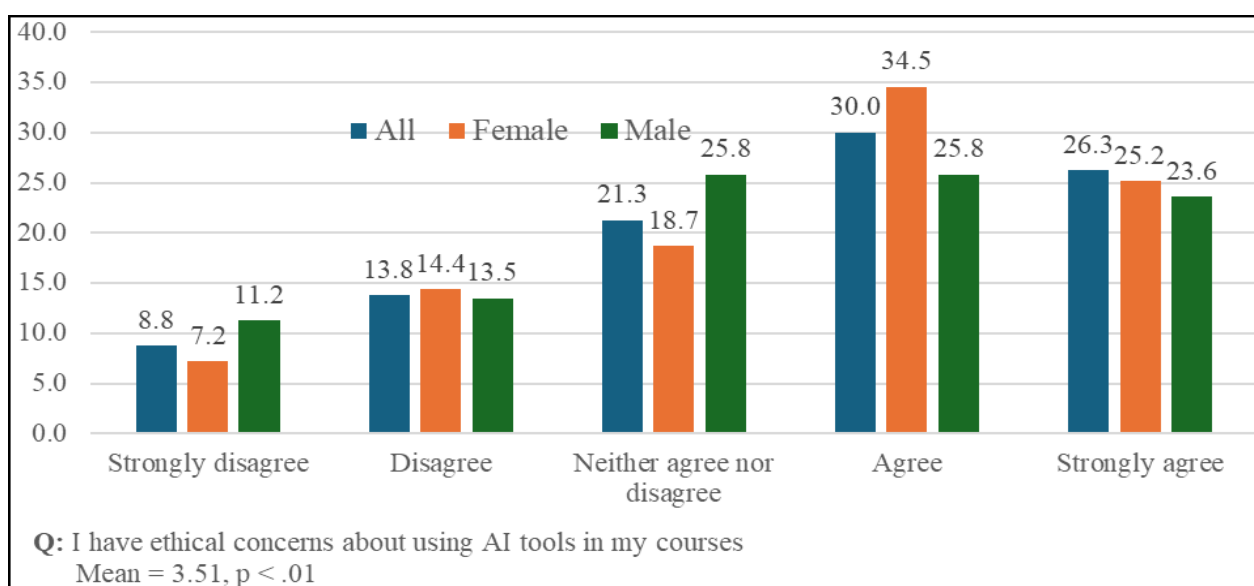
**Figure 3C.** Perceived AI Benefits by College Students



**Figure 4.** Significant Comparisons of AI Factors by Gender

**RO3:** Examine students' perceptions of ethical concerns related to AI use, both overall and by gender, and determine if these perceptions vary by gender, class level, and college affiliation

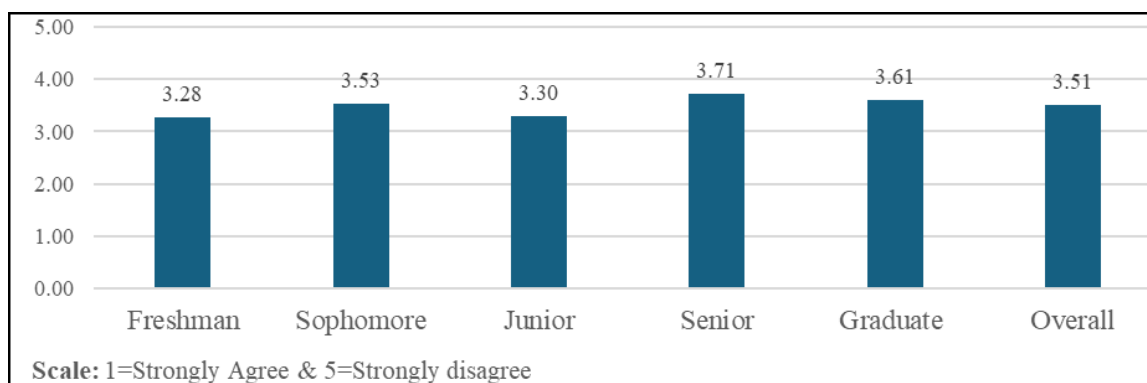
To address RO3 regarding ethical concerns about AI use among students, the results are presented in Figure 5. The mean value for the ethics-related item, 3.51, is significantly higher than the neutral midpoint value of 3.0 ( $p < .01$ ), indicating that respondents are moderately concerned about using AI in their courses. This concern is further supported by the distribution of responses given to the options "agree and strongly agree". 56.3% of respondents selected "agree" or "strongly agree" with the ethics concern statement. Additionally, the gender breakdown indicates that more than half of the females (59.7%) and nearly half of the males (49.4%) are concerned about the ethical use of AI tools. A comparison of concern about the ethical use of AI found no significant difference between males and females, indicating that both genders share similar concerns.



**Figure 5.** Ethical Concerns for Using AI among All Students and by Gender

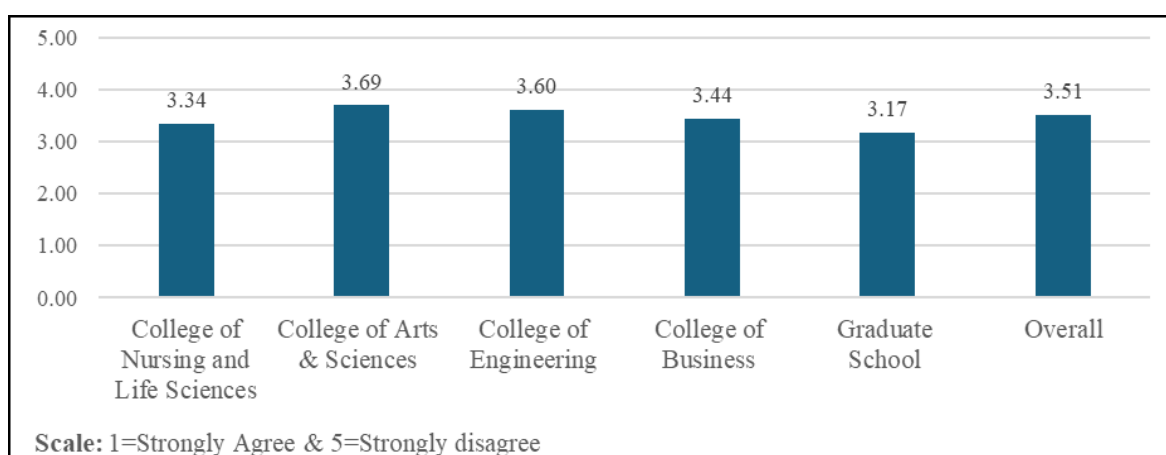
As shown in Figure 5, students, overall and across gender, express ethical concerns about using AI tools in their courses. This is supported by a one-sample t-test, which revealed that the mean ethical concern score of 3.51 was significantly higher than the neutral test value of 3.0 ( $p < .001$ ). To further address RO3, the study investigated whether gender, class level, and college affiliation influenced students' ethical concerns. A two-sample t-test indicated no significant difference between male ( $M = 3.37$ ) and female ( $M = 3.56$ ) students ( $p > .05$ ). This indicates that both genders share similar levels of concern regarding the ethical implications of using AI in their coursework.

To compare ethical concerns across class levels and colleges, a one-way ANOVA was conducted. The dependent variable was agreement with the statement, "I have ethical concerns about using AI tools in my courses." Class level and college affiliation served as the categorical factors. The ANOVA results for class level showed no significant differences ( $F(4,235) = 1.25, p = .286$ ). As shown in Figure 6, the mean scores ranged from 3.28 to 3.71, all of which were above the neutral benchmark of 3.0, indicating that students across all class levels consistently expressed ethical concerns about the use of AI in their courses.



**Figure 6.** Ethical Concerns for Using AI by Students' Class Level

Additionally, the one-way ANOVA results for comparisons by college affiliation were not significant ( $F(4, 235) = 1.06, p = .378$ ). This indicates that students across different colleges share similar levels of ethical concern regarding the use of AI tools in their coursework. As shown in Figure 7 (the mean values ranging from 3.17 to 3.69), the overall concern remains above the neutral point of 3, indicating concern about using AI tools; however, the level of concern is consistent across all colleges. In summary, the statistical analysis, based on a one-way ANOVA, found no significant differences in students' ethical concerns about the use of AI tools in their courses across class levels or college affiliations.



**Figure 7.** Students' Ethical Concerns for Using AI by College

## 6. Conclusion and Discussion

This study aimed to explore students' perspectives on the types of AI tools they use, their intended purposes, and the perceived benefits and ethical concerns associated with their use. The findings offer valuable insights into each of these areas and could help develop strategies to support students' academic skills across key areas.

The results show that the most commonly used AI tools were ChatGPT, followed by Grammarly, Snapchat AI, Gemini, Copilot, and Canva AI. In contrast, tools such as Elicit, Perplexity, Otter, Midjourney, and Research Rabbit were used far less frequently. These findings align with prior research showing that students gravitate toward widely accessible, user-friendly generative AI tools that directly support writing, content generation, and immediate feedback (Al-Zahrani, 2024; Daniel et al., 2025). Gender-based comparisons further revealed meaningful differences in AI tool preferences: male students were more likely to use ChatGPT, Gemini, and Copilot, whereas female students preferred Grammarly. Similar gender-based variations in technology use have been documented in prior research, with studies

showing that male students tend to emphasize task-oriented and performance-driven applications, whereas female students more frequently use technologies for process support and refinement tasks (Venkatesh & Morris, 2000; Ong & Lai, 2006; Barrett & Pack, 2023). These patterns suggest differences in academic needs or task orientations rather than resistance to AI technologies. Recognizing these differences may help universities promote more inclusive and effective AI adoption strategies by tailoring training and support to diverse student groups.

The findings on students' knowledge, use, and perceived benefits of AI tools align closely with the Technology Acceptance Model (TAM), which emphasizes perceived usefulness as a primary driver of technology adoption (Davis, 1989). Students reported high confidence in their ability to use AI tools and demonstrated awareness of AI's current capabilities; however, many were uncertain about the broader pedagogical applications of AI in their coursework. This gap between technical confidence and pedagogical awareness aligns with prior research showing that students often use AI tools for immediate, task-oriented purposes rather than for deeper learning or skill development (Alenezi, 2023; Daniel et al., 2025). From a TAM3 perspective (Venkatesh & Bala, 2008), this finding suggests that perceived usefulness may be constrained by limited instructional guidance and social reinforcement for meaningfully integrating AI into academic work. Consequently, universities may need to move beyond permissive AI policies and adopt more intentional curricular strategies that explicitly demonstrate the practical and ethical use of AI. Consistent with prior studies, students reported that AI tools are most frequently used to support personalized, self-paced learning and to verify information quickly (Vorobyeva et al., 2025; Alenezi, 2023). In contrast, students were less likely to use AI to automate routine academic tasks, indicating that AI is viewed primarily as a learning aid rather than a substitute for effort. This finding reinforces the idea that students perceive AI as a complementary resource that enhances understanding rather than as a tool for academic shortcutting. This distinction is essential for both instructional design and policy development.

Regarding perceived benefits, students identified multiple ways in which AI tools enhance their academic and personal development, including improving understanding of complex concepts, supporting critical thinking and problem-solving, and enhancing writing and communication skills. These findings align with prior research documenting positive effects of AI on academic skill development (Barrett & Pack, 2023; Crompton & Burke, 2023; Kirwan, 2023; Michalon & Camacho-Zuniga, 2023). The alignment between this study's findings and the comprehensive review by Daniel et al. (2025) further reinforces the robustness of these perceived benefits. Together, these results suggest that AI tools can meaningfully contribute to both academic performance and personal skill development when used appropriately. Moreover, while some gender-based differences were observed in perceived use and benefits, overall perceptions of AI's value were generally similar across groups, indicating broad acceptance of AI's academic potential.

Ethical concerns emerged as a prominent theme in the findings. Consistent with prior literature (Lee et al., 2024; Sok et al., 2023), students expressed moderate but significant concern about the ethical use of AI tools in their courses. Importantly, these concerns did not differ significantly by gender, class level, or college affiliation, suggesting that ethical apprehensions about AI use are widespread and not limited to specific student subgroups. This uniformity suggests that ethical concerns may reflect broader institutional and cultural uncertainties about appropriate AI use rather than individual characteristics. From a TAM3 perspective, such concerns may influence trust and, consequently, long-term adoption of AI technologies (Chatterjee & Bhattacharjee, 2020; Bogina et al., 2021). These findings underscore the importance of institution-wide ethical guidelines and transparent communication about acceptable AI practices in higher education.

Overall, this study contributes to the growing literature on AI in higher education in several ways. First, it provides student-centered empirical evidence that students perceive a range of benefits from using AI tools in their courses. Second, it identifies a gap between students' confidence in using AI tools and their understanding of how to apply them effectively for academic learning. Third, it finds that ethical concerns about AI use are common and consistent across demographic groups, suggesting the need for

coordinated institutional approaches. From a practical perspective, these findings suggest that higher education institutions may benefit from developing more structured strategies for integrating AI tools into curricula, with attention to both pedagogical value and ethical considerations. This issue is increasingly relevant given the rapid adoption of AI in professional contexts, as Walmart CEO Doug McMillon noted, observing that “AI is going to change literally every job” (Nassauer & Cutter, 2025, September 26). From a theoretical standpoint, the results extend TAM and TAM3 by underscoring the roles of knowledge, purpose of use, perceived benefits, and ethical considerations in shaping AI adoption in higher education.

### Authors contributions

Musa Pinar, Haydar Çukurtepe, Ayşegül Yayımlı and Faruk Güder contributed equally to this work.

### Statements and Declarations

#### Ethical Considerations

Not applicable.

#### Consent to Participate

Informed consent was obtained from all participants before data collection.

#### Consent for Publication

All authors consent to the publication of this manuscript.

#### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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#### Data availability

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