# Artificial intelligence in higher education: Benefits and concerns

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## ABSTRACT

Artificial intelligence (AI) is transforming higher education through applications such as adaptive learning platforms, virtual assistants, and predictive analytics. This study examines AI's impact on student motivation, academic performance, and ethical considerations, using survey data from 76 students across five universities in Odessa, Ukraine. Participants from STEM, the humanities, and the social sciences offered diverse perspectives on AI use. The findings indicate that more frequent AI use is positively associated with motivation ($r = 0.60$, $p < 0.01$), involvement ($r = 0.67$, $p < 0.01$), and self-reported academic performance ($r = 0.54$, $p < 0.05$). Students also perceived AI as supportive for retention ($M = 4.05$, $SD = 0.79$; 78%) and understanding ($M = 3.90$, $SD = 0.85$; 74%), and reported higher focus ($M = 4.10$, $SD = 0.77$; 80%) and efficiency ($M = 4.30$, $SD = 0.72$; 85%). Ethical concerns were prominent, with strong agreement on plagiarism awareness, responsible use, and data privacy (Krippendorff's $\alpha = 0.86$–$0.91$). STEM students showed the most positive attitudes toward AI (78% positive) compared with the humanities (55%) and social sciences (67%). While AI fosters inclusivity by supporting non-native English speakers and students with learning disabilities, gaps in AI literacy and infrastructure limit equitable access. The study underscores the importance of governance frameworks to address ethical challenges and calls for targeted investments in AI training for students and faculty. This research highlights AI's potential to enhance learning while emphasizing the need for responsible integration. By offering evidence-based recommendations, the study informs future strategies to ensure AI serves as a tool for empowerment rather than inequity.

**Keywords:** Artificial intelligence, higher education, student motivation, academic performance, ethical considerations, personalized learning.

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## INTRODUCTION

Artificial intelligence (AI) is rapidly transforming higher education, becoming a crucial tool for personalizing learning, enhancing administrative efficiencies, and expanding student support mechanisms. Its applications range from adaptive learning platforms that tailor educational content to individual students to virtual assistants that provide around-the-clock support. This widespread adoption of AI has raised expectations for improved academic outcomes and increased operational efficiency in educational institutions. However, it has also introduced new complexities and challenges, particularly around ethical considerations, data privacy, and academic integrity.

As institutions adopt AI-powered tools to support student engagement and retention, they must also navigate the ethical landscape of responsible AI use. The ability of generative AI models to produce high-quality text, for example, raises questions about originality and academic honesty. At the same time, predictive analytics tools require access to sensitive data, sparking concerns about data security and transparency. Moreover, the growing role of AI in academic settings brings changes to traditional teaching roles, as automation reshapes how educators interact with students and conduct assessments.

AI's potential extends beyond academic support to fostering inclusivity, as it can provide additional resources for students who face language barriers or learning challenges. Programs aimed at embedding AI literacy across disciplines underscore the need for students in all fields to develop a critical understanding of AI technologies and their applications. This foundational knowledge not only prepares students for AI-driven careers but also cultivates responsible usage patterns that align with ethical and academic standards.

In light of these factors, this study examines students' experiences and perceptions of AI use in higher education in relation to the outcomes reported in the present dataset. Specifically, it aims to (1) explore the association between the frequency of AI use and students' self-reported motivation, involvement, and academic performance; (2) assess perceived contributions of AI tools to retention and understanding of course material; (3) examine how ethical concerns (e.g., plagiarism awareness, responsible use, and data privacy) relate to students' usage patterns; (4) compare attitudes toward AI across academic disciplines (STEM, humanities, and social sciences); and (5) evaluate the perceived role of instructor guidance in supporting responsible AI use. By aligning these objectives with the empirical results, the study contributes to a more focused understanding of how AI is currently experienced by students and what conditions may support its effective and ethical integration in higher education.

### Research questions

● How does the frequency of AI usage affect student motivation, engagement, and academic performance in higher education?
● To what extent does AI usage enhance students' retention and understanding of course material?
● What is the relationship between students' ethical concerns about AI and their usage patterns in academic settings?
● How do students perceive the role of AI in improving their focus and efficiency during study sessions?
● How does the use of AI influence students' perceptions of the usefulness and relevance of their coursework?
● What are the main factors that influence students' willingness to use AI as a learning tool?
● How does instructor guidance on AI usage affect students' responsible use and ethical understanding of AI in academics?
● What types of AI tools are most frequently used by students, and for what purposes (e.g., retention, information search, project assistance)?
● Are students who frequently use AI more likely to report higher self-assessed academic performance than those who use AI infrequently?
● How do students' attitudes towards AI vary based on their academic discipline or field of study?

## LITERATURE REVIEW

Artificial intelligence (AI) has become a transformative force in higher education, significantly influencing teaching, learning, and administrative processes. As universities increasingly adopt AI-driven tools, scholars have examined both the opportunities and challenges associated with their integration. While AI holds immense potential for improving educational outcomes, promoting inclusivity, and streamlining operations, its implementation raises critical ethical considerations and demands careful oversight to maximize its benefits and minimize unintended consequences. By synthesizing findings from recent studies, this review explores the multifaceted role of AI in higher education, focusing on its contributions to personalized learning, student support, faculty engagement, ethical dilemmas, and long-term educational strategies.

The potential of AI to revolutionize learning experiences is widely recognized. Adaptive learning platforms such as ALEKS exemplify how AI can create personalized educational pathways by adjusting content delivery and pacing according to individual student progress. Hannan and Liu (2023) highlight the measurable benefits of such systems, citing Arizona State University's significant increase in College Algebra pass rates following the adoption of ALEKS. Similarly, AI-enhanced Learning Management Systems (LMS) such as Blackboard and Canvas have enabled institutions to provide dynamic, tailored learning experiences. Chan (2023) underscored the importance of adaptive learning in higher education, emphasizing that AI tools offering real-time feedback and support can target areas where students need additional assistance, thereby improving learning outcomes and fostering academic success. Saaida (2023) complemented this view by pointing to intelligent tutoring systems and virtual learning assistants, which further individualize the educational process, enhancing student engagement and motivation.

AI also plays a pivotal role in enhancing student support services. Virtual assistants such as Jill Watson at Georgia Tech demonstrate how AI can provide round-the-clock assistance to students, addressing queries related to course selection, career planning, and wellness. Hannan and Liu (2023) noted that such tools not only improve access to support but also relieve administrative burdens on faculty and staff. Predictive analytics represents another domain where AI has shown promise. By analyzing student behavior and performance data, institutions can identify at-risk students and implement early interventions. For example, Georgia State University's use of AI to track academic progress has significantly improved retention rates. Firaina and Suliswor (2023) extended the discussion by illustrating how ChatGPT supports both students and educators, facilitating content generation, translation, and lesson planning. This dual benefit highlights AI's multifaceted

role in addressing diverse educational needs.

Despite these advantages, integrating AI into higher education is not without challenges. Ethical considerations are the recurring theme in the research concerning AI, with scholars emphasizing the need for robust governance frameworks to address issues such as data privacy, algorithmic bias, and accountability. Chan (2023) argues that transparency in AI operations is essential to building trust among students and faculty. Similarly, Saaida (2023) warned that the misuse of student data and the perpetuation of biases through poorly designed algorithms could undermine the equitable use of AI tools. Michel-Villarreal et al. (2023) focused on generative AI technologies like ChatGPT, highlighting their potential to disrupt academic integrity by enabling students to bypass critical thinking and independent learning. Current plagiarism detection tools often struggle to identify AI-generated content, underscoring the importance of clear policies to guide ethical use. Sullivan, Kelly, and McLaughlan (2023) echoed this concern, suggesting that universities rethink assessment methods to encourage creativity and originality – areas where AI cannot easily replicate human abilities.

The impact of AI on faculty roles is another area of interest. Ghamrawi et al. (2023) explored how AI supports teacher leadership by streamlining administrative tasks and enabling personalized instruction. However, they caution that over-reliance on AI could marginalize educators, reducing their influence in curriculum development and classroom management. Nguyen (2023) categorizes AI applications into guidance, student-focused, and teacher-support systems, highlighting their potential to enhance decision-making and automate routine tasks such as grading. While these advancements allow educators to focus on meaningful engagement with students, Nguyen emphasizes the need for comprehensive training to ensure that faculty can navigate the complexities of AI integration effectively. Firaina and Suliswaro (2023) added that educators must critically evaluate AI-generated content to ensure its accuracy and relevance, balancing the efficiency of automation with the quality of instruction.

Generative AI technologies, particularly ChatGPT, have sparked considerable debate regarding their educational potential and ethical implications. Michel-Villarreal et al. (2023) highlight the accessibility benefits of ChatGPT, particularly for non-native English speakers who rely on its language support capabilities. By providing grammar corrections and clear explanations, ChatGPT reduces barriers to academic success and promotes inclusivity. However, its ability to generate high-quality text also raises concerns about plagiarism and over-reliance on technology. Zhai (2023) suggested that educators design assignments requiring critical analysis and problem-solving to mitigate these risks. Sullivan et al. (2023) note that some universities have reverted to traditional assessment methods, such as handwritten exams, to limit

the misuse of generative AI. While these measures address immediate concerns, they also highlight the need for long-term strategies to foster responsible AI usage.

AI's role in promoting inclusivity extends beyond addressing language barriers. Southworth et al. (2023) describe the University of Florida's "AI Across the Curriculum" initiative, which integrates AI literacy into programs across all disciplines. This approach prepares students for an AI-driven workforce by equipping them with the skills needed to navigate technological advancements. By embedding AI education within diverse academic contexts, the initiative broadens access to technological knowledge and fosters interdisciplinary collaboration. Hannan and Liu (2023) emphasize that such efforts are essential for addressing the digital divide, ensuring that students from underrepresented backgrounds can benefit from AI-enhanced learning environments. However, the successful implementation of these initiatives requires substantial investment in infrastructure and training. Chan (2023) notes that universities must provide both faculty and students with the resources and support needed to adapt to AI technologies effectively.

The potential of AI to reshape educational objectives and assessment practices is another key theme in the literature. Zhai (2023) explores how ChatGPT automates complex assessment tasks, enabling teachers to provide personalized feedback aligned with standards such as the Next Generation Science Standards (NGSS). This automation reduces the time and effort associated with traditional grading methods, allowing educators to focus on instructional activities that require human judgment. However, Zhai cautions that over-reliance on AI in assessments could undermine the development of critical thinking and creativity. He advocates balanced approaches in which AI complements traditional pedagogical methods, preserving educators' roles in fostering higher-order cognitive skills.

The literature also underscores the importance of interdisciplinary approaches to AI education. Southworth et al. (2023) highlight the need for AI literacy programs that prepare students to apply AI tools across diverse professional contexts. Nguyen (2023) categorizes AI applications into three domains – guidance systems, student-focused tools, and teacher-support technologies – illustrating their versatility in addressing educational challenges. These applications not only enhance learning and teaching but also promote collaboration and innovation across disciplines. Zhai (2023) adds that AI's potential to personalize education and automate resource-intensive tasks positions it as a catalyst for educational reform, particularly in fields such as science, technology, engineering, and mathematics (STEM).

Despite these opportunities, the integration of AI into higher education faces significant barriers. Firaina and Suliswaro (2023) note that while tools like ChatGPT improve efficiency, their effectiveness depends on critical engagement and verification. Educators must validate AI-

generated content to ensure its alignment with academic standards and learning objectives. Ghamrawi et al. (2023) argue that AI's impact on teacher leadership requires thoughtful integration to balance automation with meaningful human interaction. Without deliberate planning, there is a risk that AI could exacerbate existing inequalities and reduce the human element in education.

Ethical considerations remain central to discussions about AI's role in higher education. Chan (2023) and Saaida (2023) emphasize the importance of governance frameworks that address transparency, accountability, and fairness. Institutions must establish clear policies to guide the ethical use of AI, ensuring that these tools are deployed in ways that support inclusivity and equity. Michel-Villarreal et al. (2023) and Sullivan et al. (2023) advocate for guidelines that not only deter misuse but also educate students and faculty on the responsible application of AI technologies. These frameworks are critical for fostering a culture of trust and accountability in AI-enhanced learning environments.

As AI continues to evolve, its integration into higher education presents both opportunities and challenges. The studies demonstrate that while AI can enhance learning, streamline operations, and promote inclusivity, its implementation requires careful planning and oversight. By addressing ethical concerns, investing in infrastructure and training, and fostering interdisciplinary collaboration, universities can harness the transformative potential of AI to create more dynamic and equitable educational systems. However, achieving this balance will depend on sustained efforts to align technological advancements with human-centered educational practices, ensuring that AI serves as a tool for empowerment rather than a source of inequity.

## METHODOLOGY AND POPULATION

Utilizing a mixed-methods approach, both quantitative survey data and qualitative insights were collected to capture a nuanced view of student experiences and perceptions.

The research was conducted at five universities in Odessa, Ukraine, spanning a range of academic disciplines, including STEM, humanities, and social sciences. The participant pool included students at various educational levels, from undergraduate to graduate programs, ensuring diverse representation of experiences and insights related to AI in higher education. In total, 76 students took part in the survey. Consent to participate and consent to publish were obtained from all participants.
To gather data, students completed a structured questionnaire organized into sections that examined the frequency of AI use, perceived benefits, ethical considerations, and impact on learning outcomes, such as retention and comprehension. Responses were collected anonymously to encourage honest and reflective feedback. The questionnaire design included both closed-ended questions, which enabled statistical analysis, and open-ended questions, which allowed students to elaborate on their experiences with AI tools.

For data analysis, quantitative responses were examined using correlation analyses to explore associations between AI usage and academic outcomes. Qualitative responses were coded to identify key themes that provide contextual insight into the quantitative findings, particularly in relation to students' motivations, challenges, and ethical concerns regarding AI.

## Research procedure

The research design employed in the study is correlational, focusing on between-subjects analysis to examine the relationship between AI use in educational settings and students' academic and ethical perceptions. Convenience sampling was used to recruit participants.

The research procedure consisted of three main steps:

### *Step 1: Survey development and ethical approval*

An online questionnaire was created in Google Forms and reviewed by the primary researcher to ensure clarity and relevance to the study objectives. Ethical approval for the study was obtained from the education ethics committee, ensuring that all data collection adhered to ethical standards. The questionnaire link was distributed through university channels, allowing students to voluntarily participate. It was emphasized that the data collected would be used solely for research purposes, ensuring participant confidentiality.

### *Step 2: Instrumentation and data collection*

The questionnaire consisted of three main sections: demographic information, students' attitudes and experiences with AI in academic contexts, and their ethical perspectives on AI usage. Demographic questions included age, year of study, and field of specialization. The questionnaire was developed based on constructs commonly discussed in the literature on AI use in higher education, including academic engagement, perceived learning support, and ethical considerations related to AI-assisted study practices. Items were formulated to reflect students' self-reported experiences and perceptions rather than objective performance measures.

Responses to the main sections were recorded using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Higher scores indicated more positive perceptions of AI use, stronger agreement with ethical awareness statements, or higher perceived academic benefits, depending on the section.

To examine the psychometric properties of the instrument, internal consistency was assessed using Cronbach's Alpha for each thematic section, demonstrating satisfactory reliability across scales. In addition, Krippendorff's Alpha was applied to evaluate agreement across key items related to engagement, understanding, and ethical considerations, indicating a high level of consistency in participants' responses.

Content validity was supported through alignment of survey items with previously published research on AI-supported learning, academic integrity, and digital ethics. While the instrument was not intended as a standardized diagnostic tool, these procedures ensured that the questionnaire provided a reliable and conceptually grounded measure of students' perceptions of AI use in academic contexts.

### Step 3: Data analysis

Data analysis was conducted using Krippendorff's Alpha to assess interrater reliability for key items related to engagement, understanding, and ethical perspectives on AI. Cronbach's Alpha was used to assess internal consistency within each survey section, ensuring reliable measurement across related items. To explore relationships among variables, Pearson correlation tests were conducted, focusing on the associations among AI usage frequency, engagement levels, and academic retention. Pearson correlation analyses were conducted to examine associations between AI usage frequency, engagement levels, and perceived academic outcomes. All statistical analyses were performed using SPSS (version 25).

### Ethical approval

The research was ethically approved by the Ethics Committee of Ariel University (Approval Number: AU-SOC-ND-20241229, Date: 29.12.2024). Prior to participation, all participants were duly informed of their rights and responsibilities and provided explicit written consent. The study was conducted in accordance with the guidelines governing research involving human participants, as outlined by the Ethics Committee of Ariel University.

## RESULTS

### Demographic overview

The study engaged 76 students from five universities located in Odessa, Ukraine, spanning a variety of disciplines such as STEM, humanities, and social sciences. The participants represented a mix of academic stages, from undergraduate to graduate levels, providing a broad perspective on how AI is utilized across different fields and educational levels.

**Table 1.** Demographic overview.

|  | STEM | Humanities | Social Sciences | Total |
|---|---|---|---|---|
| Total participants (n) | 27 (35.5%) | 26 (34.2%) | 23 (30.3%) | 76 (100%) |
| Age 17-23 | 24 (32%) | 21 (27.6%) | 20 (26.3%) | 65 (85.5%) |
| Age 24+ (second degree/part-time studies) | 3 (3.9%) | 5 (6.6%) | 3 (3.9%) | 11 (14.5%) |
| Mean age (SD) | 21.3 (2.1) | 21.7 (2.4) | 22.1 (2.3) | 21.7 (2.3) |
| Undergraduate students | 22 (28.9%) | 18 (23.7%) | 17 (22.4%) | 57 (75%) |
| Graduate students | 5 (6.6%) | 8 (10.5%) | 6 (7.9%) | 19 (25%) |

The samples in Table 1 include students from STEM, humanities, and social sciences, with a relatively balanced distribution across disciplines. Most participants were between 17 and 23 years of age, reflecting a predominantly undergraduate population, while a smaller proportion represented older students enrolled in second-degree or part-time programs. The majority of respondents were undergraduate students, with graduate students constituting one quarter of the sample. The mean age was comparable across disciplines, indicating a broadly homogeneous age profile within the study population.

### Impact of AI usage frequency on motivation, engagement, and academic performance

To explore how frequently students use AI and its relationship with motivation, involvement, and academic performance, we analyzed usage patterns alongside these academic outcomes.

The analysis of the results in Table 2 suggests that frequent AI usage is associated with meaningful improvements in several key academic areas. Regular AI users demonstrate higher levels of motivation and active involvement in their studies, which translates into

enhanced academic performance. Specifically, the positive correlation with academic performance indicates that increased AI use could support better grades and a more successful overall academic experience. These findings underscore the potential of AI tools as effective aids in fostering both engagement and achievement among students in higher education.

**Table 2.** Relationship between AI usage frequency and academic outcomes.

| Variable | Correlation (r) | p-value |
|---|---|---|
| Motivation | r = 0.60 | p < 0.01 |
| Involvement | r = 0.67 | p < 0.01 |
| Academic performance | r = 0.54 | p < 0.05 |

## AI usage and enhancement of retention and understanding of course material

The study examined the role of AI in aiding students' retention and comprehension of course content. Students provided feedback on how specific AI tools impacted their ability to retain information and understand complex materials.

The analysis in Table 3 indicates that a substantial portion of students find AI beneficial for retaining and understanding course material, with a majority reporting noticeable improvements in these areas. This suggests that AI tools play a supportive role in enhancing cognitive engagement with academic content.

**Table 3.** Impact of AI on retention and understanding of course material.

| | Mean rating (1-5) | SD | Reporting improvement (%) |
|---|---|---|---|
| Retention | 4.05 | 0.79 | 78 |
| Understanding | 3.90 | 0.85 | 74 |

## Relationship between ethical concerns and AI usage patterns

The research investigated how students' ethical concerns regarding AI influence their usage patterns. Key areas of ethical focus included plagiarism awareness, responsible usage, and data privacy concerns, reflecting the dimensions that students consider significant when using AI tools.

**Table 4.** Ethical concerns and AI usage patterns.

| Ethical concern | Krippendorff's alpha (α) |
|---|---|
| Plagiarism awareness | α = 0.91 |
| Responsible usage | α = 0.88 |
| Data privacy concerns | α = 0.86 |

The results from Table 4 indicate that students with heightened awareness around plagiarism and responsible usage are more selective in their AI engagement. The high Krippendorff's Alpha scores reflect strong agreement among participants on these ethical concerns. Specifically, students concerned about plagiarism tend to use AI tools selectively, likely to avoid potential ethical violations. Those with a strong understanding of responsible AI use demonstrate a cautious approach, suggesting a commitment to ethical practices in their academic work. Additionally, privacy concerns contribute to limited AI use, as students who prioritize data security prefer to minimize their interaction with AI tools that may involve sharing personal information.

## Perceptions of AI in improving focus and efficiency during study sessions

This section explores students' perceptions of AI's role in enhancing focus and efficiency in their academic activities. Many students reported that AI aids in organizing their study sessions and maintaining concentration, especially when managing complex or large amounts of information.

Table 5 shows that students find AI tools valuable for enhancing focus and efficiency. A high percentage of students reported that AI assists them in staying organized

and maintaining productivity during study sessions. This indicates that AI tools are instrumental in managing academic tasks efficiently and positively contribute to students' learning experiences.

**Table 5.** AI's impact on study focus and efficiency.

| Factor | Mean rating (1-5) | SD | % Reporting improvement |
|---|---|---|---|
| Focus | 4.10 | 0.77 | 80 |
| Efficiency | 4.30 | 0.72 | 85 |

## Influence of AI on students' perceptions of coursework relevance

The research also examined students' views on whether AI contributes to a sense of coursework relevance, specifically in terms of real-world applicability and career preparation.

The findings in Table 6 suggest that students generally perceive AI as a valuable tool that enhances the practical relevance of their coursework. This perception aligns with students' desire to see a clear connection between their academic efforts and their future career paths, emphasizing AI's potential role in making learning more applicable and professionally oriented.

**Table 6.** AI's role in making coursework relevant.

| Perception of coursework relevance | Mean rating (1-5) | SD | Percentage perceiving increased relevance (%) |
|---|---|---|---|
| Applicability to real life | 4.15 | 0.84 | 82 |
| Career preparation | 3.95 | 0.88 | 76 |

## Factors influencing students' willingness to use AI

To provide insight into students' engagement with AI, we examined various motivating and deterring factors that shape their usage preferences.

**Table 7.** Key drivers and barriers to AI engagement among students.

| Factor | Student responses (%) |
|---|---|
| Time efficiency | 28 |
| Accessibility | 24 |
| Personalization | 17 |
| Ethical concerns | 13 |
| Technical issues | 11 |

Table 7 illustrates that time efficiency, accessibility, and personalized learning stand out as primary factors encouraging students to engage with AI. Conversely, concerns around ethics and technical reliability emerge as notable barriers, reflecting students' caution regarding responsible usage and tool dependability.

## Instructor's role in promoting ethical AI usage

The study also examined the role instructors play in encouraging ethical AI usage among students. Results showed that students who received clear guidance from instructors on ethical AI usage were more confident and responsible in their approach.

The findings in Table 8 indicate that instructor-led support plays a critical role in encouraging students to use AI responsibly. The high ratings for ethical clarity and confidence suggest that students greatly benefit from structured guidance, which helps them navigate ethical considerations effectively and fosters a more conscientious approach to AI in academic settings.

**Table 8.** Instructor's role in promoting ethical AI usage.

| Variable | Mean rating (1-5) | SD | Positive impact reported (%) |
|---|---|---|---|
| Ethical clarity | 4.20 | 0.81 | 84 |
| Confidence in usage | 4.05 | 0.83 | 80 |

## Types of AI tools most frequently used by students

This section examines which AI tools students use most frequently, and for what academic purposes, such as enhancing retention, supporting information retrieval, or aiding project development. Understanding these usage patterns is crucial for evaluating how AI supports students' academic endeavors.

**Table 9.** Frequency of AI tool usage by academic purpose.

| AI tool | Purpose(s) | Percentage of students using |
|---|---|---|
| Grammarly | Writing assistance, grammar checks | 45 |
| Wolfram Alpha | Information search, problem solving | 37 |
| Kahoot | Engagement, quizzes, learning review | 29 |
| Microsoft Copilot | Project assistance, writing help | 22 |
| ChatGPT | Text generation, information synthesis | 78 |

According to Table 9, the results from this question reveal a range of tools that students identified as useful for their academic work, many of which are widely recognized but are not AI in the strict sense. While Grammarly, Wolfram Alpha, and Microsoft 365 Copilot are digital tools that incorporate elements of AI, Kahoot is not an AI tool at all.

This suggests that students may not fully distinguish between tools that are powered by artificial intelligence and other digital platforms that facilitate learning. The data shows that while there is significant engagement with platforms that offer AI-like functionality, there is some confusion or lack of clarity about what constitutes an AI tool in the context of academic work.

Future research could explore this understanding gap and assess whether students are fully aware of the specific capabilities that AI tools offer in contrast to more conventional digital tools.

## AI usage and academic performance

In this section, the study analyzed the correlation between the frequency of AI usage and students' self-reported academic performance. The goal is to determine whether frequent AI use is associated with improved academic outcomes, providing insights into how technology may influence students' success.

**Table 10.** Correlation between AI usage frequency and self-reported academic performance.

| Frequency of AI usage | Mean self-assessed academic performance (1-5) | p-value |
|---|---|---|
| Frequent usage (≥ 3 times/week) | 4.25 | < 0.05 |
| Infrequent usage (< 3 times/week) | 3.80 | |

The data in Table 10 suggest that students who use AI more frequently (at least three times a week) report a higher self-assessed academic performance (mean score of 4.25) compared to those who use AI less frequently (mean score of 3.80). This supports the hypothesis that frequent engagement with AI tools is associated with better academic outcomes. Students who integrate AI into their learning more regularly may benefit from enhanced resources and support, leading to greater academic success.

## Attitudes towards AI across academic disciplines

This section explores how students' attitudes towards AI vary across academic disciplines and fields of study. To assess this, we analyzed students' responses regarding the use of AI tools in academic settings, considering whether their field of study influenced their perception and acceptance of AI technologies.

The results in Table 11 suggest that students in STEM fields generally exhibit a more positive attitude toward AI, with 78% expressing favorable views. This is in contrast to students in the Humanities, where only 55% of respondents reported a positive attitude, and 14% held negative views. The Social Sciences also showed moderate support for AI, with 67% reporting positive attitudes and 23% neutral.

The data suggests that the nature of the academic discipline influences attitudes towards AI. STEM students, who are more likely to engage with AI technologies in their coursework and research, tend to have more favorable

opinions. Conversely, students in Humanities who do not directly incorporate AI technologies in their studies are more neutral or skeptical about its role in education.

These findings indicate the need for discipline-specific strategies to integrate AI into the curriculum and to address the varying levels of acceptance across academic fields.

Furthermore, as AI becomes more integral to all fields of study, it will be essential to bridge the gap in understanding and perception between disciplines, ensuring that students across all areas of study are equipped to utilize AI effectively and ethically.

**Table 11.** Students' attitudes towards AI by academic discipline.

| Discipline | Positive attitude (%) | Neutral attitude (%) | Negative attitude (%) | % of Students reporting AI use |
|---|---|---|---|---|
| STEM | 78 | 15 | 7 | 88 |
| Humanities | 55 | 31 | 14 | 76 |
| Social Sciences | 67 | 23 | 10 | 82 |

## DISCUSSION

The findings of this study indicate that students' AI use in higher education is associated with both perceived academic benefits and ethical concerns. Specifically, the results show positive relationships between the frequency of AI use and motivation, involvement, and self-reported academic performance (Table 2), alongside reported improvements in retention and understanding (Table 3) and strong agreement on ethical concerns related to plagiarism awareness, responsible use, and data privacy (Table 4). These patterns frame the discussion of how students experience AI-enabled learning and what conditions may support its responsible integration.

A key finding was the positive association between frequent AI use and students' motivation ($r = 0.60$, $p < 0.01$), involvement ($r = 0.67$, $p < 0.01$), and self-reported academic performance ($r = 0.54$, $p < 0.05$) (Table 2). In students' accounts, regular use of AI tools was linked to greater perceived focus and productivity during study activities, which is consistent with the high ratings reported for focus and efficiency (Table 5). These results align with prior work on AI-supported personalization and academic support (Hannan and Liu, 2023), while also suggesting that students' perceived usefulness of AI for their immediate learning needs may be a key condition for sustained adoption.

Students also perceived AI tools as supportive for retention ($M = 4.05$, $SD = 0.79$) and understanding of course material ($M = 3.90$, $SD = 0.85$) (Table 3). This pattern suggests that students experience AI primarily as a scaffold for working with complex academic content, such as clarifying key concepts, organizing information, and supporting revision processes. These perceptions are broadly consistent with prior discussions of AI-supported feedback and tutoring in higher education (Zhai, 2023). At the same time, the present findings do not allow causal conclusions regarding learning gains; rather, they indicate that students who engage with AI perceive it as helpful

within their existing study practices.

Differences in attitudes toward AI were also evident across academic disciplines (Table 11). Students in STEM fields expressed the most positive views toward AI and reported the highest levels of use, whereas students in the humanities were more neutral or skeptical about its relevance to their studies. Social sciences students occupied an intermediate position, combining moderate levels of AI use with comparatively strong ethical awareness. These disciplinary patterns suggest that acceptance of AI is shaped not only by technological exposure but also by disciplinary cultures and epistemological traditions. This interpretation is consistent with Nguyen's (2023) typology of AI applications across educational domains and underscores the need for discipline-sensitive strategies when integrating AI into higher education curricula.

Ethical considerations constituted a central dimension of students' engagement with AI in the present study. Strong agreement was observed across items related to plagiarism awareness, responsible use, and data privacy (Table 4), indicating that ethical reflection accompanies AI use rather than being external to it. Students who expressed greater concern about these issues tended to describe a more selective and cautious approach to AI-supported academic work. This finding aligns with arguments emphasizing transparency and accountability as core elements of AI governance in higher education (Chan, 2023). Importantly, the results suggest that ethical awareness does not function solely as a constraint on AI adoption but may also support more deliberate and responsible patterns of use.

The study revealed that frequent AI users perceived their coursework as more relevant and aligned with real-world applications. This connection between AI usage and perceived relevance was particularly strong among students who viewed AI as a bridge between academic learning and career preparation. This finding highlights how AI literacy fosters not only technical competence but

also a deeper appreciation for the practical value of education, emphasizing its role in preparing students for real-world applications and career readiness.

Instructor guidance emerged as an important contextual factor shaping students' ethical engagement with AI (Table 8). Students who perceived higher levels of ethical clarity provided by instructors also expressed greater confidence in using AI responsibly in their academic work. This association suggests that pedagogical guidance plays a mediating role between institutional norms and students' everyday AI practices. Consistent with Ghamrawi et al. (2023), the findings highlight the expanding role of educators not only as content experts but also as facilitators of responsible technology use in AI-enhanced learning environments.

Analysis of students' responses regarding frequently used tools (Table 9) indicates that ChatGPT was the most commonly used platform for academic purposes, particularly for text generation and information synthesis. Other tools, such as Grammarly, Wolfram Alpha, and Microsoft Copilot, were primarily associated with writing support, problem-solving, and project assistance. At the same time, the inclusion of platforms that are not strictly AI-based (e.g., Kahoot) suggests a blurred boundary in students' understanding of what constitutes artificial intelligence in academic contexts. This finding points to a conceptual rather than purely technical issue and underscores the need for clearer AI literacy frameworks that distinguish between AI-driven systems and general digital learning tools, echoing calls for critical engagement with AI technologies in higher education (Firaina and Sulisworo, 2023).

Taken together, the findings suggest that students' engagement with AI is shaped by a dynamic balance between perceived academic benefits and ethical considerations. While frequent AI users tended to report higher motivation, efficiency, and perceived academic performance, ethical concerns related to plagiarism and data privacy were associated with more cautious and selective use. This balance reflects a form of negotiated engagement rather than unconditional acceptance of AI technologies. Similar concerns have been raised in the literature regarding the risks of over-reliance on generative AI and its potential impact on critical thinking and independent learning (Michel-Villarreal et al., 2023). The present findings therefore support the need for institutional frameworks that do not merely restrict AI use but actively guide students toward responsible and reflective engagement.

Despite the reported benefits of AI use, the findings also point to structural limitations that may constrain its equitable implementation. Students' reliance on AI tools presupposes access to adequate digital infrastructure and a baseline level of AI literacy, conditions that may not be equally available across institutional or socioeconomic contexts. As a result, AI has the potential both to support learning and to reinforce existing inequalities if access and

guidance are uneven. This interpretation aligns with concerns raised about algorithmic bias and unequal access in higher education (Saaida, 2023) and underscores the importance of targeted institutional support to mitigate these risks.

Overall, the discussion of the findings highlights the importance of maintaining a balanced, human-centered approach to AI integration in higher education. While frequent AI use was associated with higher self-assessed academic performance and perceived study efficiency, these benefits emerged alongside strong ethical awareness and a clear reliance on instructor guidance. This combination suggests that AI is most effective when embedded within pedagogical practices that preserve human judgment, critical thinking, and academic responsibility. In line with Zhai (2023), the present findings support an integrative view of AI as a complementary resource rather than a substitute for traditional educational processes.

## Conclusion

The findings of this study reaffirm the transformative role of artificial intelligence (AI) in higher education, demonstrating consistent associations between AI use and students' self-reported motivation, engagement, retention, and perceived academic performance. The results indicate that students primarily experience AI as a supportive learning resource that enhances study efficiency and focus, while ethical concerns related to plagiarism, data privacy, and responsible use remain salient across academic disciplines.

This research adds to the growing body of knowledge on AI in education by emphasizing its practical benefits, including personalized learning experiences and enhanced access to academic support. The findings indicate that students perceive AI as a resource that supports real-time feedback, task organization, and study focus, in line with broader trends in technology-enhanced education. At the same time, the results point to persistent concerns related to ethical use, data privacy, and potential over-reliance on AI tools, particularly generative technologies such as ChatGPT. Taken together, these findings underscore the importance of institutional contexts that support transparent, accountable, and ethically informed AI use in higher education.

The disciplinary differences observed in students' attitudes toward AI are particularly noteworthy. While students in STEM fields showed strong enthusiasm for AI, those in the humanities were more neutral or skeptical. This suggests that efforts to integrate AI into education must be tailored to the needs and expectations of different academic disciplines. The importance of ethical AI literacy also emerged as a recurring theme, with students and instructors alike emphasizing the value of guidance on responsible usage. These findings underline the

importance of fostering interdisciplinary collaboration and developing comprehensive strategies to address gaps in understanding and acceptance of AI across fields.

From a broader perspective, this study underscores the potential of AI to act as both a facilitator and an equalizer in education. Its ability to provide tailored support for diverse learners, including those with language barriers or specific learning needs, aligns with the goal of creating more inclusive educational environments. Programs like AI literacy initiatives not only prepare students for AI-driven workplaces but also cultivate critical thinking and responsible usage practices, ensuring that the benefits of AI extend beyond academia.

Looking ahead, this research highlights several areas for future inquiry. First, understanding how different types of AI tools are adopted and adapted across disciplines can inform the development of more targeted educational technologies. Second, exploring the long-term effects of AI on students' critical thinking, creativity, and professional readiness can shed light on its broader implications for learning and workforce preparation. Finally, investigating the intersection of AI and equity, particularly in addressing the technology access gap, will be crucial for ensuring that AI tools are accessible and beneficial to all learners.

The study reinforces the importance of a balanced and thoughtful approach to integrating AI in higher education. While the benefits of AI are undeniable, its implementation must be guided by ethical principles and supported by ongoing dialogue among educators, policymakers, and technology developers. By addressing the challenges and building on the strengths identified in this research, institutions can harness the full potential of AI to create more dynamic, inclusive, and effective educational systems. Ultimately, this balance will ensure that AI serves as a tool for empowerment, fostering innovation and equity in education for generations to come.

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