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Investigating Students' Attitudes towards Artificial Intelligence in Somalia

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Abstract: As artificial intelligence (AI) becomes more prevalent in higher education, bringing potential benefits, student perceptions of AI, especially in contexts that have been understudied, such as Somalia, are relatively uncharted terrain. In this study, we examined attitudes towards AI among 474 Somali university students, exploring possible links to gender, age, and self-assessed AI experience. The data collection took place during the period from January 23 to February 18, 2025.. Applying a cross-sectional survey approach with convenience sampling through online questionnaires, we first carried out bivariate analyses (Mann-Whitney U, Kruskal-Wallis, Spearman correlation) to examine these relations. Initial analysis revealed no statistically significant differences across gender ($p=0.887$) or age group, nor a significant correlation across AI experience ($p=0.587$). Acknowledging that bivariate tests might not adequately capture multifaceted influences, multivariate analysis using Quade ANCOVA, however, revealed a statistically significant effect of age group on AI attitudes after controlling for AI experience ($p<0.001$), suggesting that older students held more positive attitudes compared to their younger peers. In contrast, gender remained a non-significant predictor even after adjusting for experience. In conclusion, these findings reveal that covariates such as AI Experience must be controlled in the assessment of attitudes towards artificial intelligence. Therefore, AI education programs and awareness studies to be implemented in universities should be structured to take into account the different needs of age groups; in addition, personalised learning strategies should be developed by considering individual experience levels.

Keywords: artificial intelligence; AI attitude; university students; Somalia.

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1. Introduction

Artificial Intelligence (AI) is now an integral feature of contemporary life, from healthcare to education, and industrial production (Rawas, 2024). The last few years have seen its implementation in education, in particular, gaining rapid momentum, as it enables personalised learning, administrative automation, and adaptive feedback systems (Buabbas et al., 2023). As AI's application in education continues to grow, there is an increasing awareness that integration is possible only when it is supported by both access to technological tools and by attitudes and preparedness of the learners as end users (Baigi et al., 2023).

Much of the research conducted concerning student attitudes to AI has been carried out in high-income countries with strong digital infrastructures and high AI literacy, like Finland, Turkey, and China (Silvennoinen et al., 2025; Köse, Şimşek, & Demir, 2025; Du et al., 2024). Such environments contrast sharply with low-income or post-conflict environments, where infrastructural limitations, inequality in the provision of schooling, and socio-cultural factors can strongly influence views about technology. Somalia is a low-income country experiencing all these adversities.

Somalia offers a particularly interesting context in which to study AI attitudes. As a country to emerge from years of civil war, Somalia is in the process of reconstructing its higher-education system, and this system is seriously threatened by such issues as poorly funded public institutions, unevenly applied academic standards, and limited exposure to cutting-edge technologies (Frigerio & Montedoro, 2025). According to DataReportal (2024), Internet penetration in Somalia still languishes at below 30% in much of the country, although urban areas such as Mogadishu and Hargeisa are seeing incremental improvement in digital connectivity.

Despite these limitations, there is visible policy-level interest in digital transformation. Strategies like the Somalia National ICT Policy (2022–2027) itself clearly emphasise AI, data science, and innovation as national imperatives to boost governance, education, and economic development. Moreover, Somali institutions of higher education, particularly private institutions, are increasingly adopting computer science and data analytics as areas of study even in the absence of well-developed AI infrastructure (Isak, Ahmed, & Elamin, 2019). These initiatives form a burgeoning milieu for AI within Somalia as a developing country, which is under-researched and qualitatively different from more intensively examined environments like the US, Canada, and the UK to the West, and China, Japan, and South Korea to the East as developed countries. These areas enjoy strong ecosystems for AI backed by consistent public spending, institutional mechanisms, and well-charted digital infrastructure dynamics, different from most countries in the Global South (Thagard, 2021; Neupane & Sibal, 2021).

Somali culture has strong oral traditions, communal forms of learning, and conservative attitudes towards technological change, factors likely to influence attitudes towards AI. Somali people's rich oral traditions and learning systems based on communities can instil a conservative or resistant disposition when it comes to sudden technological changes, such as artificial intelligence. A lack of written records and reliance on human knowledge transfer can create tension when it comes to contemporary, text-based, and abstruse technologies since communities place a premium on continuity in culture over sudden adaptation (Ali, 2001; Seife, 2020). Of particular concern in fragile economies, where AI benefits tend to be distributed unevenly, are issues of surveillance, job loss, and digital inequality (Lainjo, 2023). As pointed out by Daly et al. (2020), the lack of institutional ability in countries in the Global South to manage the deployment of AI has left them in disproportionate exposure to abusive uses like surveillance and algorithmic job displacement. Somalia, with its poor digital governance and post-conflict infrastructure, is a case in point. Somali perceptions of AI, therefore, can be expected to reflect hope and optimism, doubt and reservation, and ambivalence in ways that high-income country studies often do not.

This research enriches global understanding of how and why economic, infrastructural, and cultural factors mediate access to and adoption of emerging technologies. Adults within Somali society tend to be more deeply rooted in traditional culture than younger generations, as they have

been immersed for an extended period in oral-based traditions, collective systems of learning, and social norms based on structures revolving around clans (Ali, 2001). This embedded culture tends to lead to reluctance when it comes to embracing new, emerging technologies such as artificial intelligence (AI), especially when the technology is seen as posing a threat to traditional social customs. On the other hand, Somali youth, particularly those attending institutions of higher learning, are shown to be more comfortable embracing new technologies (Ahmed et al., 2021). This is contributed to by an increased exposure to internationalised systems of education and digital solutions, which over time erode the power exerted by traditional norms (Seife, 2020). Ongoing reconstruction within Somali higher learning is instrumental in pushing the generation to embrace new technologies, as more and more universities start offering courses in computer science, data science, and AI (Ahmed et al., 2024; Fundi et al., 2024). Kenya, a region similar in structure to Somalia, has studied that the attitude of university students towards AI is generally favourable and is related to factors such as one's generation, gender, and familiarity with digital systems. In this context, it can be said that as they graduate and enter the labour world, they will be expected to be leading agents for technological change, using AI within organisational activities and aiding the nation's development. This shift among generations captures how education acts as an intervening variable between tradition and innovation within post-conflict Somalia. The findings of this study hold particular value to policymakers, educators, and technologists working in post-conflict or low-resource environments. The Somali experience offers insight into how attitudes towards AI develop in areas of insecurity, constrained resources, and rapid digitalisation, and thereby advances theoretical models that to date have largely reflected Global North experiences.

The present study examines university students' attitudes towards AI in Somalia, with emphasis on demographic factors of age, gender, and experience with AI. As Somalia experiences a transitional educational and technological environment, understanding students' views can be used to inform more context-aware AI integration in higher education (Abdi et al., 2025).

2. Literature Review and Hypothesis Development

As AI dominates and is integrated into almost every discipline, including education, it is important to learn how and why students experience this emerging technology (Alzahrani, 2023). The increasing presence of AI in educational environments calls for technological preparedness as much as it does psychological and societal openness, particularly among learners (Derinalp & Ozyurt, 2024). Although previous studies mostly focused on enumerating the advantages of AI, like individualised instruction and administrative convenience (Katiyar et al., 2024), recent critiques warn against ignoring ethical challenges, such as algorithmic bias, surveillance issues, and marginalisation of less technologically savvy populations (Silvennoinen et al., 2025; Cesaro et al., 2024). Therefore, it is insufficient to know whether students hold positive views of AI; it is imperative to investigate why they hold those views, and whether it's informed interaction or superficial exposure.

2.1. Student Attitudes towards AI

Several peer-reviewed articles concur that the attitudes of students play an influential role in engagement with AI-based tools and impact outcomes of learning (Alzahrani, 2023; Baigi et al., 2023). Attitudes, however, do vary and mostly depend on a combination of cognitive, emotional, and cultural factors. For example, although Katiyar et al. (2024) document that adaptive learning systems boost the motivation of students, Stein et al. (2024) hold that personality and experience modify this impact. Likewise, whereas optimism regarding AI's contribution to enhancing education is voiced by some students in some environments, others manifest stress about the protection of data, academic integrity, or reliance on AI-based systems (Silvennoinen et al., 2025; Köse, Şimşek, & Demir, 2025).

Significantly, much of the existing literature either universalises attitudes in abstractions or regionally focuses within Asia and Europe, where access to AI tools is more prevalent. Few studies have investigated how structural injustices like infrastructural scarcity, low digital literacy, or

prevailing values may influence learner perceptions in less-represented environments like Sub-Saharan Africa (Nsyengula et al., 2025; Alzahrani, 2023). Therefore, this study bridges both geographical and conceptual shortcomings by filling the gap of needing to scrutinise attitudes in places where AI is less mainstream but increasingly advocated.

2.2. Demographic Influences on Students' Attitudes Towards AI in Education

2.2.1. Gender Differences

Numerous studies find male students to be more open to technology as a result of increased confidence and exposure (Grassini, 2023). Others highlight the persistence of gender-related anxieties about AI by female students regarding data monitoring and exclusion from technical areas (Cesaro et al., 2024). Ferreira et al. (2025) further suggest that interventions in STEM disciplines at an early level, such as female mentorship and gender-sensitive design, can lower these differentials in due course. Such interventions, however, remain context-specific and may have limited applicability in other cultures or institutional settings. This study is therefore intended to examine whether such gender-based differentials hold in the Somali context, where culture-specific and infrastructural issues can mediate such impacts.

H1a: Students' attitudes towards artificial intelligence significantly differ by gender.

2.2.2. Age-Related Variations

Although Stein et al. (2024) discovered that younger learners (digital natives) tend to be more enthusiastic about AI tools, Dasgupta & Hill (2021) warn that this does not translate to critical literacy. Younger learners can be receptive to AI applications but do not possess the ability to query algorithm fairness or ethical application, and there is concern regarding passive compliance. Moreover, in environments with limited resources, older learners will tend to be more critically conscious as they learn by practical experience of limited access to technologies. Such contradictory findings require investigation in varied education systems.

H1b: Attitudes towards artificial intelligence significantly differ among age groups.

2.2.3. Experience with AI

Some writers describe how direct experience with AI technologies can increase confidence and lower anxiety (Leoste et al., 2021; Katsantonis & Katsantonis, 2024). The views here, however, are now subject to increasing counter-arguments. Tin et al. (2024) recently reported, for instance, that experience itself does not foretell positive attitudes where users have usability issues, opaque algorithms, or irrelevance to their studies. Therefore, the quality of experience, and possibly its duration, may be a better predictor of attitude than duration alone. This research responds to that nuance by inquiring whether years of experience, which is used as a proxy, strongly relate to AI attitudes.

H2: There is a significant correlation between the years of experience with AI technologies and students' attitudes towards AI.

H3: There is a statistically significant difference in AI Attitude scores among the different genders and ages after controlling for AI Experience.

3. Materials and Methods

3.1. Study Design and Participants

This research was designed as a cross-sectional study to address the gap in university students' attitudes towards artificial intelligence. The data collection took place during the period from January 23 to February 18, 2025. The questionnaire was given to students in Google Forms,

and invitations were sent in various channels such as email, WhatsApp groups, and other social media networking sites. The sample of the study (n=474) consists of university students from Somalia. The data were collected from students at two universities in Somalia: Amoud University, which is a public university located in Borama, and City University of Mogadishu, which is a private, not-for-profit university in Mogadishu. The data were collected using an online questionnaire form with a convenience sampling method. Convenience sampling allows for efficient data collection and provides valuable preliminary insights, although it may limit the representativeness of the sample. 474 volunteer university students of various departments, representing a range of ages and genders, were selected at random for this study. Overall, 51.3% of students were male and 48.7% were female. The characteristics of the students selected for this study are displayed in Table 1. This table shows that 46.6% of students were in the 18–20 age range, 43.7% were in the 21–23 age range, 7.2% were in the 24–26 age range, and 2.5% were over the age of 27. On the other hand, regarding AI experience, the majority of students had 1-3 years of AI experience (n = 356, 74.9%), while the least experienced group consisted of those with more than 10 years of AI experience (n = 14, 2.9%). This suggests that most participants are relatively new to AI, with only a small part having extensive experience. Regarding faculty distribution, the highest representation came from Business students (n = 222, 46.7%), followed by ICT students (n = 123, 25.9%). Conversely, the lowest participation was observed among students from Banking and Finance (n = 8, 1.7%) and Agriculture (n = 9, 1.9%).

Table 1. Demographic Profile of Participants (n= 474)

Variable	Category	Frequency	Percentage
Gender	Male	243	51.3
	Female	231	48.7
Age	18-20	221	46.6
	21-23	207	43.7
	24-26	34	7.2
	27+	12	2.5
Years of AI Experience	1-3	356	74.9
	4-6	72	15.2
	7-10	28	5.9
	>10	14	2.9
Faculty	Business	222	46.7
	ICT	123	25.9
	Health Sciences	88	18.5
	Engineering	16	3.4
	Agriculture	9	1.9
	Banking and Finance	8	1.7

3.2. Data Collection Tools

The data in this study were collected using the Artificial Intelligence Attitude Scale (AIAS-4) developed by Grassini (2023) to assess the general attitudes of university students towards artificial intelligence. This scale has four items. The AIAS-4 includes items that measure beliefs about AI's influence on personal and professional lives and overall sentiments about AI's impact on humanity. The scale employed was a 10-point Likert scale that provided a range between "Not at all" (1 point) to "Completely agree" (10 points). Cronbach's Alpha value was calculated for the reliability measure of the scale. The results yielded a score of 0.85, indicating high internal consistency of the scale. This reliability confirms that the AIAS-4 scale is a robust tool for measuring students' general attitudes towards AI.

1. Not at all	2. Hardly at all	3. Slightly	4. Somewhat disagree	5. Moderately disagree	6. Neither agree nor disagree	7. Moderately agree	8. Somewhat agree	9. Strongly agree	10. Completely agree
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*Figure 1. 10-point Likert scale for AIAS-4.
Source: the authors' own conception*

3.3. Data Analysis Methods

The collected data were analysed using the Mann-Whitney U test, the Kruskal-Wallis test, and Spearman rank correlation analysis since the normality distribution and homogeneity of variances were not met. In this study, a nonparametric Quade ANCOVA was conducted to examine whether AI attitude scores differ across age and gender after controlling for AI experience (Quade, 1967). The Quade ANCOVA is a rank-based method suitable when assumptions of normality and homogeneity of variance are violated. It combines the robustness of nonparametric methods with the analytical benefits of ANCOVA by first ranking both the dependent variable and covariate, and then analysing the unstandardised residuals from a regression of ranked dependent scores on ranked covariates. These residuals are subsequently subjected to an ANOVA-like test, with the grouping variables as factors. In this study, gender and age group were used as categorical independent variables (factors), and AI Experience was the covariate. A significance level of $p < 0.05$ was considered the threshold for statistical significance.

3.4. Procedure

This research aimed to investigate the AI attitudes among university students. The literature on measuring university students' AI attitudes was reviewed in detail. It was determined that the AIAS-4 scale developed by Grassini (2023) was suitable for the study. Ethical approval was obtained from the Near East University Scientific Research Ethics Committee, adhering to the criteria regarding ethical considerations and participant confidentiality (NEU/AS/2025/227). After the ethics committee approval was obtained, the data were collected online. After data preprocessing, suitable data analysis methods were used to analyse the collected data. Then, the results were interpreted, and the research questions were answered.

4. Results

4.1. University Students' General Attitudes

The interpretation of mean scores for the 10-point Likert scale is presented in Table 2 (Sawetmethikul et al., 2024). The analysis of student attitudes towards AI indicates a generally moderate level of acceptance based on the mean scores of the AI Attitude Scale items (Mean=6.20, SD=3.17), with most items scoring above the neutral point of 5.00. The mean score of the item 'I believe AI technology is helpful to humanity' was the lowest among the statements, at 5.79, which indicates a moderate belief in AI's societal benefits. Slightly higher, the item 'I believe AI will improve my life' had a moderate mean score of 5.98, reflecting a neutral to slightly positive attitude. The statement 'I believe AI will improve my work' scored 6.21, suggesting a moderate level of confidence in AI's role in professional life. Lastly, 'I believe I will use AI technology in the future' had the highest mean at 6.80, placing it in a higher range, which implies that while students recognise AI's potential, they remain somewhat cautious about their future engagement with it. The results indicate that generally, attitudes towards AI are positive, as depicted by mean scores ranging between 5.79 regarding the perceived positivity of AI for humanity and 6.80 on the likelihood of future use of AI. More detailed descriptive statistics are shown in Table 3.

Table 2. Interpretation of Mean Scores for 10-Point Likert Scale (Sawetmethikul et al., 2024)

Mean Range	Interpretation
8.75 – 10.00	Most
6.25 – 8.74	More(positive/moderate)
3.75 – 6.24	Moderate
1.25 – 3.74	Less
0.00 – 1.24	Least

Table 3. Item Statistics

Scale Item	Min-Max	Mean (SD)	Median (IQR)
I believe AI will improve my life.	1-10	5.98(3.29)	5.5(7)
I believe AI will improve my work.	1-10	6.21(3.31)	6.5(7)
I think I will use AI technology in the future.	1-10	6.80(3.34)	8(6)
I think AI technology is positive for humanity.	1-10	5.79(3.31)	5(6)

4.2. Demographics Information Difference

4.2.1. Gender

These findings show that the difference in attitude towards AI between male and female students, as depicted by the mean rank, was slightly higher for males, 238.37, than for females, at 236.58, as seen in Table 4. However, this difference was not significant ($p = 0.887$) as shown in Table 4. Although not statistically significant, the pattern observed aligns with prior studies that male students tend to accept technology more than their female counterparts due to more exposure to and early encouragement in technical and STEM-related activities. Although the result is not statistically significant, this finding has important implications for targeted interventions to reduce gender gaps in AI, such as developing early interest among female students in AI and increasing the presence of female role models in technology. Such initiatives may eventually narrow the confidence gap and improve the attitude of female students towards the adoption of AI.

Table 4. Gender Differences in Attitudes Towards AI (Mann-Whitney U test)

	Gender	N	Mean Rank	Sum of Ranks	U	Z	p
AI Attitude	Male	243	238.37	57924.00	27855.000	-0.142	0.887
	Female	231	236.58	54651.00			
	Total	474					

4.2.2. Age

The age-based analysis showed some variations in the attitudes towards AI, relatively more positive, by the youngest students aged 18–20 years, with a mean rank of 239.61 compared to other age groups. However, the difference was not significant ($p = .077$) as seen in Table 5. This aligns with the concept of "digital natives," whereby individuals of younger ages have become more accustomed to AI technologies through constant exposure to educational tools and everyday applications. Older students scored relatively lower AI attitude scores because of scepticism, unfamiliarity, or ethical issues about AI. This result is in accordance with the generation theories that say that younger generations are more adaptable to changes made in technology.

Table 5. Age-Related Variations in AI Attitudes (Kruskal-Wallis Test)

Scale	Age	N	Mean Rank	H	df	p
AI Attitude	18-20	221	239.61	6.836	3	0.77
	21-23	207	232.07			
	24-26	34	222.62			

	27-30	12	334.63	
	Total	474		

4.2.3. Years of Experience

The correlation analysis of the data indicated that there was no significant correlation between the years of experience with AI technologies and students' attitudes towards AI ($p=0.587$). This result suggests that different factors that may affect students' attitudes may mediate the effect of the duration of AI experience.

A Quade ANCOVA was performed using AI Attitude (residualised on AI Experience) as the dependent variable, with Gender and Age Group as between-subjects factors. The model summary is provided in Table 6.

Table 6. Tests of Between-Subjects Effects (Quade ANCOVA)

Source	Type III SS	Df	Mean Square	F	p	Partial Eta Squared
Corrected Model	35920.649	4	8980.162	9.954	0.000	0.078
Intercept	16936.797	1	16936.797	18.773	0.000	0.038
Gender	688.401	1	688.401	0.763	0.383	0.002
Age Group	31769.130	3	10589.710	11.738	0.000	0.070
Error	423118.253	469	902.171			

The Quade ANCOVA results showed a statistically significant main effect of age group on AI Attitude after controlling for AI Experience, $F(3, 469) = 11.738$, $p < 0.001$, $\eta^2 = 0.070$, indicating a medium effect size (Cohen, 1988). However, the effect of gender was not statistically significant, $F(1, 469) = 0.763$, $p = 0.383$, $\eta^2 = 0.002$. The post hoc comparisons in Table 7 and Figure 21 showed significant differences, particularly between younger and older age groups, with older individuals showing higher adjusted AI Attitude scores (between age groups 18–20 and 24–26, 18–20 and 27+, 21–23 and 24–26, 21–23 and 27+).

Table 7. Post-Hoc Comparisons

Age Group (I)	Age Group (J)	Mean Difference (I-J)	Std. Error	p	95% CI Lower	95% CI Upper
18–20	21–23	2.29	2.91	.860	-5.20	9.78
18–20	24–26	29.13*	5.53	.000	14.86	43.39
18–20	27+	32.33*	8.90	.002	9.37	55.28
21–23	24–26	26.84*	5.56	.000	12.51	41.17
21–23	27+	30.04*	8.92	.005	7.04	53.03

Kruskal-Wallis test results indicated no statistically significant differences in AI Attitude scores between age groups. However, significant differences were found between age groups when AI Experience was statistically controlled using a nonparametric Quade ANCOVA. This suggests that AI Experience was a confounding variable masking the effect of age in the original analysis. By controlling for AI Experience, we revealed the independent effect of age on AI Attitude. In conclusion, these findings emphasise that variables such as AI Experience should definitely be controlled when assessing AI attitudes. Controlling for covariates reveals hidden effects and provides a more accurate understanding of differences between groups.

Although initial Kruskal-Wallis analysis suggested that the youngest group (18–20) had slightly higher AI attitude scores, these differences were not statistically significant. However, once AI experience was controlled for in the Quade ANCOVA, older students (24–26 and 27+) exhibited significantly higher adjusted AI attitude scores. This reveals that AI experience was a confounding variable, masking the true age-related effect.

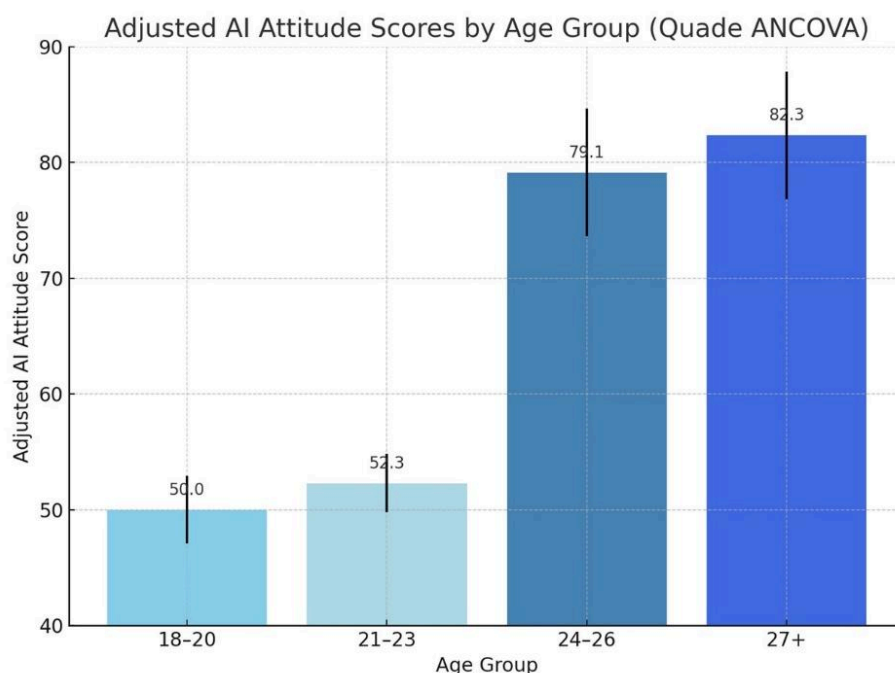


Figure 2. Adjusted AI attitude scores by age groups (Quade ANCOVA)
Source: the authors' own conception

5. Discussion

AI has the potential to revolutionise education by student learning experiences (Robert et al., 2024), encouraging greater engagement (Ifraheem et al., 2024), and creating flexible learning routes (Alashwal, 2024). Due to this feature of artificial intelligence, its popularity in education is growing rapidly. In the literature, there are studies investigating the positive (Katiyar et al., 2024) and negative (Silvennoinen et al., 2025; Köse, Şimşek, & Demir, 2025) aspects of using AI in education. However, studies examining students' attitudes towards AI are insufficient. Therefore, this study investigates the attitudes of university students towards artificial intelligence, particularly in underdeveloped countries, with a focus on Somalia.

Overall, the study results indicate that university students' attitudes towards artificial intelligence are at a moderate level but tend to be positive. Similar results were found in the study by Ahmed et al. (2024), which assessed attitudes and practices related to AI in Somalia's health education sector. In the initial bivariate analysis, no statistically significant difference was found across gender or age. However, a Quade ANCOVA controlling for AI experience revealed that age had a statistically significant effect on AI attitude, while gender was still non-significant. What is suggested is that age differences, especially those between younger and older groups, could have been muted in less sophisticated tests on account of the confounding effect of experience. These findings underscore the need to use multivariate methods when evaluating complex attitudinal phenomena.

Gender was not found to be a significant predictor of attitude, even after multivariate adjustment. This aligns with studies conducted by Köse, Şimşek, & Demir (2025) in Turkey and Sarfo et al. (2024) in Nigeria, which also concluded that these factors have a weak effect on AI attitudes. Based on these findings, it can be stated that gender and experience are not influential factors in AI attitudes. In contrast, this research deviates from previous studies that posited that

women are more apprehensive about technology compared to men (Grassini, 2023). This could be due to the actions that fostered gender equality in the fields of science, technology, engineering, and mathematics, along with greater sensitisation of women to accessing technology. In addition, it can be stated that the increasingly widespread use of artificial intelligence tools in education and daily life contributes to the development of a more balanced attitude towards technology between males and females. Cesaro et al. (2024) highlighted that educational robots designed to avoid gender stereotypes promote inclusivity, resulting in minimal gender-based differences in attitudes towards AI tools in education.

Although the Kruskal-Wallis test suggested no significant age differences, the Quade ANCOVA revealed that once AI experience was controlled for, age had a clear and significant effect. Post hoc comparisons showed that older students (24–26 and 27+) had significantly higher adjusted AI attitude scores than their younger peers (18–20 and 21–23). Although younger students are more flexible with new technologies, the finding indicates that older students have more advanced or positive views on AI when exposure is controlled for. Evidence from East Africa indicates that older individuals with greater levels of education have more favourable attitudes towards artificial intelligence, as greater academic exposure and more extensive use of digital tools make them more open to adopting AI (Fundi et al., 2024). This indicates a necessity for pedagogical differentiation with age because older students may bring reflective nuance and experiential appreciation for the effect of AI, whereas younger students may respond from a tacit level but need a higher degree of critical consciousness. Several studies support the idea that age-related differences are changing. Amjad, Aslam, & Hamedani (2024) found that educators, irrespective of their age, viewed AI as a helpful resource to apply in addressing systemic educational disparities. A Zhang et al. (2024) meta-analysis similarly found that AI-based tools, such as virtual learning assistants, were equally highly regarded by educators across age groups. These studies reflect how inclusive design in AI contributes to narrowing generational divides. The finding that older students show more positive attitudes towards AI may be influenced by several factors, including cultural expectations, prior educational experiences, and differing levels of exposure to technology. Future research should consider integrating theoretical frameworks from the digital divide literature and established models of technology acceptance, such as the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), to better interpret these patterns. These models can provide structured approaches to understand how perceived usefulness, ease of use, and social influence affect individuals' attitudes towards technology, which could offer deeper explanatory power in contexts like Somalia.

The nonsignificant correlation with actual AI experience indicates that attitudes towards AI are dependent on some other factors other than exposure. The research established that the duration of a person's experience with AI has no bearing on their general attitude towards AI, challenging the common supposition that long-term experience with AI inevitably promotes positive or negative attitudes towards it. Current research in the Global South stresses that attitude development is not merely a matter of duration. This puts into question a methodological consideration of using the variable of time as a proxy for the measurement of AI perception, and that the variables of contextual relevance, digital literacy, and institutional trust have a more determinative influence (Fundi et al., 2024; Mthombeni, 2024). As mentioned earlier, the AIAS-4 scale comprises only positively worded questions, which could be liable to produce acquiescence bias, a concern that needs to be borne in mind when evaluating the findings.

The findings of the study show that Somali university students generally hold moderately positive attitudes towards AI. However, the lack of formal AI education and limited access to relevant technologies hinder deeper engagement and understanding. To foster more informed and confident attitudes towards AI, it is recommended to integrate AI-focused curricula into higher education, improve infrastructure, and address this through targeted awareness campaigns and practical training, particularly in underserved regions of Somalia.

6. Conclusion

Artificial Intelligence (AI) is increasingly a fundamental pillar of education, transforming learning environments in personalised learning, computer-based testing, and more efficient administration. With AI increasingly established in educational institutions, it is crucial to be aware of how students perceive AI in order to ascertain their readiness to employ AI-based learning tools, their learning outcomes, and the overall effectiveness of AI in education. This study contributes to the limited body of research on student attitudes towards artificial intelligence in underrepresented contexts by focusing on Somalia. Thus, this study investigated university students' attitudes towards AI and whether demographic factors influence these attitudes in Somalia. While initial bivariate analyses did not reveal significant differences based on gender, age, or AI experience, the application of a nonparametric Quade ANCOVA test revealed a significant effect of age when AI experience was statistically controlled. These findings underscore the importance of accounting for potential confounding variables, such as prior AI experience, when examining attitudinal differences. Notably, older students demonstrated more positive attitudes towards AI compared to their younger counterparts once experience was held constant. Gender, on the other hand, did not appear to influence attitudes in either bivariate or multivariate models. The findings of this study provide valuable guidance to educators, policymakers, and AI developers in a useful way. These results suggest that age-related differences may be masked unless key covariates are appropriately adjusted for. AI-related educational strategies and institutional policies should be age-sensitive and tailored to the specific needs and experiences of different student groups.

There are some limitations in the study, as with all scientific studies.

Limitations related to sample selection and demographic diversity:

First, the use of a convenience sampling method significantly restricts the generalisability of the findings to the broader student population. Furthermore, the study was based on universities in Somalia; hence, it is not easy to generalise to other institutions in other nations. The work would be more representative if it were done in more institutions in different countries.

Limitations related to participants' self-reporting:

Another limitation of this study is the exclusive use of positively worded items in the Grassini scale, which may have introduced acquiescence bias and potentially affected the validity of the attitude measurements. This may not fully reflect the participants' true attitudes towards AI. This limitation stems from the structural characteristics of the scale, and it is recommended that scales supported by items that include a balance of positive, negative, and neutral statements be used in future studies. In addition, developing more comprehensive attitude scales that include items to measure doubt, hesitation, or negative evaluations towards AI or revising existing scales to include these dimensions can provide more balanced and reliable measurements.

Limitations related to the measurement instrument:

The current scale's lack of negatively or neutrally worded items and limited scope in capturing complex attitudes is a notable limitation. Future studies should adopt or develop more validated instruments that better capture a full range of attitudes toward AI.

Other limitations and future directions:

Lastly, the study predominantly examined demographic variables, yet future studies ought to also determine psychological and social variables, such as motivation, exposure to technologies in the past, and social influences, to gain a better understanding of AI attitudes.

Based on these limitations, subsequent studies should employ a mixed-methods design that combines qualitative and quantitative methods to obtain a more integrated view of AI perception among students. Given the specificity of the cultural context, future research using qualitative data collection methods (e.g., open-ended questions or interviews) in addition to Likert-type scales would contribute to a more nuanced analysis of attitudes towards AI. On the other hand, the study was conducted using a convenience sampling method, which limits the generalisability of the findings. It is recommended that stratified or random sampling methods be preferred across different regions or institutions in future studies. Educational institutions should also implement AI training programs that not only provide students with AI knowledge but also provide them with a high

comfort level in using it effectively. By closing these gaps, institutional policies and future research can promote more equitable AI adoption in higher education to yield more efficient and equitable learning environments. In this context, more multifaceted variables might influence attitudes towards AI than those examined here. Further analysis probing education-related, social, or technology-specific factors would help inform contextually appropriate AI integration strategies among teachers and policymakers in Somalia and settings similar to it.

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