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Article

Artificial Intelligence Literacy and Trust in AI Systems among University Students in Egypt

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Abstract: This research aimed to explore the correlation between AI literacy and trust in AI systems among university students in Egypt. The study focused on the increasing sociological significance of AI literacy as a competence influencing students' understanding, assessment and dependence on intelligent technologies in higher education. The quantitative cross sectional survey design was used and the respondents were 384 undergraduate students from public and private universities in Egypt. The questionnaire assessed the level of AI literacy and trust in AI systems on a 5-point Likert scale. Data were analysed by descriptive statistics, Cronbach's alpha, exploratory factor analysis, Pearson correlation and linear regression in SPSS. The results indicated that students' AI literacy was high and their trust in AI systems was moderate. The Pearson correlation showed that there was a statistically significant positive correlation between AI literacy and trust in AI systems. The regression analysis also revealed that AI literacy significantly explained the variance in trust in AI systems, accounting for 29.4% of the variance. By demonstrating the social significance of AI literacy beyond its technical aspects, the study adds to the sociology of AI, highlighting how this competency influences students' confidence in AI-enhanced learning spaces. The results underscore the importance of creating structured AI literacy initiatives within universities to foster trust in AI systems that is informed, critical, and ethical.

Keywords: *Artificial intelligence literacy, Trust in AI systems, University students, Egypt, Digital society, Higher education.*

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Introduction

Artificial intelligence (AI) is a key component of today's digital society, transforming education, communication, public services, the labour market and daily life. AI is not just a technical device, but is also becoming part of social institutions and practices, which has led to sociological concerns about knowledge, trust, risk, inequality, and human agency (Floridi & Cowls, 2019; Jobin et al., 2019; Crawford, 2021). In the context of higher education, these concerns have grown more prominent as students are increasingly exposed to AI-powered learning platforms, automated assessment systems, generative AI applications, recommender systems, and digital academic services (Selwyn, 2019; Holmes et al., 2019; Kasneci et al., 2023). Universities are thus not only places of study of AI, but also places of use, interpretation, trust, questioning, and normalisation of AI.

AI literacy has thus become a key competency for university students. AI literacy refers to individuals' ability to understand, use, evaluate, and critically reflect on AI systems and their social, ethical, and practical implications (Long & Magerko, 2020; Ng et al., 2021). The concept is not just about technical programming knowledge, but also about understanding algorithmic decision-making, data use, bias, transparency, reliability, and responsible interactions with intelligent technologies (Kong et al., 2021; Druga et al., 2019). AI literacy can be seen as a type of digital cultural capital that influences students' capacity to engage successfully in AI-supported learning and social contexts (Bourdieu, 1986; Helsper, 2021). Previous regional research on digital access, digitalisation and student technology use has demonstrated that technological engagement is not just a personal choice, but is influenced by broader social, educational and institutional contexts (Alhrahsheh & Ivanova, 2022; Alhrahsheh, 2023; Alhrahsheh & Almajali, 2023).

The trust in AI systems is also crucial, as AI technologies can be opaque, uncertain, and not fully understood by users. Trust has been seen as a way for social actors to deal with complexity and risk (Luhmann, 1979; Giddens, 1990; Sztompka, 1999). Technological contexts involve the perception of reliability, competence, transparency, predictability and accountability (Lee & See, 2004; Hoff & Bashir, 2015). The concerns are more complicated in the context of AI, as algorithmic systems often generate results that are not easily verifiable or fully explainable by the user (Burrell, 2016; Pasquale, 2015). Therefore, trust in AI should not be seen as blind trust, but as calibrated trust, which is informed

by a judgment of the capacities, limits and risks of AI systems (Glikson & Woolley, 2020; Jacovi et al., 2021).

AI literacy and trust in AI systems continue to be a sociologically relevant and under-researched phenomenon in the context of Arab higher education. Greater AI literacy can foster trust by minimizing uncertainty and enhancing students' understanding of AI systems. But literacy can also foster more critical forms of trust, as students become more aware of algorithmic bias, misinformation, privacy concerns, and ethical issues (O'Neil, 2016; Eubanks, 2018; Mittelstadt et al., 2016). Recent research in the Gulf region has also revealed that digital and AI-related technologies have an impact on social behaviour, environmental awareness, sustainability practices, employability, and access to essential services, indicating that digital competence is becoming a sociological factor that affects social participation and institutional confidence (Alhrahsheh et al., 2026; Ivanova et al., 2026; Ivanova & Alhrahsheh, 2026).

The question is especially pertinent in Egypt, where national policies are increasingly focusing on digital transformation, AI capacity development, and the training of the youth for an AI economy. The students in the universities of Egypt are a socially relevant group since they are expected to interact with AI systems in education, work, public services and daily life. However, literacy does not always result from exposure to AI, and using AI regularly does not automatically result in informed trust. While there is a growing body of international research on the role of AI in education, research specifically on the relationship between AI literacy and trust in AI systems among Egyptian university students is still limited. This study thus investigates the relationship between AI literacy and trust in AI systems among university students in Egypt, adding to the sociology of AI, digital education, and trust in new technologies in an Arab higher education setting.

Problem Statement

AI systems are rapidly growing in higher education, offering new opportunities for learning, communication, academic support, and access to information. But it has also raised doubts about students' comprehension and critical assessment of AI technologies. Many students at universities are using AI-powered tools in their studies and daily routines, but their understanding of AI can range significantly. This variation is significant because students who are not adequately knowledgeable about AI might either over-rely on AI systems without understanding their limitations or distrust them due to uncertainty, fear, or lack of understanding.

The sociological issue is that the trust in AI systems is often framed as a technological acceptance problem, and less focus is placed on the social and educational factors that influence trust. In the context of higher education in Egypt, there is a lack of empirical evidence to support the significance of the relationship between AI literacy and students' trust in AI systems. This gap is significant as it affects students' interactions with AI tools, their assessment of AI-generated content, and their engagement in digital learning spaces. If this relationship is not understood, universities and policy makers can find it difficult to create effective AI literacy programmes that encourage critical, responsible and socially aware interactions with AI.

Research Objectives

1. To examine the level of artificial intelligence literacy among university students in Egypt.
2. To analyse the level of trust in AI systems among university students in Egypt.
3. To investigate the relationship between artificial intelligence literacy and trust in AI systems among university students in Egypt.
4. To determine whether artificial intelligence literacy significantly predicts trust in AI systems among university students in Egypt.

Research Questions

1. What is the level of artificial intelligence literacy among university students in Egypt?
2. What is the level of trust in AI systems among university students in Egypt?
3. Is there a statistically significant relationship between artificial intelligence literacy and trust in AI systems among university students in Egypt?
4. To what extent does artificial intelligence literacy predict trust in AI systems among university students in Egypt?

Research Hypotheses

H1: There is a statistically significant positive relationship between artificial intelligence literacy and trust in AI systems among university students in Egypt.

H2: Artificial intelligence literacy significantly predicts trust in AI systems among university students in Egypt.

Literature Review

Artificial Intelligence in Higher Education

In higher education, AI has been integrated into various applications, such as learning analytics, automated feedback systems, intelligent tutoring systems, plagiarism detection tools, recommender systems, and generative AI applications. These technologies have impacted the way students look for information, create academic work, interact with learning platforms, and assess knowledge. AI has the potential to improve personalised learning, academic support, and administrative processes, but it can also exacerbate issues of academic integrity, algorithmic bias, misinformation, surveillance, and digital competence disparities (Holmes et al., 2019; Selwyn, 2019; Williamson, 2017). These concerns are becoming more apparent thanks to the advent of generative AI, which enables students to write, summarise, translate, code, and solve problems using AI systems (Kasneci et al., 2023; Rudolph et al., 2023; Tlili et al., 2023).

But the learning potential of AI is not just about the technology, it's about students' understanding and evaluation of it. Previous studies of digital technology and students have demonstrated that digital engagement can have enabling and problematic effects. For instance, Alhrahsheh and Almajali (2023) identified a negative strong correlation between social networking addiction and academic performance of university students, indicating that the use of technology is meaningful for education only when it is critically managed. Likewise, Alhrahsheh and Ivanova (2022) showed that digital access is a social determinant that impacts access to services and social opportunities. The results are applicable to the field of AI as they show that technological exposure is not enough, students need to be literate, have judgement and be guided by institutions to use digital systems productively.

Artificial Intelligence Literacy

AI literacy is defined as the ability to comprehend, leverage, and critically engage with AI systems and their social impacts (Long & Magerko, 2020). It involves identifying AI applications, understanding fundamental algorithmic processes, assessing AI-generated outputs, identifying risks (including bias and privacy issues), and using AI tools ethically (Ng et al., 2021; Kong et al., 2021). AI literacy is not

only broader than technical AI skills, but also more sociological, as it relates to how regular users interact with intelligent systems in their daily lives.

According to the literature, AI literacy is emerging as a key part of digital citizenship. Higher AI literacy may enable students to better identify trustworthy content generated by AI, understand the boundaries of automation and the ethical issues associated with data, transparency and fairness (Long & Magerko, 2020; Druga et al., 2019). Literacy in AI can also be considered as a type of digital cultural capital, which provides students with varying abilities to engage with AI in learning and working environments (Bourdieu, 1986; Helsper, 2021). This aligns with the regional findings that digitalisation has an impact on access to health, welfare, income opportunities and public services (Alhrahsheh, 2023). Thus, AI literacy should not be considered as a technical variable but as a socially distributed competence that is formed through education, institutional support and digital inequality.

Trust in AI systems is a crucial component of AI adoption. Trust in AI systems is a key factor in the adoption of AI.

Trust in Artificial Intelligence Systems

The concept of trust plays an essential role in the theory of sociology because it allows people to act in an uncertain and complex world (Luhmann, 1979; Giddens, 1990; Sztompka, 1999). When it comes to AI, trust is particularly important as users are frequently relying on systems that are hard to observe or explain. Perceived reliability, transparency, accuracy, predictability, accountability, fairness and institutional legitimacy (Lee & See, 2004; Hoff & Bashir, 2015; Glikson & Woolley, 2020) are common factors that influence trust in AI systems.

However, the literature cautions against the notion of blind trust. AI systems can produce biased, incorrect, or unverifiable results, and the algorithms used to make decisions can be opaque to the general user (Burrell, 2016; Pasquale, 2015; O'Neil, 2016). Hence, calibrated trust is increasingly being stressed, which is a level of trust commensurate with the actual competence and limitations of the system (Lee & See, 2004; Jacovi et al., 2021). Calibrated trust is especially crucial in higher education, where students might use AI-generated content in their academic writing, research, decision-making, and learning activities. Too much trust can lead to reliance and false information, while too much distrust can hinder students' ability to utilize helpful learning tools powered by AI.

AI Literacy and Trust in AI Systems

This is because the connection between AI literacy and trust in AI systems is multifaceted. Increased AI literacy could lead to higher trust as students who have a better understanding of AI systems may feel more in control and have less uncertainty. On the other hand, greater AI literacy might result in higher trust as students who understand AI systems are likely to feel more in control and have less uncertainty. This argument aligns with technology acceptance research that indicates that attitudes towards technology may be influenced by perceived usefulness, ease of use and understanding (Davis, 1989; Venkatesh et al., 2003). AI literacy can also lead to more warier forms of trust, however, as those who are more aware of the limitations of algorithms, misinformation, surveillance, and ethical hazards may be more cautious about their trust in AI (Mittelstadt et al., 2016; Eubanks, 2018; Crawford, 2021). This tension implies that while AI literacy may not guarantee complete trust. Rather, it could be a critical or informed trust. This is a socially desirable form of trust as it enables students to use AI to their advantage without being oblivious of its social and technical constraints. The same applies to regional studies on AI and sustainability, which indicate that awareness of AI can impact social behaviour when people are aware of the practical implications and constraints of intelligent technologies (Ivanova et al., 2026; Alhrahsheh et al., 2026). In the context of the Arab world, however, most of the current studies are related to digital transformation, sustainability, academic performance, or technology usage in general, and there is little empirical research that directly links AI literacy and trust in AI systems among university students in Egypt. To fill this gap, this study aims to investigate the predictive power of AI literacy on trust in AI systems in the context of higher education in Egypt.

Theoretical Framework

This study is theoretically based on the Technology Acceptance Model (TAM) and the sociological theory of trust. According to the Technology Acceptance Model, people's attitudes toward and intentions to use a technology are conditioned by perceived usefulness and perceived ease of use of the technology, which in turn affect the technology's acceptance (Davis, 1989). While TAM was originally designed to account for technology adoption, it is still applicable to the understanding of trust in AI related products as students are more likely to trust AI systems when they feel they are useful, understandable, and relevant to their academic goals. Subsequent extensions of the technology acceptance model also highlight the influence of social influence, facilitating conditions, and user experience on technology use (Venkatesh et al., 2003). The present study conceptualizes AI literacy as a basic skill that can enhance students' sense of agency, alleviate uncertainty, and influence their trust

in AI systems. But there is more to trust in AI than technology acceptance. There is a more general interpretive framework, known as the theory of sociological trust. Luhmann (1979) defines trust as a process of decreasing social complexity, and Giddens (1990) connects trust to the expert systems in modern societies. AI systems can be seen as modern "expert systems" as the user is often relying on the output without knowing the inner workings of the system. This creates a social aspect of trust in AI, especially when students use it to learn, make academic decisions, and evaluate information. This trust is not blind trust, but a socially situated evaluation based on knowledge, institutional context, perceived reliability and risk awareness.

This study is able to explore AI literacy as a technological and sociological competence by combining the TAM and trust theory. The AI-literate students might be better equipped to assess the results of AI, recognize its weaknesses, and build trust and confidence in AI systems. This theoretical position aligns with the findings of the previous research conducted in the region that digital access, digitalisation and awareness of technology affect students' social participation, academic results and access to services (Alhrahsheh & Ivanova, 2022; Alhrahsheh, 2023; Alhrahsheh & Almajali, 2023). It also draws from recent research that has established a connection between AI awareness and behavioural and social outcomes in the context of the Gulf region (Ivanova et al., 2026; Alhrahsheh et al., 2026). While the field of AI in education, AI literacy and trust in automated systems has grown in the international literature, there is limited empirical research in Arab higher education. Specifically, there is a lack of quantitative evidence of the predictive relationship between AI literacy and trust in AI systems among university students in Egypt. While previous studies have focused on technology acceptance, digital learning or attitudes towards AI in general, there has been limited research on the social construct of trust as a result of AI literacy. This study aims to overcome this limitation by examining the relationship between artificial intelligence (AI) literacy and trust in AI systems in the context of an Egyptian university.

Methodology

Research Design

The current study used a quantitative cross-sectional survey design to explore the correlation between AI literacy and trust in AI systems among university students in Egypt. This design was suitable because the study was statistical, tested hypotheses and determined the direction and strength of the relationship

between the independent variable and the dependent variable. The cross-sectional design allowed for data to be gathered from a specific population of university students at one time.

Population and Sample

The study included undergraduate students from public and private universities in Egypt. The selection of undergraduate students was motivated by the fact that they are a socially significant group who have access to AI-supported learning tools, digital platforms, generative AI applications, and online academic services. The study sample comprised 384 students from various academic years and academic disciplines, which helped to capture the variation in students' exposure to and experience with AI technologies. The students were recruited using a non-probability sampling technique (convenience sampling). The online questionnaire was sent out via university communication, student organisations and academic social media groups, to students across various academic disciplines, academic year and demographic. This sampling method did not allow for the findings to be generalised, but was suitable for quantitative survey research with a large and diverse student population at a university.

Table 1

Demographic Characteristics of the Study Sample

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	182	47.4
	Female	202	52.6
Age (years)	18–20	118	30.7
	21–23	176	45.8
	24 years and above	90	23.5
Academic Year	First	79	20.6
	Second	96	25.0
	Third	108	28.1
	Fourth or above	101	26.3
Field of Study	Humanities and Social Sciences	132	34.4
	Business and Economics	88	22.9
	Engineering and Information Technology	97	25.3
	Medical and Health Sciences	67	17.4
University Type	Public	248	64.6
	Private	136	35.4
Frequency of AI Use	Daily	149	38.8
	Several times a week	128	33.3
	Once a week	62	16.1
	Rarely	45	11.7

Research Instrument

The data was collected by a structured questionnaire with four parts. The first section gathered demographic data such as gender, age, academic year, field of study, type of university, frequency of use of AI and previous experience with AI tools. The second section assessed AI literacy through items adapted from existing AI literacy scales, which included the understanding of AI concepts, identification of AI applications, assessment of AI outputs and awareness of ethical issues. The third section evaluated trust in AI systems by using questions that gauge reliability, transparency, accuracy, usefulness, accountability, and reliance on AI-generated outputs. The fourth section contained general questions about students' academic and everyday use of AI tools.

Each of the key constructs was assessed on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. Scores were higher for higher levels of AI literacy and trust in AI systems.

Validity and Reliability

The questionnaire was face and content validated by experts in Sociology, Educational Technology and Quantitative Research. The item clarity, wording and time to complete were explored in a pilot study with 30 university students. Cronbach's alpha coefficient was used to check the internal consistency of the instrument, which showed values of .70 and above. Exploratory factor analysis was used to explore construct validity.

Cronbach's alpha was used to assess the internal consistency of the study instrument. The Artificial Intelligence Literacy scale had a reliability coefficient of .86, and the coefficient for the Trust in AI Systems scale was .88 (see Table 2). The total instrument had a reliability coefficient of .91. These values were higher than the accepted value of .70, which meant that the questionnaire had high internal consistency and could be analysed statistically.

Table 2

Reliability Coefficients of the Study Instrument

No.	Scale	Number of Items	Cronbach's Alpha
1	Artificial Intelligence Literacy	12	.86
2	Trust in AI Systems	10	.88
3	Total Scale	22	.91

Exploratory Factor Analysis (EFA) was used to test the construct validity. The appropriateness of the data for factor analysis was checked by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity before the factor extraction. The KMO value was above the

recommended value of .60 and Bartlett's Test was statistically significant ($p < .001$), meaning that the data were suitable for factor analysis (Hair et al., 2022).

Table 3
KMO and Bartlett's Test of Construct Validity

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure	.892
Bartlett's Test of Sphericity (Approx. Chi-Square)	2145.37
df	231
Sig.	< .001

Table 4
Factor Loadings of the Measurement Items

Construct	Item	Factor Loading
Artificial Intelligence Literacy	AIL1	.781
	AIL2	.824
	AIL3	.765
	AIL4	.801
	AIL5	.843
	AIL6	.789
	AIL7	.816
	AIL8	.772
	AIL9	.835
	AIL10	.798
	AIL11	.812
	AIL12	.779
Trust in AI Systems	TAI1	.804
	TAI2	.841
	TAI3	.792
	TAI4	.817
	TAI5	.769
	TAI6	.826
	TAI7	.781
	TAI8	.845
	TAI9	.793
	TAI10	.809

Note. All factor loadings exceeded the recommended threshold of 0.60, indicating satisfactory construct validity.

Exploratory factor analysis gave satisfactory factor loadings for all measurement items. As can be seen in Table 4, the factor loadings ranged from .765 to .845 and all items loaded strongly onto their

constructs. All loadings were above the recommended value of .60 (Hair et al., 2022) and the results indicated satisfactory construct validity and justified the use of all items in the questionnaire for further statistical analysis.

Data Collection Procedures

The data were gathered by using an online questionnaire which was sent to the university students in Egypt. Participants were given a short explanation of the purpose of the study, voluntary participation, the confidentiality and anonymity of the study, and the estimated time to complete the study. Full responses were only included in the final analysis. Data collection took about 4-6 weeks.

The study was conducted ethically based on the principles of social science research. The participation was voluntary, informed consent was obtained and respondents were assured that their answers would remain confidential and anonymous. Personally identifying information was not gathered. The participants could withdraw from the questionnaire before they submitted it.

Statistical Analysis

The data were analysed in SPSS. The sample description and the main variables were described using descriptive statistics such as frequencies, percentages, means and standard deviations. Cronbach's alpha was used to assess reliability. The Pearson correlation was used to explore the correlation between AI literacy and trust in AI systems. Simple linear regression was then performed to see if there was a significant relationship between artificial intelligence literacy and trust in AI systems. Multiple regression analysis was also done to account for gender, age, academic year, field of study, frequency of AI use and prior AI experience.

Results

Descriptive Statistics

The descriptive statistics were calculated to explore the levels of AI literacy and trust in AI systems among university students in Egypt. In particular, the mean scores and standard deviations were determined to describe the general level of perception of the respondents about the study variables and to determine the level of variation of the respondents' responses. The mean scores were higher the more AI-literate or trustful students were, while the standard deviations showed the range of students' perceptions. The findings give an initial overview of the sample and will be used to look at the relationship between AI literacy and trust in AI systems. The descriptive results are shown in Table 5.

Table 3
Descriptive Statistics of the Main Study Variables

Variable	N	Mean	Std. Deviation	Level
Artificial Intelligence Literacy	384	3.71	0.68	High
Trust in AI Systems	384	3.58	0.72	Moderate to high

Table 5 shows that the respondents reported a high level of artificial intelligence literacy (M = 3.71, SD = 0.68). Trust in AI systems recorded a moderate level (M = 3.58, SD = 0.72), suggesting that although university students generally expressed positive perceptions towards AI systems, their trust remained cautious more than unconditional.

Correlation Analysis

Pearson's correlation was used to explore the correlation between AI literacy and trust in AI systems. The results are shown in Table 6.

Pearson's correlation analysis was conducted to examine the relationship between artificial intelligence literacy and trust in AI systems. The findings are presented in **Table 6**.

Table 6
Pearson Correlation Matrix

Variables	1	2
1. Artificial Intelligence Literacy	1	
2. Trust in AI Systems	.542**	1

Note. $p < .001$.

The results indicate that there is a statistically significant positive correlation between AI literacy and trust in AI systems ($r = .542$, $p < .001$) as presented in Table 6. The correlation coefficient shows a moderate positive association between AI literacy and trust in AI systems, suggesting that as students' AI literacy increased, so did their trust in AI systems. Thus, the first hypothesis was confirmed.

Regression Analysis

A simple linear regression analysis was conducted to examine whether artificial intelligence literacy significantly predicted students' trust in AI systems. This analysis was used to determine the direction and strength of the relationship between the two variables and to assess whether higher levels of AI literacy were associated with higher levels of trust in AI systems. Artificial intelligence literacy was entered as the independent variable, while trust in AI systems was treated as the dependent variable. The regression results, including the regression coefficient, explanatory power, and statistical significance of the model, are presented in Table 7.

Table 7

Simple Linear Regression Predicting Trust in AI Systems

Predictor	B	SE	β	t	p
Constant	1.463	.191	—	7.66	< .001
Artificial Intelligence Literacy	.571	.046	.542	12.49	< .001

The regression analysis showed that the artificial intelligence literacy significantly predicted the trust in AI systems ($\beta = .542$, $t = 12.49$, $p < .001$). Artificial intelligence literacy accounted for 29.4% of the variance in trust in AI systems ($R^2 = .294$), suggesting that AI literacy was a significant predictor of students' trust in AI systems. Thus, the second hypothesis was confirmed.

Discussion

The study aimed to investigate the relationship between AI literacy and trust in AI systems among university students in Egypt. The results indicated that students were highly knowledgeable about AI and moderately trustful of AI systems. The trend indicates that students were not passive consumers of AI technologies but rather seemed to have a degree of understanding of AI tools and were cautious about their reliability and social impact.

The relatively high level of AI literacy aligns with recent literature that indicates that university students are increasingly interacting with AI via generative AI tools, intelligent search systems, learning platforms and digital academic services (Long & Magerko, 2020; Ng et al., 2021; Kasneci et al., 2023). It also supports the regional evidence of the integration of digital technologies into students' academic and social lives (Alhrahsheh & Ivanova, 2022; Alhrahsheh & Almajali, 2023). But the discovery cannot be taken as proof of the advanced technical skills of AI. Instead, it indicates the ability to be functional and useful in the use of AI after repeated use of digital tools, which is what AI literacy entails. Instead, it is a sign of functional and useful AI literacy that has been gained through repeated interaction with digital tools. In the Egyptian context, this literacy can be influenced more by the use of AI in everyday life than by formal education in AI, which is why students might know how to use AI tools without having a strong grasp of the algorithms themselves.

This is especially significant in the context of the moderate level of trust in AI systems. It suggests that students were not overly reliant on AI technologies. This result is consistent with the work of Glikson and Woolley (2020), which suggests that trust in AI is influenced by the perceived reliability, transparency, and performance of the system. It also aligns with the concept of calibrated trust proposed by Lee and See (2004) that users will trust technology according to their knowledge and understanding of its capabilities and limitations. Concurrently, the discovery is in contrast to overly positive accounts

of technology acceptance that equate with higher frequency of use, higher levels of trust. Students' trust in AI was found to be guarded, perhaps due to concerns about misinformation, skewed results, privacy issues, and questions about academic honesty (O'Neil, 2016; Eubanks, 2018; Crawford, 2021).

The positive relationship between AI literacy and trust in AI systems reinforces the idea that knowledge helps to alleviate uncertainty. Higher AI literacy was associated with increased trust in AI systems as students could better understand what they do, assess their results, and identify their weaknesses. This is in line with the research on trust in automation, which indicates that users' knowledge of system behavior is a factor in appropriate reliance (Lee & See, 2004; Hoff & Bashir, 2015). It also facilitates AI literacy studies that propose that knowledge of AI enhances users' ability to critically and responsibly interact with intelligent systems (Long & Magerko, 2020; Kong et al., 2021).

However, this is a finding that needs to be taken with a grain of salt. Some critical research indicates that as users gain more knowledge about technology, they may become more skeptical, as they become more aware of issues such as surveillance, bias, opacity, and algorithmic harm (Pasquale, 2015; O'Neil, 2016; Eubanks, 2018). This literature is not necessarily at odds with the present study. Instead, it proposes that AI literacy can result in informed trust, not naive acceptance or outright rejection. That is, students who have high AI literacy are more likely to trust AI systems due to their ability to determine when AI is helpful and when it is dangerous.

The regression results also indicated that AI literacy was a significant predictor of trust in AI systems, accounting for about 29% of the variance. This is a significant finding as it indicates that AI literacy is not just associated with trust, but also serves as an explanatory variable. The unexplained variance, however, suggests that other factors such as perceived risk, institutional trust, digital inequality, past experience with AI tools, academic discipline, and trust in regulatory systems also influence trust in AI. AI literacy is a prerequisite, but not a sufficient one, to foster trust in AI systems.

The results of the study theoretically support the Technology Acceptance Model. Higher AI literacy was associated with higher understandability, usefulness and manageability of AI systems, which led to higher trust (Davis, 1989; Venkatesh et al., 2003). The results also corroborate the sociological trust theory. Here, Luhmann's (1979) definition of trust as a way of reducing complexity comes in handy, as AI systems are complex technologies, which students can't observe and explain in full. AI literacy helps to demystify some of this complexity and provides students with greater confidence when interacting

with AI systems. Likewise, Giddens' (1990) notion of expert systems can help to explain why students might be accepting AI when they think they have sufficient knowledge to assess it.

The study also reveals that from a sociological point of view, the ability to use AI should not be seen as a technical competency. It is a type of digital social capital that influences students' engagement in AI-enriched learning contexts. The more students are literate in AI, the more they can assess the information in algorithms, manage uncertainty, and engage with confidence in digitally transformed institutions. This builds on existing regional studies of digital access, digitalisation and technology use by revealing how AI literacy influences trust in new technologies in Arab HE settings.

Limitations

There were a number of limitations to this study. First, the cross-sectional design did not allow for causal inferences between AI literacy and trust in AI systems. Secondly, response bias may have occurred with the use of self-reported data. Third, the study was conducted among university students in Egypt, therefore, the results are not generalisable to other Arab countries or other groups of people who do not attend university. Lastly, the study investigated the role of AI literacy as a primary determinant of trust, with other factors like perceived risk, AI self-efficacy, institutional trust, and regulatory confidence potentially impacting trust in AI systems.

Future Research Directions

Longitudinal studies are needed to explore the evolution of AI literacy and trust. Cross-country comparisons of trust in AI across Arab countries would also be useful to uncover cultural and institutional variations in trust. Other studies might examine mediating variables (e.g., perceived risk, AI self-efficacy, digital inequality, technology readiness, institutional trust) and moderating variables (e.g., age, gender, ethnicity, education, experience, and location). Further, mixed-methods research would be useful for comprehending students' explanations of their trust, caution, or resistance in their own words.

Conclusion

This study aimed to investigate the association between Artificial Intelligence (AI) literacy and trust in AI systems among university students in Egypt. The results indicated that students' AI literacy was high, and their trust in AI systems was moderate. The results also revealed a statistically significant positive correlation between AI literacy and trust, and that AI literacy was a significant predictor of students' trust in AI systems.

The research makes a significant contribution to the sociology of AI by demonstrating that AI literacy is not just a technical skill, but a socially relevant resource that influences students' understanding, assessment, and trust of intelligent technologies. The results highlight the need for a multifaceted approach beyond mere access to digital tools to foster trust in AI in the Egyptian higher education sector, which includes the development of structured AI literacy programmes that encourage critical, ethical, and informed interactions with AI systems.

In conclusion, the research underscores the need to educate university students to engage in AI-enabled learning and social settings in a responsible manner. Improving AI literacy can empower students to trust AI appropriately, using it to their advantage without being unaware of its potential pitfalls, dangers, and ethical considerations.

Declarations

AI Acknowledgement

The author used ChatGPT for language editing and clarity enhancement only. The author retained full responsibility for all study design, analysis, interpretation, and final content.

Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this paper.

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