

# Exploring Social Sciences and Humanities Student Perspectives on AI in Higher Education: A Comprehensive Study of Usage, Ethics, and Future Intentions

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## Abstract

This study investigates social science students' perceptions, attitudes, and behavioral intentions toward artificial intelligence (AI) in higher education at Sultan Qaboos University. Drawing on the Theory of Reasoned Action, the research examines factors influencing AI adoption among students, including usage patterns, awareness levels, privacy concerns, and academic integrity considerations. Data were collected through a structured questionnaire from 255 students across various social science departments. The study employed regression analysis to test two models: factors influencing attitudes toward AI and determinants of behavioral intentions to use AI. Results reveal that AI tool usage ( $\beta = .423, p < .001$ ) and awareness ( $\beta = .198, p = .001$ ) significantly predict positive attitudes toward AI. Contrary to previous research, privacy concerns positively correlated with favorable AI attitudes ( $\beta = .170, p = .011$ ). Students strongly support AI integration in education for improving efficiency (mean = 3.90) and work quality (mean = 3.67), while expressing the need for clear regulatory frameworks (mean = 3.78). The findings highlight a gap between AI usage and comprehensive understanding, suggesting the need for structured AI literacy programs. The study contributes to understanding AI adoption in higher education and provides recommendations for policy development that balances technological innovation with academic integrity and ethical considerations.

*Keywords:* Artificial intelligence; higher education; student perceptions; academic integrity; privacy concerns; technology adoption; social sciences education

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## Introduction

The emergence of artificial intelligence (AI) as a disruptive technology in higher-education institutions is revolutionizing the teaching and learning landscape in global academic institutions. In the context of implementing AI in education, understanding how stakeholders perceive this transformative technology is critical for developing effective integration strategies that balance the wonders of technology with the value of holistic and community-based education.

Education has continued to be a cornerstone of the Sultanate of Oman's national development program, contributing to both individual progress and the wider development of the country's economy. The Sultanate has expressed considerable concern for excellence in education via holistic policy establishment that favors equitable access to quality education and, more importantly, incorporates technology as a vehicle of promoting critical thinking and entrepreneurial skills in the younger generation of students (Al-Maskri et al., 2012; Alzadjali, 2019). In this context, the rise of AI technologies presents both new possibilities and complex challenges that require analysis and evidence-based policy making.

Although the use of AI technologies in educational settings has been increasing, little is known about how students, as the main stakeholders of these tools, perceive, adopt, and integrate them into their academic interactions. The research conducted so far has tended to adopt an institutional perspective (university as an entity) and focus on technical implementation barriers. However, the students' comprehensive perspective—covering usage, attitude, privacy, and ethics in an integrated manner—or their models have not been widely explored based on integrated theories of technology acceptance (Dwivedi et al., 2023; Cardon et al., 2023).

In the existing research literature, there is a limited understanding of how AI is adopted in higher education. In contrast, studies tend to focus on specific aspects such as frequency of use (Chan and Hu, 2023), privacy concerns (Al-Zahrani and Alasmari, 2024) or academic integrity implications (Zhou et al., 2024), they have not identified how all these factors operate together to shape student attitudes and behavioral intentions toward the use of AI in teaching. In addition, studies in Middle Eastern and Gulf environments are significantly understudied and these geographical and cultural discrepancies underscore how AI is adopted in the diverse educational contexts around the world.

This gap is significant as student perceptions are central to successful technology integration. Holmes et al. (2022) highlight that successful AI integration needs inclusive frameworks from different stakeholders' perspectives, and Michel-Villarreal et al. (2023) state that sustainable AI implementation in education needs to be based on end-users' perceptions and attitudes. A significant limitation of existing educational technology literature is the lack of well-grounded, theoretically informed research on student perceptions of AI integration.

Social science students are an important group to consider when discussing the adoption of AI because their disciplines emphasize critical thinking, ethical reasoning, and human-centered approaches in tech-based solutions—skills and attitudes vital for understanding AI's broader significance in academic life. Moreover, the perspectives of social science students could

be especially valuable in developing comprehensive AI integration strategies, serving as a bridge between technical and humanistic views on technology adoption.

To fill this gap in the literature, this study examines social science students' perceptions of AI adoption at SQU in depth. Based on the Theory of Reasoned Action (TRA), the study also seeks to determine how various factors—AI tools usage, awareness and knowledge of AI, privacy concerns, perceived opportunities and challenges, and academic integrity considerations—cumulatively shape student attitudes and intentions to use AI in educational settings.

The study contributes to existing research in a number of specific ways. One, it stems from a theoretically robust and in-depth, multi-faceted understanding of various drivers and barriers to using AI that is unlike the linear analyses of individual factors. Second, it adds to the empirical evidence from the Gulf area, filling in the geographical void of AI ed research. Third, it provides policy-relevant reflections that support data-driven decision-making for the integration of AI into higher education institutions.

To be more specific, this study addresses three key research questions: (1) What influences students' attitudes towards use of AI in education? (2) What factors determine students' intention to use the AI tools for their academic work? (3) What are students' perceptions about opportunities and challenges and ethical considerations related to the use of AI in higher education? These objectives are implemented with an in-depth 6D survey tool, specifically created to measure the multi-faceted use of AI in educational environments.

The results of this paper are expected to provide valuable insights for educators, policymakers, and institutional leaders to develop best practices, ethical standards, and student-centered engagement methods for incorporating AI in higher education. As AI systems continue to advance and become more integrated into young people's education, it is essential to explore students' perspectives to guide sustainable and effective integration strategies that consider learning goals, the concept of the educated individual, and ethical technology use.

## **Literature Review**

In recent years, the introduction of AI technologies in higher education has generated significant scholarly interest, particularly in relation to student attitudes toward AI implementation. This paper reviews the literature on key topics shaping students' experiences with AI in higher education, including how students perceive AI in academia, how they use AI as a study aid, their attitude to it, how their personal information is collected and used by AI, and ultimately, factors influencing students' adoption of AI tools. The following themes underpin students' engagement with AI-powered technology in educational settings.

### ***Student Perceptions and Attitudes Toward AI in Education***

Studies on student perspectives toward AI in education have progressed significantly. Early research found both positive attitudes and emerging skepticism. Chan and Hu (2023)

conducted a pioneering study with 399 students from various fields in Hong Kong, which generally showed a positive outlook toward generative AI, with similar average acceptance scores as those in the adapted technologies (ranging from 3.85 to 4.15 on a 5-point scale). This research established a baseline for student AI acceptance and identified factors associated with favorable attitudes, such as perceived usefulness in personalized learning and academic support.

The positive trends have been confirmed through further large institutional research, but subtle variations have emerged. Wells et al. (2024) examined 2,555 students from the University of Liverpool and identified that 93% of them had some knowledge of generative AI technologies. Specifically, 54% preferred tools like Grammarly, and 70% would not want to use ChatGPT to write an entire essay. This study highlights the need to differentiate between the strained relationship seen across AI applications when analyzing student perceptions.

The literature on student attitudes is grounded primarily in technology acceptance models. Cabero-Almenara et al. (2024) also showed that students with constructivist learning beliefs are more accepting of AI tools, and those who emphasize traditional pedagogical approaches are more resistant. This result indicates that fundamental educational philosophies play a role in the acceptance of AI.

A study showed that student acceptance drivers fall along several dimensions. Personalized learning support is highest in importance, with scores ranging from 4.12 to 4.35 on a five-point scale (Chan & Hu, 2023). Learners value most AI's availability 24/7, accurate and immediate feedback, and ability to adapt learning paths based on individual progress. Another valuable dimension is academic support, the mean word importance values of which range from 3.74 to 4.18, including writing support, research help, and citation support.

But alongside these positive attitudes, there are also major resistance factors. Concerns about academic integrity affect approximately half of students, stemming from uncertainty about plagiarism detection difficulties and unclear boundaries of use (Wells et al., 2024). Students are also worried that AI will take the place of human touch, with average concern ratings of 4.24 to 4.47 for existing connections in learning.

Demographic differences in attitudes also become significant. The acceptance levels increase especially among younger students aged 18–24 years. “Closer to AI” Generation Z students feel more comfortable with the inclusion of AI than older students (Cabero-Almenara et al., 2024). This variation is largely driven by field of study effects; STEM students have a 63.8% acceptance rate compared to their humanities peers, with only 0.2% expressing ethical concerns about AI taking over human creativity and critical thinking.

Cross-cultural research shows that different attitudes are found in different pedagogical situations. Western studies highlight concerns about privacy and academic integrity, while Asian studies report the acceptance of the authority of AI and a focus on efficiency gains (Chan & Hu, 2023). Such cultural differences have important implications for institutions with diverse student groups, raising questions around the way AI should be implemented in a culturally sensitive manner.

### *AI Usage Patterns and Applications in Academic Contexts*

Recent studies on the use patterns of AI indicate its rapid acceptance among students and their sophisticated ways to integrate it. Recent large-scale analyses suggest 92% of students in the UK and 86% worldwide are currently using AI tools (Chronicle of Higher Education, 2024), up from only 66% in early 2024. Lifetime prevalence is 24–25%, and 54% report working with AI at least weekly on a variety of academic assignments.

Meta-analytic studies provide strong evidence for AI's usefulness in education. The current analysis includes a set of 51 studies (Wang and Fan, 2025). They found that ChatGPT had a large positive effect on learning effectiveness ( $g = 0.867$ ), a significant positive effect on learners' perceptions ( $g = 0.456$ ), and higher-order thinking skills ( $g = 0.457$ ). These effect sizes show meaningful knowledge improvement when AI tools are effectively integrated into learning. The AI applications most frequently used in academic scenarios include explaining complex concepts, summarizing academic articles, guiding research ideas and methodologies, providing grammar checking and writing aid, assisting with early drafts and outlines, and offering help with assignments and problem-solving. ChatGPT leads the way as the favorite tool, followed by the most popular use-cases, which arise from Grammarly as a writing assistant, Microsoft Copilot for productivity-related jobs, and niche products like Paperpal and Jenni for academic-related help (Wang and Fan, 2025; Wells et al., 2024).

Disciplinary differences in usage patterns reveal important variations in AI adoption. Computer Science students comprise 46.5% of AI users despite representing only 5.4% of degree programs, indicating intensive adoption in technical fields (Von Garrel and Mayer, 2023). STEM fields collectively account for 70.5% of AI usage, with engineering students showing the highest usage rates at 11.3%. In contrast, humanities students use AI at a rate of 9.9%, with greater concerns about its appropriate use, while healthcare and medicine students show usage rates of 5.6% due to concerns about accuracy and liability.

Students develop nuanced strategies to incorporate AI support while upholding academic integrity. Effective approaches also include well-integrated methods (27% of students' responses), which involve embedding AI tools into learning processes and critically analyzing their outputs. Moderate or controlled use (14% of responses) involves AI serving as a support in learning without replacing human interaction and critical thinking. Information refinement (14% of responses) is the process of comparing AI outputs with authoritative academic sources (Li et al., 2024).

AI usage patterns reveal academic integrity challenges, a significant concern. Studies show that 18% of students include AI-generated text in their papers, and 51% are likely to continue doing so even if it violates their institution's policy (White, 2023). However, 88% rely on AI for revision preparation and study aids, which raises difficult policy questions for universities trying to balance the benefits of technology with maintaining academic integrity.

### *Privacy Concerns and Digital Literacy*

Student privacy and digital literacy are essential in shaping AI adoption in education. Chan (2023) conducted pioneering work on AI policy requirements in higher education from students' and teachers' perspectives by surveying 457 students and 180 teachers in Hong Kong universities. We identified ten key focus areas for AI policy development (e.g., privacy and transparency of algorithms, institutional responsibility) and recommended an AI Ecological Education Policy Framework across pedagogical, governance, and operational dimensions accordingly.

New studies suggest a limited willingness for privacy among students. Brown et al. (2021) indicate that students actually care about privacy when they understand how their data is collected and used. They found that “optimistic bias” influences student attitudes, where students are concerned about privacy issues for society but do not believe they are personally at risk, leading to conflicting protective behaviors.

Results from digital literacy assessments indicate that students have misguided perceptions of what AI can and cannot do. Laupichler et al. (2023) identified significant differences in AI literacy among German university students, with most showing very low levels of knowledge about AI. Using their validated evaluative tool, they discovered that students had knowledge gaps related to algorithmic decision-making, data privacy consequences, and the limitations of AI systems, which hindered their ability to use AI tools effectively and safely.

Studies on dependence effects have shown that when an AI system is overused, users can lose the ability to think critically or make decisions. Learners are challenged to evaluate the credibility of AI and recognize algorithmic biases, which may degrade the analytic and evaluative skills required for academic proficiency (Zhai et al., 2024). These results highlight the importance of ICT courses that promote both operational concepts and cognitive skills in the use of digital tools.

Efforts to obtain informed consent and ensure transparency remain a persistent obstacle to deploying AI in education. Skulmowski (2025) highlighted serious issues with obtaining meaningful (informed) consent for AI-driven educational research, as AI technology is too complex for traditional consent to be sufficient. The study recommends dynamic consent models that adapt to changes in AI, along with ongoing transparency about data collection and usage.

Cross-cultural studies of privacy indicate substantial differences in privacy expectations and in regulatory strategies between various educational settings. Western research highlights individual privacy rights and the request for transparent AI technologies, whereas Asian research demonstrates an acceptance of AI authority and prioritizes efficiency gains through privacy protection (Al-Zahrani and Alasmari, 2024). The cultural differences have significant consequences in the context of transnational educational cooperation and student exchange.

### *Factors Influencing AI Adoption Intentions*

Theoretical background for AI adoption intention in education context: The existing theoretical framework, the Technology Acceptance Model (TAM), is based on research that adopts TAM as the theoretical framework with some modifications to its principal factors because AIs have different features compared to traditional technologies. TAM has the highest applicability and consistently identifies perceived usefulness as a strong predictor of adoption intentions in educational settings as well (Almaiah et al., 2024). Expanded TAM applications include AI-specific constructs, such as confidence in the decision of an artificial intelligence agent (i.e., AI), anxiety toward it, perceived level of its own “intelligence,” and trust in the system.

The Theory of Reasoned Action (TRA) has been used to provide useful insights into AI adoption. In a study of 150 academics, an investigation into the factors that influenced AI writing tools use found that attitude ( $\beta = 0.472$ ,  $p < 0.001$ ) and subjective norms ( $\beta = 0.588$ ,  $p < .05$ ) significantly affected the intention to adopt AI, as measured by attitudes toward its usage behavior (Al-Suqri and Al-Kharusi, 2015). The Theory of Planned Behavior expands on TRA by adding perceived behavioral control, showing that self-efficacy and resource availability significantly moderate the relationship between intentions and actual AI-use behavior.

The Unified Theory of Acceptance and Use of Technology (UTAUT) has higher predictive power in Complex Learning Environments. One study conducted between 2008 and 2022 indicates that performance expectancy had the most significant impact on behavioral intention in higher education, followed by effort expectancy, social influence, and facilitating conditions (Xue et al., 2024). Extensions of UTAUT2, including hedonic motivation, price value, and habit, better fit the model, whereas trust and privacy prove to be additional essential constructs for AI technologies.

AI-specific variables significantly improve traditional technology acceptance models. Key predictors that remain consistently significant are perceived usefulness and performance expectancy, which are the strongest predictors. Trust plays a crucial role in AI-specific applications, while social influence and subjective norms are significant in academic settings. Facilitating conditions are vital for actual usage, and attitudes toward AI serve as a mediating factor in other relationships (Li et al. 2024).

The negative relationship between AI anxiety and adoption intentions remains relatively stable, while the positive relationship between AI confidence and usage intention appears quite minimal. Readiness toward AI refers to the degree of preparedness in using the technology, whereas perceived AI intelligence is associated with perceptions of usefulness. Ethical concerns are significant moderators of adoption decisions, especially among humanities and social science students (Kim et al., 2025).

There are significant differences in the intention to adopt due to demographic characteristics. Younger students also exhibit stronger adoption intentions and there are mixed gender results—some studies supporting a male preference for self-expression through technology while others find no significant differences. STEM disciplines lead in the use of AI

compared to humanities and social sciences, with early career researchers being more likely adopters than their senior colleagues (Xue et al, 2024; Kim et al., 2025; Li et al., 2024).

Cross-cultural validation research shows that basic theoretical groups are preserved across different cultural settings, though their interpretations of importance vary. Stronger social influence effects are observed in collectivist cultures, with power distance affecting authority roles in adoption decisions and uncertainty avoidance influencing risk perception regarding AI use (Xue et al, 2024).

### ***Significance of the Study***

As the use of AI in education has increased, especially with the rise of generative AI tools, a need to explore the implications of using these systems in education has emerged. It became important to investigate the current practices in the area and establish policies that regulate the use of AI tools. AI tools have allowed students and researchers to generate large quantities of text. However, using AI in such a way is considered unethical and leads to academic misconduct as this generated text does not reflect the actual skills of the students and also might contain inaccurate information.

The study's significance arises from the role of the educational system in the country's future. Quality education arises from a fair and credible educational practice that considers graduating students with skills that align with market needs. However, the use of AI in education might endanger the integrity of the educational process and compromise the whole educational system.

The importance of the study is represented in the need to unveil the current ethical practices among faculty of Arts students while dealing with AI. Hence, determining such practices will eventually lead to better ethical use of AI tools in academia and improve educational outputs.

### ***Aims of the Study***

This paper aims to broadly investigate the infusion of AI in higher education experiences of Sultan Qaboos University students. This research sheds light on different academic considerations regarding adopting AI and could be useful for policymakers, educators, or institutions when deciding how to adopt AI technologies into education ethically. The aims of this study are to:

1. Assess students' attitudes and awareness of AI-driven learning design and its effects on academic honesty, privacy, and data protection.
2. Examine how students view the opportunities and challenges of adopting AI in education, such as improving learning outcomes and promoting academic fairness.
3. Explore determinants that impact the intention of students to use AI in their future academic work and provide suggestions for ethical and effective utilization of AI technologies directed at Sultan Qaboos University.

## ***Research Hypotheses and Theoretical Framework***

The study's hypotheses were established based on the Theory of Reasoned Action (TRA), which we considered the best theory to address the research aims (Al-Suqri & Al-Kharusi, 2015; Shehata & Alnadabi, 2022) in addition to previous literature on technology adoption in educational contexts.

TRA was adopted as the theoretical framework for this study as it effectively explains how attitudes influence behavioral intentions, particularly in contexts of technology adoption. Hence, two sets of hypotheses were formulated to examine (1) factors influencing students' attitudes toward AI and (2) determinants of students' intentions to use AI in educational settings.

### Model 1: Factors Influencing Attitudes Toward AI

#### **H1: AI Tool Usage → Attitudes Toward AI**

Higher levels of AI tool usage and applications positively influence students' attitudes toward AI in education.

#### **H2: Awareness and Knowledge → Attitudes Toward AI**

Greater awareness and knowledge of AI applications positively influence students' attitudes toward AI in education.

#### **H3: Privacy and Security Concerns → Attitudes Toward AI**

Higher levels of privacy and data security concerns negatively influence students' attitudes toward AI in education.

### Model 2: Determinants of Behavioral Intentions

#### **H4: AI Tool Usage → Behavioral Intentions**

Higher levels of AI tool usage and applications positively influence students' intentions to use AI in the future.

#### **H5: Awareness and Knowledge → Behavioral Intentions**

Greater awareness and knowledge of AI applications positively influence students' intentions to use AI in the future.

#### **H6: Attitudes → Behavioral Intentions**

More positive attitudes toward AI positively influence students' intentions to use AI in the future.

#### **H7: Opportunities and Challenges → Behavioral Intentions**

Perceived opportunities and challenges associated with AI use influence students' intentions to use AI in the future.

## H8: Academic Fairness and Integrity → Behavioral Intentions

Perceptions of AI's role in academic fairness and integrity influence students' intentions to use AI in the future.

### Methodology

This study aimed to analyze the factors influencing the use of AI tools among humanities and social sciences students at Sultan Qaboos University, focusing on their attitudes, knowledge, and intentions related to AI in education. A quantitative research design was used, employing a structured questionnaire to collect data from a representative sample of students through an in-person survey, using random sampling to ensure diversity. The researchers designed a questionnaire that consisted of seven sections. The questionnaire aimed to measure the Use and Applications of AI in Education, Awareness and Knowledge, Attitudes and Personal Standards, Privacy and Data Security, Opportunities and Challenges, Academic Fairness and Integrity, and Future Intention to Use.

The questionnaire was pretested with a small group of social science and humanities students to ensure clarity and validity. After revisions, the final version was distributed using students' emails, which resulted in the retrieval of 255 valid questionnaires (Table 1). We limited data collection to academic departments that fall under the social sciences and humanities disciplines. The collected data was coded and analyzed using SPSS software, and then data were analyzed using descriptive statistics to summarize demographic information, and patterns of AI usage, t-tests, and ANOVA were employed to examine differences between subgroups within the sample based on demographic factors.

**Table 1**  
*Demographic Characteristics*

Variable	Categories	Frequency	Percentage
<b>Gender</b>	Male	112	43.9
	Female	143	56.1
	<b>Total</b>	<b>255</b>	<b>100%</b>
<b>College</b>	Information Studies department	43	16.9
	Sociology department	14	5.5
	Law	26	10.2
	Economics department	40	15.7
	Psychology department	7	2.7
	English language department	61	23.9
	Geography department	45	17.6
	Media Studies department	16	6.3
	Music department	3	1.2
<b>Total</b>	<b>255</b>	<b>100%</b>	
<b>Academic Level</b>	First year	34	13.3
	Second year	35	13.7
	Third year	48	18.8
	Fourth year	69	27.1

Fifth year	17	6.7
Six year	9	3.5
Seventh year	6	2.4
Postgraduate	37	14.5
<b>Total</b>	<b>255</b>	<b>100%</b>

This approach enabled a comprehensive analysis of the factors influencing students' engagement with AI tools in education. The methodology provides valuable insights into the key elements affecting AI adoption in higher education, offering a foundation for future strategies and policy development to enhance AI integration in academic environments.

Correlation and regression analyses were conducted to explore relationships between variables, particularly focusing on the hypothesized relationships outlined in the study's conceptual framework. These relationships included the impact of expected AI use and awareness on attitudes toward AI use, the influence of comfort and privacy concerns on subjective norms, and the effects of attitudes and subjective norms on behavioral intention to use AI. Additionally, the study examined how perceptions of academic fairness and integrity related to both attitudes and behavioral intentions regarding AI use in education.

## Data Analysis

Descriptive statistics were used to analyze the data, summarizing demographic characteristics and AI tool usage patterns. Results were effectively presented in tables and graphs, aiding interpretation. This allowed for a deeper understanding of key factors that may influence student engagement with AI tools for learning.

### *Reliability Results*

The analysis's results are summarized in Table 2 below, which provides the number of items in each section along with their corresponding Cronbach's Alpha values.

**Table 2**

*Cronbach's Alpha Reliability Analysis*

<b>Section</b>	<b>Dimensions</b>	<b>No. of items</b>	<b>Cronbach's Alpha</b>
<b>1</b>	AI Tool Usage and Applications	6	0.859
<b>2</b>	Awareness and Knowledge	4	0.769
<b>3</b>	Attitudes and Personal Standards	4	0.828
<b>4</b>	Privacy and Data Security Concerns	4	0.750
<b>5</b>	Opportunities and Challenges	4	0.691
<b>6</b>	Academic fairness and integrity	4	0.655
<b>7</b>	Intentions for Future AI Use	4	0.823
<b>Total</b>		<b>30</b>	<b>0.941</b>

As the table demonstrates, the reliability analysis showed varying degrees of internal consistency across the sections of the questionnaire. The AI Tool Usage and Applications section

demonstrated the highest reliability ( $\alpha = 0.859$ ), followed by Opportunities and Challenges ( $\alpha = 0.691$ ) and Academic Fairness and Integrity ( $\alpha = 0.655$ ), with the latter two remaining within acceptable ranges despite being lower. Notably, the overall questionnaire achieved high reliability ( $\alpha = 0.941$ ), confirming its effectiveness in measuring students' AI usage patterns, awareness, and attitudes.

### *AI Tool Usage and Applications*

According to the data presented in Table 3, the respondents generally agree on the benefits of using AI tools for various academic tasks, with the highest mean score (3.90) indicating that AI saves time and effort in completing academic assignments, followed by agreement that AI improves work quality (mean = 3.67). Students also agree they regularly use AI tools for lecture preparation and projects (mean = 3.63) and understanding complex topics (mean = 3.66), while their use of AI for searching academic sources shows slightly lower agreement (mean = 3.49). The only neutral response relates to using AI for summarizing articles and lectures (mean = 3.36), suggesting that while students generally have a positive attitude toward AI tools in academic work, they show less enthusiasm for its summarization capabilities.

**Table 1**

#### *AI Tool Usage and Applications*

#	Statement	Mean	Std.	Decision	Rank
q1.1	I regularly use AI tools to prepare lectures and academic projects	3.63	0.912	Agree	4
q1.2	Using AI saves me time and effort in completing my academic tasks	3.9	0.944	Agree	1
q1.3	I use AI applications to search for academic sources	3.49	1.034	Agree	5
q1.4	AI helps improve the quality of the academic work I submit	3.67	0.976	Agree	2
q1.5	I use AI tools to summarize articles and lectures	3.36	1.037	Neutral	6
q1.6	I use AI tools to facilitate understanding of complex topics	3.66	1.034	Agree	3

### *Awareness and Knowledge*

Regarding students' awareness and knowledge of AI (Table 4), the analysis of students' awareness and knowledge of AI in education reveals moderate understanding levels. Students demonstrated awareness regarding AI-related risks (mean = 3.45), particularly concerning privacy, ethics, and data security implications. However, they showed neutral comprehension of fundamental AI concepts (mean = 3.25) and limited ability to differentiate AI from other educational digital tools (mean = 3.32). Similarly, students expressed uncertainty about whether AI tools require specialized technical skills (mean = 3.30). These findings suggest a need for enhanced educational initiatives to improve students' understanding of AI technology, its unique

characteristics compared to traditional tools, and the technical competencies required for its effective use in academic settings.

**Table 2**

*Awareness and Knowledge*

#	Statement	Mean	Std.	Decision	Rank
q2.1	I am fully familiar with the concept of AI and its applications in education	3.25	0.829	Neutral	4
q2.2	I know enough about the difference between AI and other technologies used in education	3.32	0.983	Neutral	2
q2.3	I believe using AI in education requires special technical skills	3.3	0.971	Neutral	3
q2.4	I am sufficiently aware of the potential risks of using AI in education	3.45	0.995	Agree	1

*Attitudes and Personal Standards*

In terms of attitudes and personal standards, the results of the analysis (Table 5) showed that the respondents expressed positive attitudes toward AI, with most statements falling into the “agree” category. The highest mean score (3.73) reflects agreement that AI use should be an integral part of higher education curricula, indicating strong support for embedding AI into academic systems.

Respondents also agree that their peers encourage the use of AI (mean = 3.63) and that AI enhances their academic efficiency (mean = 3.57). These findings highlight a general perception that AI not only improves academic performance but is also socially supported within the student community.

Additionally, students feel comfortable using AI to complete academic tasks (mean = 3.42), although this ranks lowest among the four statements, suggesting that while students are comfortable with AI, there may still be some hesitancy compared to other aspects of AI use.

**Table 3**

*Attitudes and Personal Standards*

#	Statement	Mean	Std.	Decision	Rank
q3.1	I feel comfortable using AI in completing my academic tasks	3.42	1.008	Agree	4
q3.2	My peers encourage the use of AI in education	3.63	0.963	Agree	2
q3.3	I believe using AI in education enhances my academic efficiency	3.57	1.017	Agree	3
q3.4	AI use should be an integral part of higher education curricula	3.73	1.009	Agree	1

### ***Privacy and Data Security Concerns***

The findings regarding students' privacy and data security concerns in AI education (Table 6) reveal varying levels of awareness and concern. For instance, the data showed that students strongly agreed on the need for clear privacy policies in AI educational tools (mean = 3.78) and institutional transparency regarding AI implementation and data collection practices (mean = 3.76). While students showed interest in understanding data protection mechanisms (mean = 3.53), they expressed neutral views about potential privacy risks associated with AI tools (mean = 3.11). These findings suggest that while students prioritize institutional accountability and transparency in AI implementation, they may lack a comprehensive understanding of specific data security risks, highlighting the importance of educating students about the potential privacy implications of AI technology in educational settings.

**Table 4**  
*Privacy and Data Security Concerns*

#	Statement	Mean	Std.	Decision	Rank
q4.1	Using AI tools may expose my personal data to risks	3.11	1.046	Neutral	4
q4.2	I am interested in knowing how my personal data is protected when using AI tools	3.53	1.071	Agree	3
q4.3	There should be clear policies to protect privacy when using AI in education	3.78	0.984	Agree	1
q4.4	Universities should be transparent about how AI tools are used and what data is collected	3.76	0.941	Agree	2

### ***Opportunities and Challenges***

In Table 7, the analysis of opportunities and challenges in AI education reveals a balanced perspective among students. The students strongly agreed that AI presents opportunities for improving educational quality (mean = 3.66) and fostering creativity and self-learning (mean = 3.64). However, students maintained neutral stances regarding technical literacy barriers (mean = 3.38) and legal-ethical challenges (mean = 3.30). These findings suggest that while students are optimistic about AI's potential to enhance education and promote innovation, they don't perceive technical competency requirements or legal-ethical considerations as significant barriers to AI adoption, indicating a pragmatic approach to incorporating AI in their educational experience.

**Table 5**  
*Opportunities and Challenges*

#	Statement	Mean	Std.	Decision	Rank
q5.1	I believe using AI in education is an opportunity to improve the quality of education	3.66	0.912	Agree	1
q5.2	The biggest challenge in using AI in education is students' lack of knowledge and technical skills	3.38	0.93	Neutral	3
q5.3	AI application in education opens new horizons for creativity and self-learning	3.64	0.97	Agree	2

<b>q5.4</b>	Legal and ethical challenges may hinder the application of AI in education	3.3	0.991	Neutral	4
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### *Academic Fairness and Integrity*

As the data below suggests (Table 8), students' perceptions of academic fairness and integrity regarding AI are equally mixed. Students do not deny the need to leverage AI to maintain integrity in academics, yet there are apprehensions regarding its effect on fairness and cheating reduction.

“Establishing laws and policies to regulate AI use is necessary to ensure academic integrity” had the highest mean score of 3.78, making it clear the extent to which students agree that regulatory frameworks are essential in protecting the quality of higher education.

Students deem AI to have a more positive potential impact on academic integrity when it is analyzed for unoriginal work (mean = 3.47). This implies that they regard AI-based tools for detecting plagiarism and authenticating academic tests as necessary.

However, there appears to be mixed feedback on whether AI promotes fairness in assessments (mean = 3.20) or reduces academic cheating (mean = 3.17). These neutral responses show some ambiguity or skepticism about whether AI can truly be effective in preventing biased evaluations and cheating.

**Table 6**  
*Academic Fairness and Integrity*

#	Statement	Mean	Std.	Decision	Rank
<b>q6.1</b>	I believe AI use enhances academic fairness in assessment	3.2	0.911	Neutral	3
<b>q6.2</b>	AI use reduces cases of academic cheating	3.17	0.992	Neutral	4
<b>q6.3</b>	AI helps improve academic integrity by detecting unoriginal work	3.47	0.841	Agree	2
<b>q6.4</b>	Establishing laws and policies to regulate AI use is necessary to ensure academic integrity	3.78	0.847	Agree	1

### *Intentions for Future AI Use*

According to Table 9, the analysis of students' future intentions regarding AI use in education reveals strong positive inclinations. Students showed highest agreement in their eagerness to learn more about AI tools (mean = 3.75), followed by recognition of AI's inevitable increased role in education (mean = 3.71). They also expressed strong agreement that AI would support their academic goals (mean = 3.67) and demonstrated a clear intention to use AI tools more effectively in the future (mean = 3.64). These consistently high scores across all measures indicate students' proactive approach toward AI integration, their recognition of its growing importance in education, and their commitment to leveraging AI tools for academic success.

**Table 7***Intentions for Future AI Use*

#	Statement	Mean	Std.	Decision	Rank
q7.1	I intend to use AI tools more effectively in my academic future	3.64	0.857	Agree	4
q7.2	Using AI will help me achieve my academic goals	3.67	0.879	Agree	3
q7.3	Increasing reliance on AI in education is inevitable in the future	3.71	0.976	Agree	2
q7.4	I will benefit from learning more about how to use AI tools in education	3.75	0.925	Agree	1

**Regression Analysis**

Building on the descriptive findings and guided by our theoretical framework based on the Theory of Reasoned Action, we conducted regression analyses to examine the factors influencing students' attitudes toward AI and their behavioral intentions to use AI in education. This analysis addresses our research objectives regarding the determinants of AI adoption and provides empirical evidence for our hypothesized relationships.

**Testing the Research Models**

Two regression models were tested: (1) factors influencing attitudes toward AI, and (2) determinants of behavioral intentions to use AI. This two-stage approach aligns with previous research by Chan and Hu (2023) and Zhou et al. (2024), who emphasized the importance of understanding both attitudinal formation and behavioral intentions in technology adoption.

**Model 1: Factors Influencing Attitudes Toward AI**

The first regression model examined factors influencing students' attitudes toward AI in education. The model explained 47.9% of the variance in attitudes ( $R^2 = .479$ , Adjusted  $R^2 = .472$ ,  $F(3,251) = 76.834$ ,  $p < .001$ ), indicating substantial explanatory power as illustrated in Tables 10 and 11.

**Table 8***Model Fit and Statistical Significance*

<b>Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.692 <sup>a</sup>	.479	.472	.58936		
<b>ANOVA<sup>a</sup></b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.063	3	26.688	76.834	.000 <sup>b</sup>
	Residual	87.183	251	.347		
	Total	167.246	254			

**Table 9**  
*Coefficients and Interpretation*

<b>Coefficients</b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.578	.203		2.840	.005
	AI Tool Usage and Applications	.452	.068	.423	6.686	.000
	Awareness and Knowledge	.220	.067	.198	3.275	.001
	Privacy and Data Security Concerns	.180	.071	.170	2.555	.011

The results showed that:

- AI tool usage significantly predicted attitudes ( $\beta = .423$ ,  $p < .001$ ), supporting H1 and aligning with findings from Acosta-Enriquez et al. (2024).
- Awareness and knowledge significantly predicted attitudes ( $\beta = .198$ ,  $p = .001$ ), supporting H2 and confirming Vázquez-Parra et al.'s (2024) findings.
- Contrary to H3 and our expectations based on Al-Zahrani and Alasmari (2024), privacy and security concerns positively predicted attitudes ( $\beta = .170$ ,  $p = .011$ ).

#### Model 2: Determinants of Behavioral Intentions

The second model examined factors influencing intentions to use AI, explaining 60.6% of the variance ( $R^2 = .606$ , Adjusted  $R^2 = .599$ ,  $F(5,249) = 76.736$ ,  $p < .001$ ). The results are outlined in tables 12 and 13.

**Table 10**  
*Model Fit and Statistical Significance*

<b>Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.779 <sup>a</sup>	.606	.599	.46615		
<b>ANOVA</b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	83.374	5	16.675	76.736	.000
	Residual	54.108	249	.217		
	Total	137.481	254			

**Table 11**  
*Coefficients and Interpretation*

<b>Coefficients</b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.322	.189		1.705	.089
	AI Tool Usage and Applications	.259	.056	.267	4.588	.000
	Awareness and Knowledge	-.038	.058	-.037	-.647	.519
	Attitudes and Personal Standards	.329	.051	.363	6.495	.000
	Opportunities and Challenges	.201	.059	.187	3.420	.001
	Academic fairness and integrity	.199	.059	.171	3.379	.001

The analysis revealed:

- AI tool usage positively predicted intentions ( $\beta = .267$ ,  $p < .001$ ), supporting H4
- Awareness and knowledge did not significantly predict intentions ( $\beta = -.037$ ,  $p = .519$ ), failing to support H5
- Attitudes strongly predicted intentions ( $\beta = .363$ ,  $p < .001$ ), supporting H6
- Opportunities and challenges predicted intentions ( $\beta = .187$ ,  $p = .001$ ), supporting H7
- Academic fairness and integrity predicted intentions ( $\beta = .171$ ,  $p = .001$ ), supporting H8

## Discussion

This study offers comprehensive insights into the perspectives of social science students on AI adoption in higher education, presented through a six-dimensional framework. The findings reveal complex patterns of engagement that both support and challenge existing understanding of educational technology integration. Each dimension of our survey contributes unique insights to the broader understanding of AI adoption among social science students at Sultan Qaboos University.

The high levels of agreement that AI saves time and effort and improves work quality align strongly with recent international research demonstrating widespread efficiency gains from AI tools. Vieriu and Petrea (2025) found that 49.4% of engineering students specifically cited timesaving as AI's primary advantage, with students reporting reductions of up to 50% in study

hours when effectively integrating AI tools. This result indicates that students from all disciplines view AI as a core value proposition for academic productivity. The overwhelming consensus that AI can aid in understanding complex topics is consistent with general trends we see in relation to the role of AI for personalized learning. Chan and Hu (2023) found that immediate response availability was rated highly by Hong Kong students. In the same study, personalized feedback capabilities also received high scores. This pattern across educational contexts suggests that AI's ability to provide on-demand explanations addresses a cross-disciplinary student need.

However, the neutral attitude toward AI for summarization tasks reveals a subtlety in students' preferences regarding AI applications. This indicates that students can make nuanced distinctions between AI tasks they find beneficial and those that might not aid their learning. The relatively low enthusiasm for summarization may stem from concerns about passive learning; it could also reflect an awareness that the ability to summarize is a basic academic skill best left for students to develop on their own. The Theory of Reasoned Action explains these usage patterns well, with strong positive attitudes toward efficiency and quality improvements creating highly favorable subjective norms for continued use, while the more cautious approach to summarization shows that students are still reflecting on the role AI should play in their learning.

The low levels of AI awareness found in our survey highlight an educational policy issue caused by the gap between usage and understanding. While students indicated that they had a basic sense of AI safety, their understanding of core AI concepts remains limited and neutral, and they struggle to distinguish digital educational tools that involve AIs from those that do not. This theme reflects documented knowledge gaps in AI literacy studies. Laupichler et al. (2023) observed significant variation in AI literacy among German college students: although they frequently use AI, most only have a basic understanding of its concepts. Their validated survey instrument revealed concerning gaps in understanding how AI makes decisions, the implications for data privacy, and the limitations of AI systems—findings that directly align with our own results.

The dual-process model of cognition provides a theoretical explanation for this gap. Surface-level processing makes risk awareness easily accessible through media exposure and peer discussions, while deep understanding of AI fundamentals requires effortful learning and systematic education. Students can readily articulate concerns about AI risks without necessarily understanding the technical mechanisms underlying these risks.

While our regression analysis demonstrated that awareness and knowledge significantly predicted positive attitudes toward AI ( $\beta = 0.198$ ,  $p = 0.001$ ), this finding should be interpreted with caution, given the moderate levels of awareness observed in our descriptive results. The statistical significance may reflect the relationship between basic risk awareness and attitude formation; however, the moderate awareness levels suggest that a deeper understanding remains limited. This relationship warrants further longitudinal investigation to determine how systematic AI education and knowledge development influence attitude formation over time.

This knowledge gap has important implications for educational practice. Kim et al. (2024) cautioned that students might interact passively with AI without adequate knowledge,

applying AI suggestions without deeper reflection. Our findings suggest that educational institutions should develop comprehensive AI literacy programs that move beyond awareness to foster a functional understanding of AI capabilities and limitations.

Positive attitudes toward AI were observed across all measures, showing that students are prepared for the institutional integration of AI. The strongest agreement is on the role of AI in higher education curricula, which aligns with international research indicating that students are overwhelmingly supportive of institutions adopting AI. For example, Katsantonis and Katsantonis (2024) reported that 65.2% of Greek students agree that universities should provide AI education, while 77.3% believe that future careers will require knowledge of AI. The high consensus on peer influence aligns with the influential role peers play in technology adoption within educational settings. According to the Theory of Reasoned Action, subjective norms (i.e., peer attitudes and behaviors) significantly impact individual intentions. Al-Bukhrani et al. (2025) demonstrated that subjective norms greatly influence AI adoption intentions in academic environments, highlighting why peer recommendation is an important factor in our study.

The results that AI improves academic efficiency reflect broader research on perceived usefulness in technology acceptance models. The Technology Acceptance Model consistently shows that perceived usefulness is the strongest factor influencing technology acceptance intentions, meaning students' perceptions of AI's efficiency benefits provide a solid foundation for continued use. However, the slightly lower agreement with AI comfort suggests that some hesitation may still accompany positive attitudes. This pattern could be due to AI's emerging role in education, where students recognize the benefits but are still adjusting to new ways of learning and working (Ma et al., 2025; Alshammari and Alkhwalidi, 2025).

One of the most theoretically interesting outcomes that our study revealed is a positive association between privacy and security concerns to favorable attitudes toward AI. This result is inconsistent with prior work (e.g., Al-Zahrani and Alasmari, 2024) that reported an adverse effect from privacy concerns on attitudes towards AI. This apparent paradox can be reconciled by well-established models from privacy studies though. The best use is offered by the Privacy Calculus Theory, which suggests individuals weigh risks and benefits when deciding whether to uptake technologies that require sharing personal information. Users may be more likely to consider adopting technology in a privacy-preserving manner when the benefits outweigh the risks.

The Privacy Paradox literature offers some explanation for this result. Dienlin et al. (2023) discovered in a longitudinal study that privacy concerns are often poor predictors of protective behaviors, especially for technologies where utility is very high. Educational environments could be such high-utility settings, where the academic benefits of AI tools outweigh privacy concerns for most students. The fact that we found students care a lot about having clear privacy policies and institutional transparency aligns with this idea as do their neutral opinions on personal data risks. Students seem to understand that privacy matters are essential at the institutional level, but they perceive it as less personally significant when faced with barriers to adopting AI.

In this way, we believe that students' views on AI applications and challenges reflect a form of "technological pragmatism"—that is, their enthusiastic use of technology without ignoring potential obstacles in implementation. This high convergence indicates that students believe in AI's potential to transform the quality of education positively and to create opportunities for creativity and self-learning. These findings align with broader research on the learning benefits of AI. Wang and Fan (2025) presented results from a meta-analysis of 51 studies, showing that ChatGPT has significant positive effects on learning performance but only moderate changes in students' perceptions of their own or others' learning processes, as well as higher-order thinking skills. Students' confidence in the potential for education to improve may be more than just naivety.

But relatively neutral attitudes toward technical literacy barriers and legal-ethical challenges suggest that students do not see these factors as major obstacles to adopting AI. This perspective could reflect their confidence in their ability to adapt and the support from institutions, or it may indicate a lack of understanding of how complex responsible AI implementation can be. The neutral stance on technical literacy barriers sharply contrasts with the clear evidence of AI illiteracy among students, implying that many may underestimate the knowledge and skills required for successful integration.

Student perspectives on academic fairness and integrity reveal complex attitudes toward AI's role in maintaining academic standards. The exceptionally strong agreement on the need for regulatory frameworks demonstrates student recognition that AI integration requires careful governance to preserve educational integrity. This finding receives comprehensive validation from international research. Chan (2023) found that both students and teachers strongly agreed that institutions need AI management plans. The consistency of these findings across different educational contexts suggests that the development of a regulatory framework represents a universal priority for AI integration in higher education.

The neutral responses regarding AI's ability to enhance assessment fairness and reduce academic cheating reflect broader institutional struggles with these concepts. Recent research by BestColleges (2024) found that 51% of students consider AI use in assignments as cheating, while 20% disagree, indicating the conceptual ambiguity our findings capture. This uncertainty suggests that clear guidelines and consistent institutional policies are crucial for helping students understand the appropriate use of AI. However, students do recognize AI's potential for detecting unoriginal work, suggesting awareness of AI's capabilities for maintaining academic integrity through detection rather than prevention.

The strong demand for regulatory frameworks combined with uncertainty about AI's effectiveness in preventing cheating suggests that students view institutional governance as essential for resolving the tensions between AI benefits and academic integrity requirements. This perspective aligns with broader calls for comprehensive AI ethics frameworks in educational settings. The findings also reflect the transitional nature of academic integrity concepts in the age of AI, where traditional notions of original work and appropriate assistance are being challenged by AI capabilities, requiring new frameworks for understanding academic honesty.

The study's findings provide strong support for the Theory of Reasoned Action while revealing important nuances in its application to AI adoption. The significant positive relationships between AI tool usage and attitudes and between attitudes and behavioral intentions confirm TRA's core propositions. However, the unexpected positive correlation between privacy concerns and attitudes suggests that traditional technology acceptance models may require adaptation to account for AI-specific characteristics. The findings also contribute to an understanding of the Technology Acceptance Model in educational contexts, where the strong emphasis on perceived usefulness confirms the central proposition of TAM, while the social influence effects highlight the importance of subjective norms in academic environments.

The study's findings have significant implications for educational policy and practice. The strong student support for AI integration, combined with identified knowledge gaps, suggests that institutions should prioritize comprehensive AI literacy programs alongside the implementation of technology. The regulatory framework imperative indicates that successful AI integration requires clear policies and guidelines developed through inclusive stakeholder engagement. The privacy-attitude correlation suggests that transparency and clear data governance policies may actually enhance, rather than hinder, AI adoption. This indicates that institutions should invest in comprehensive privacy frameworks that address student concerns while maintaining the benefits that drive positive attitudes toward AI tools.

Several limitations should be acknowledged in interpreting these findings. The cross-sectional design limits causal inferences, while the focus on social science students may limit generalizability to other disciplines. The rapid pace of AI development means that student attitudes and usage patterns may evolve quickly, requiring longitudinal research to track changes over time. Future research should investigate the relationship between AI literacy and adoption outcomes, examine disciplinary differences in AI integration patterns, and develop comprehensive frameworks for measuring AI readiness in educational contexts. Cross-cultural validation of these findings would enhance understanding of how cultural factors influence AI adoption in higher education.

This comprehensive examination of social science students' perspectives on AI adoption reveals a complex landscape of enthusiasm tempered by recognition of implementation challenges. Students demonstrate a sophisticated understanding of AI benefits while calling for institutional frameworks to address concerns regarding privacy, integrity, and governance. The findings suggest that successful AI integration requires coordinated attention to technical implementation, educational support, and policy development to realize the transformative potential of AI in higher education while maintaining academic values and standards.

## Conclusion

This study examines the perceptions of social science students regarding artificial intelligence, particularly at Sultan Qaboos University, and aims to understand their attitudes and intentions toward AI adoption. We believe that AI deployment could be very useful in maintaining a fair equilibrium among all stakeholders within academia. It could also expose the promises and perils of AI in higher education, with enormous implications for educational policymakers and practitioners.

The study illustrated that most students believe AI integration improves efficiency and work quality. However, enthusiasm is hindered by the gap between using practical AI solutions and fully understanding how to apply them. The results of this study centered on the tangible reality of student interactions with AI during learning activities and how it influences their beliefs about more general applications of AI in education. A significant result was found regarding the complex interplay between privacy concerns and attitudes toward AI.

Unlike previous research, individuals with higher levels of privacy awareness had more positive views on AI than their peers, indicating that a well-informed engagement with technology is complex and does not always result in negative perceptions. This emphasizes the importance of comprehensive AI education, which should include an understanding of both technical capabilities and ethical responsibilities.

The study also had significant implications for promoting academic integrity and adopting AI technologies. Contrary to the findings of the literature review, students are generally unconcerned about strict AI regulatory frameworks and remain skeptical of AI's effectiveness in reducing academic misconduct. This suggests the need for well-thought-out regulatory policies to maximize the benefits of AI while adhering to academic ethics standards.

The research findings have added to the growing body of literature that paints a more complete picture of this potentially novel paradigm in education. Future research could look into the long-term impact and efficacy of incorporating AI into learning outcomes and effective pedagogy for literacy development consumption among students on this topic (and others), as well as the relationship between usage patterns and academic integrity. This study has several limitations, including the fact that participants were self-selected and that it only focused on social science students at one institution. Future research avenues could include longitudinal institutional or system-level observations following AI adoption across a wide range of subject categories.

Since AI can reshape the learning environments, it is important to understand student perceptions so this change can be well-integrated. It establishes a basis for making choices in AI implementation around the necessity of maintaining ethical and academic standards in step with technological advancement. The outcomes highlight the need for a sensible framework to integrate AI into higher education based on technological potential, student requirements as well as ethical concerns together with institutional pressures.

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## **Declarations**

### ***Ethical Approvals***

This research was conducted in strict adherence to ethical standards and received full approval from the Sultan Qaboos University Research Ethics Committee (Approval number: 2024-09-10). The university reviewed and approved the study protocol, confirming that the research posed minimal risk to participants and was conducted in compliance with ethical guidelines, including the Declaration of Helsinki and institutional regulations governing research involving human participants.

### ***Informed Consent***

Informed consent was obtained from all participants prior to their involvement in the study. Potential participants were approached through official university communication channels, where they were provided with comprehensive information about the study's objectives, procedures, and their rights as participants. All participants completed a consent form, available in Arabic, agreeing to participate, to use their data for research purposes, and to publish anonymized findings. They were informed of the confidentiality of their responses, the aggregation of data for analysis, and their right to withdraw from the study at any time without consequence. All documentation and data collection procedures were conducted in accordance with institutional guidelines for protecting participant privacy and data security.

### ***AI Use Statement***

Generative artificial intelligence (AI) was used in the preparation of this manuscript for grammar and style refinement. The AI tool was not used to generate, analyze, or interpret research data, nor to create original scholarly content. All content was reviewed, verified, and approved by the authors, who take full responsibility for the accuracy and integrity of the work.

### ***Competing Interests***

All authors declare no competing interests.

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