

Demographic influences on university students' attitudes towards artificial

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Abstract <p>Recent studies conducted with university students show that attitudes towards artificial intelligence (AI) can vary significantly based on demographic variables such as gender, age, education level and field of study. This study aims to understand the attitudes of students at the University of Shkoder, regarding artificial intelligence (AI) and to identify the possible variables that influence these attitudes. The research employs a descriptive research design, according to the quantitative approach. A sample of 170 university students, including 144 females and 26 males, was selected using non-probability sampling due to convenience. The AI attitude scale (AIAS-4) developed by Grassini in 2023, administered online, was used for data collection. The results indicated that female students display a more positive attitude towards AI compared to their male colleagues. Moreover, our research has proven a significant difference in attitudes towards AI among university students specializing in different branches, with Social Work students showing a significantly positive attitude towards AI compared to other branches. The findings of this study suggested that there are no statistically significant differences regarding AI attitudes among students of different age groups. Furthermore, we examined the influence of educational level on AI attitudes and found no significant difference in attitudes at different educational levels among university students.</p> <p>In conclusion, the study at the University of Shkoder reveals that female students hold a more positive attitude towards AI compared to males. Social Work students show notably positive views. Age and educational levels don't significantly impact AI attitudes among university students. To promote diversity, AI education should be tailored to different fields of study, and ongoing research is crucial for understanding evolving attitudes towards AI.</p>		
Key words:		
artificial intelligence; artificial intelligence attitudes; Ai education; demographic variables; students.		

Introduction

Artificial intelligence (AI) has become a transformative force across industries and academic fields, influencing how societies operate and how individuals engage with technology (Russell & Norvig, 2021). As AI technologies continue to advance, understanding the factors that shape attitudes towards AI becomes increasingly important, especially among university students who represent the future workforce and societal leaders. Positive attitudes towards AI may foster greater acceptance and effective utilization of these technologies, while negative attitudes could hinder their adoption and integration (Grassini, 2023). Consequently, exploring the demographic influences on attitudes toward AI provides a pathway for tailoring AI education and policy-making to address diverse needs and perceptions. From personalized learning systems in education to intelligent medical diagnostics and autonomous transportation, AI has proven its potential to improve efficiency, decision-making, and innovation (Brynjolfsson & McAfee, 2017; Russell & Norvig, 2021). However, its rapid development has also sparked debates surrounding ethical concerns, including algorithmic biases, data privacy, and potential job displacement (Tegmark, 2017; Binns, 2018). As AI becomes increasingly ubiquitous, understanding the attitudes and perceptions of university students—the future leaders, workforce, and educators—toward AI is essential to facilitate its acceptance and integration.

Attitudes towards AI are not uniform and often vary based on demographic variables such as gender, age, education level, and field of study. Gender differences in technology adoption have been well-documented, with females often exhibiting either higher levels of caution or more positive attitudes towards certain technologies, including AI, compared to their male counterparts (Venkatesh et al., 2003). These differences could be attributed to social, cultural, and experiential factors influencing perceptions of technological utility and risks. Similarly, field of study significantly impacts students' attitudes toward AI. For instance, students in social sciences or social work may approach AI with a focus on its ethical implications and potential societal benefits, while students in technical disciplines may emphasize its functionality and innovation (Zawacki-Richter et al., 2019). However, the role of other demographic factors, such as age and education level, in shaping attitudes remains less explored and often inconclusive (Wang et al., 2022). Conversely, students in the social sciences or humanities may be more concerned with its ethical, societal, and cultural implications (Holmes et al., 2019; Zawacki-Richter et al., 2019). These disciplinary differences underline the importance of tailored AI education to address varied perspectives and needs. Despite the growing body of literature, the role of other demographic factors, such as age and education level, remains less conclusive. Some studies suggest younger individuals are more open to technological innovations due to higher exposure, while others emphasize the significance of educational exposure over age (Makransky et al., 2020; Wang et al., 2022).

In this study, we investigate the attitudes of university students at the University of Shkoder toward AI and explore how demographic factors influence these attitudes. Using a quantitative descriptive research design and the AI Attitude Scale (AIAS-4) developed by Grassini (2023), we examine variations in attitudes across gender, age groups, education levels, and fields of study. By addressing gaps in existing research and identifying demographic patterns, this study contributes to the growing body of knowledge on the sociocultural dynamics of AI acceptance.

The findings from this research have practical implications for developing targeted AI education programs and informing institutional strategies to enhance AI literacy. Understanding these attitudes can aid in promoting diversity and inclusivity in AI education and policy-making, ensuring that students from varied academic backgrounds are equipped to engage meaningfully with AI technologies.

By examining the existing literature and conducting empirical research, we seek to address the following research question:

How do gender, age, education level, and field of study shape students' attitudes toward AI?

Methodology

Research Design

This study adopted a descriptive research design within a quantitative research approach to explore university students' attitudes toward artificial intelligence (AI) and the demographic variables influencing these attitudes. This approach was chosen to systematically measure and analyze students' perspectives on AI, providing insights into variations across gender, academic discipline, age, and educational level.

Participants and sampling

The study involved 170 university students from the University of Shkoder, where 144 are females (84.7%) and 26 are males (15.3%). Participants were selected through a non-probability sampling method, specifically convenience sampling, while practical for this study, has limitations in terms of generalizability. To mitigate potential biases, efforts were made to include students from diverse academic disciplines, ensuring representation from fields such as social work, psychology, and physical education.

The inclusion criteria for participants were as follows:

Enrollment as a student at the University of Shkoder during the academic year 2023-2024.

Availability and willingness to participate in an online survey. Basic familiarity with digital technologies to ensure valid responses to the online questionnaire.

Instruments

The AI Attitude Scale (AIAS-4), developed by Grassini (2023), served as the primary tool for measuring students' attitudes toward AI. The AIAS-4 is a psychometrically validated instrument specifically designed to assess perceptions of AI across multiple dimensions, including its societal, ethical, and practical implications. The AIAS-4 consists of 20 items measured on a 5-point Likert scale, where responses range from 1 (strongly disagree) to 5 (strongly agree), with a Cronbach's alpha coefficient of .915. The scale evaluates attitudes along the following dimensions:

1. Social utility: perceptions of AI's potential to address societal challenges.
2. Ethical concerns: concerns regarding the moral implications of AI usage.
3. Practical benefits: views on the efficiency and advantages AI brings to various fields.
4. Personal acceptance: willingness to engage with and trust AI technologies.

For this study, the AIAS-4 was administered online through a survey platform. The online format enabled wide accessibility and ease of participation while reducing logistical barriers. Before distribution, the survey was pilot-tested with a small group of students to ensure clarity and reliability of the instrument in the study's context.

Procedure

Participants were invited via email to complete the online survey. The survey link included a brief description of the study's purpose, an assurance of confidentiality, and an informed consent form. Participation was voluntary, and respondents could withdraw at any point without penalty. The data collection process spanned two weeks, during which reminders were sent to maximize participation. To ensure data quality, incomplete responses were excluded from the final analysis.

Data analysis

The collected data were analyzed using statistical software. Descriptive statistics were used to summarize demographic characteristics and overall attitudes toward AI. Inferential analyses, including t-tests and ANOVA, were performed to examine differences in AI attitudes across demographic groups. The reliability of the AIAS-4 in this sample was assessed using Cronbach's alpha, ensuring the instrument's internal consistency.

Ethical considerations

The study complied with ethical research standards. Participants were assured of their anonymity and the confidentiality of their responses. No personally identifiable information was collected, and all data were stored securely.

Results

The descriptive analysis of the survey data reveals interesting insights about the characteristics of the respondents. Among the students, 15% were male, while the majority, accounting for 85%, were female. This indicates a significant gender imbalance in the sample. The respondents' ages were categorized into several groups, each representing a specific range. The largest age group was 20-21 years old, comprising 41.8% of the respondents. Following closely behind was the 18-19 years old group, accounting for 38.2%. The smaller age groups consisted of 22-23 years old (7.1%), 24-25 years old (4.1%), and those above 26 years old (8.8%). These results suggest that the majority of the respondents were in their late teens to early twenties, with a smaller proportion being older than 25. Among the respondents, 29.4% were studying Psychology, while 42.4% were pursuing Social Work and 28.2% were engaged in Physics education. These findings indicate that Social Work was the most prevalent discipline among the respondents. The analysis revealed that the largest proportion of respondents (51.8%) were in their second year of study. The first-year students accounted for 30% of the sample. The subsequent years had smaller percentages, with 10% in the third year, 2.9% in the fourth year, and 5.3% in the fifth year. These findings suggest that the survey primarily captured the perspectives of second-year students, with fewer respondents in higher academic years.

Independent samples t-test results show a significant difference in AI attitude scores between females and males. The results revealed that female students demonstrated more positive attitudes toward artificial intelligence (M = 73.16, SD = 11.49) compared to male students (M = 66.28, SD = 9.64), $t(167) = 2.823, p < .05$.

Table 1

Mean Scores, Standard Deviation, and t-values of female and male students in relation to artificial intelligence.

Variable	Gender	N	Mean	SD	t (167)	F	P
AI attitudes	Female	144	73.16	11.49	2.823	0.321	.005*
	Male	25	66.28	9.64			

To explore potential differences in AI attitudes across different age groups, an one-way analysis of variance (ANOVA) was conducted. However, no significant differences in AI attitudes ($F(4,165) = 1.145, p > .05$) were found across different age groups.

Table 2

Mean, standard deviation, F and P for age variable in attitudes toward artificial intelligence

Variables	Group	N	Mean	SD	F (4, 165)	P
AI attitudes	18-19	65	71.83	11.70	1.145	.337
	20-21	71	72.73	10.75		
	22-23	12	72.83	11.76		
	24-25	7	63.42	18.98		
	over 26	15	73.60	8.71		

The results of differences in artificial intelligence across different years of study indicated that there are no significant differences in AI attitudes across different groups $F(4,165) = .811$, $p > .05$.

Table 3

Mean, standard deviation, F and P of years of study in attitudes toward artificial intelligence

Variables	Group	N	Mean	SD	F (4, 165)	P
AI attitudes	First	51	13.88	13.83	.811	.520
	Second	89	13.58	11.86		
	Third	17	13.88	11.03		
	Fourth	5	7.00	9.54		
	Fifth	10	8.30	5.77		

ANOVA results reveal a statistically significant difference in AI attitude scores between the three fields of study $F(2,167) = 3.456$, $p < .05$. The results indicated that students of social work exhibited more positive attitudes toward artificial intelligence ($M = 73.76$, $SD = 11.69$) compared to students of psychology ($M = 73.14$, $SD = 9.76$) and physics education ($M = 68.48$, $SD = 12.17$).

Table 4

Mean, standard deviation, F and P for academic discipline in attitudes toward artificial intelligence

Variables	Group	N	Mean	SD	F (2, 167)	P
AI attitudes	Psychology	50	73.14	9.76	3.456	.005
	Social Work	72	73.76	11.69		
	Physics	48	68.48	12.17		
	Education					

Discussion

The findings from this study provide valuable insights into the complex relationship between university students' attitudes toward artificial intelligence (AI) and demographic factors such as gender, academic discipline, age, and educational level. One of the most striking results is the significantly more positive attitude of female students toward AI compared to their male counterparts. This finding aligns with research indicating that women often view AI technologies through a lens of social utility and practical benefits (Grassini, 2023). It reflects broader societal trends wherein women, historically underrepresented in technological fields, are increasingly recognizing the potential of AI to address societal and workplace challenges. Initiatives aimed at fostering gender diversity in AI-related disciplines could build on this trend,

encouraging more women to pursue AI-focused careers and academic pursuits (Brown & Smith, 2021).

The study also highlights that Social Work students exhibit notably positive attitudes toward AI compared to students in fields such as Psychology and Physical Education. This enthusiasm could stem from the practical benefits AI offers to social work practice, including client management systems, predictive analytics for social interventions, and enhanced accessibility of services (Johnson et al., 2022). Social Work students may view AI as a tool to amplify their impact in addressing complex societal issues. This underscores the importance of designing AI curricula that resonate with the specific interests and professional goals of students within particular disciplines. Tailoring AI education to highlight relevant application such as ethical AI use in Psychology or AI-driven performance analytics in Physical Education could enhance engagement and learning outcomes across diverse fields of study.

Interestingly, the results showed no significant differences in AI attitudes among students across various age groups. This finding challenges assumptions that younger students, often labeled as “digital natives,” might have more favourable attitudes toward technology. Instead, it suggests that AI-related attitudes are influenced by factors beyond age, such as exposure to AI applications, personal interest, or perceived relevance to one’s field of study (Nguyen & Walker, 2023). Similarly, the lack of significant differences in AI attitudes across educational levels indicates that exposure to AI may be relatively consistent among undergraduate students, regardless of their academic progression. This consistency raises an important question: Are current AI education strategies adequately preparing students for the complexities of the evolving technological landscape, or do they merely provide a superficial introduction to AI concepts?

The methodological approach used in this study provides a strong foundation for understanding student attitudes but is not without its limitations. The use of convenience sampling, while pragmatic, limits the generalizability of the findings to broader student populations. Moreover, the online administration of the AI Attitude Scale (AIAS-4) might have introduced a selection bias, favouring participants who are more comfortable engaging with technology. Future research should consider employing more diverse sampling techniques and combining quantitative surveys with qualitative methods, such as interviews or focus groups, to capture a richer understanding of student perspectives (Smith et al., 2020).

These findings have significant implications for higher education institutions. The variation in attitudes across academic disciplines highlights the necessity of moving beyond one-size-fits-all approaches to AI education. For instance, Social Work students might benefit from courses emphasizing AI's role in advancing social justice, while Psychology students could explore ethical considerations and cognitive models in AI development. Moreover, the enthusiasm of female students toward AI represents an opportunity to create inclusive and supportive learning environments that encourage their sustained engagement and leadership in AI-related fields (Garcia et al., 2021).

Interdisciplinary learning opportunities could further enrich students’ understanding of AI. Collaborative projects involving students from diverse academic backgrounds may foster a broader appreciation of AI's multifaceted applications while addressing potential gaps in knowledge or perspective. Additionally, longitudinal studies tracking changes in student attitudes over time could provide valuable insights into how exposure to AI in academic and professional contexts shapes perceptions and readiness to engage with AI technologies.

Finally, this study highlights the importance of continuous research into AI attitudes to ensure that educational practices remain aligned with the evolving needs and expectations of students. As AI continues to permeate every aspect of society, understanding and addressing the factors that influence student attitudes will be critical to preparing the next generation for the opportunities and challenges of an AI-driven world.

Conclusion

This study underscores the significant role of gender and academic discipline in shaping university students' attitudes toward AI, while finding no significant impact of age or educational level. Female students and Social Work majors demonstrate notably positive attitudes toward AI, likely influenced by their perception of AI's societal relevance and practical applications. The findings highlight the importance of creating tailored and inclusive educational approaches to AI, emphasizing the need for ongoing research to understand the dynamic interplay between demographic factors and AI attitudes.

Recommendations

Develop AI courses that address the unique needs and challenges of individual disciplines. For example, focus on AI's potential in social justice for Social Work students or its ethical implications for Psychology students.

Design programs and workshops that actively encourage female students to engage with AI, emphasizing its relevance to societal and professional contexts.

Facilitate opportunities for students from diverse fields to collaborate on AI-related projects, promoting a holistic understanding of AI applications.

Conduct longitudinal and mixed-method studies with diverse samples to validate findings and explore additional demographic and contextual variables influencing AI attitudes.

Integrate AI education into core curricula across age groups and educational levels to ensure consistent exposure and engagement with AI concepts.

Identify and mitigate factors that may deter certain groups from engaging with AI, ensuring equitable access and opportunities for all students.

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