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The Mediating Effect of AI Application in the Relationship between AI Awareness and AI Trust

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Abstract

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In education, AI awareness is crucial in building trust and effective application of AI technologies among users. By understanding AI's capabilities and limitations, learners can develop a more informed trust in AI systems, enhancing their ability to apply AI effectively in practical scenarios. This study investigates how AI applications influence the relationship between AI awareness and trust among university students in the Philippines' Regions XI and XII. The study used a quantitative, non-experimental correlational method, with 1161 university L2 learners chosen by stratified random selection. Data was gathered by online surveys with questions scored on a 5-point Likert scale, as revealed by Ng et al. (2022) and Wang et al. (2023). SmartPLS version 4.0 was used for bootstrapping mediation analysis, while Jamovi 2.0 was used for statistical analysis of descriptive data. The findings revealed significant relationships between AI awareness and AI application (coefficients ranging from 0.831 to 0.875) and AI application and AI trust (coefficient = 0.329). The mediation study revealed a substantial indirect influence of AI awareness on AI trust through AI application (coefficient = 0.167), emphasizing the potential of experiential learning-based training strategies to improve AI competency and trust. These findings give useful insights for building AI educational programs that increase student acceptance and trust in AI technology.

Keywords

Artificial Intelligence, AI application, AI awareness, AI trust, Mediation Effects

Introduction

The rapid advancement of artificial intelligence (AI) technologies has significantly transformed various aspects of human life, including communication, healthcare, and customer service. For instance, integrating AI into everyday life, such as personal assistants and social media algorithms, has significant psychological and behavioral impacts (Bharathi et al., 2023). Furthermore, trust in AI is influenced by a combination of human-related, AI-related, and context-related factors (Jermutus et al., 2022; Kaplan et al., 2021; Sethumadhavan, 2018).

AI awareness refers to how individuals are informed about AI technologies, their capabilities, and their limitations. This awareness can shape perceptions and attitudes towards AI, potentially influencing users' trust in these technologies. Trust in AI, on the other hand, significantly impacts the intention to use AI technologies, mediated by perceived usefulness and user attitudes (Choung et al., 2022; Bedué & Fritzsche, 2021; Dorton & Harper, 2022).

Previous research has highlighted the importance of trust in AI across different domains. For instance, in healthcare, trust in AI applications is influenced by factors such as data privacy, transparency, and the perceived benevolence of the AI system (Jermutus et al., 2022). Similarly, in customer service, trust is mediated by the perceived convenience, personalization, and service quality provided by AI-enabled services (Ameen et al., 2020). Moreover, the humanness of AI applications, including aspects like anthropomorphism and intelligence, plays a significant role in shaping consumer trust (Troshani et al., 2020).

According to Hohenstein and Jung (2020), the relationship between AI awareness and AI trust is complex and may be mediated by the specific applications of AI. For example, AI-mediated communication can enhance perceived trust between human communicators by providing smart replies, which can improve conversational outcomes

and reduce misattribution. Additionally, attachment styles and affective factors have been shown to influence trust in AI, suggesting that emotional and psychological factors also play a role in this relationship (Gillath et al., 2020). Moreover, Obenza et al. (2024) discovered that college students had moderate degrees of AI trust and attitude toward AI, as well as a high level of AI self-efficacy. Subsequently, the mediation analysis indicates that AI trust has a significant mediating influence on the connection between AI self-efficacy and college students' attitudes toward AI.

Additionally, Asio and Suero (2024) posited that users believed themselves to be very proficient in using AI efficiently, and they had a moderate amount of trust in their capacity to communicate with AI systems. The usage of AI systems exhibited consideration, understanding, and confidence when interacting with artificial intelligence systems. Concepcion et al. (2019) emphasized the necessity of growing AI literacy among the public, guaranteeing that people understand AI technologies, their advantages, and risks. According to Asirit and Hua (2023), to successfully navigate the opportunities and complexity of the AI-driven environment, students must acquire AI literacy, which combines knowledge with real-world application. This calls for both technical instruction and a thorough understanding of the ethical and social ramifications of AI. By comprehending these impacts and adjusting instruction, educational institutions can get students ready for a future in which artificial intelligence will play a bigger role.

This study aims to address this gap by exploring the mediating effects of AI applications on the relationship between AI awareness and AI trust among university learners. By examining how AI application influences the dynamics between awareness and trust, the research seeks to provide insights into how educational interventions and technological designs can enhance user

experience and acceptance of AI. Understanding these relationships is crucial for developing effective strategies to foster a more informed and trusting engagement with AI technologies.

This study seeks to contribute to the existing literature by investigating the mediating role of

AI applications in the relationship between AI awareness and AI trust. By doing so, it aims to provide insights that can inform the design and implementation of AI systems that are trustworthy and widely accepted by users.

Materials and Methods

Research Design

This study employed a quantitative research approach, specifically a non-experimental correlational technique, to evaluate the relationship between AI awareness, trust, and application among university L2 learners in Regions XI and XII, Philippines. This technique allows us to look at the mediating impacts of AI applications on the relationship between AI awareness and AI trust. As defined by Creswell & Creswell (2023), quantitative research involves systematically collecting, analyzing, and interpreting numerical data, often through

surveys or experimental means, to test hypotheses objectively. Mediation analysis was applied to examine how AI application influences the connection between awareness and trust. On the other hand, by including a mediating variable in the study, mediation analysis looks at how it affects the relationship between two other variables. The mediation analysis approach has become increasingly popular among psychologists. Moreover, it usually involves the random method of participant selection (MacKinnon, et al., 2007).

Participants

The study included 1161 university L2 learners from various universities and colleges in Regions XI and XII, Philippines. Using stratified random sampling, participants were selected to ensure representation across diverse programs and disciplines. Inclusion criteria for

participation were: (1) current enrollment as a university L2 learner, (2) access to online platforms for survey completion, and (3) at least basic familiarity with AI technology. Exclusion criteria were non-student individuals or students outside of the specified regions.

Instrumentation and Data Collection

The study used validated research instruments to measure AI awareness, AI trust, and AI application, adapted from prior studies by Ng et al. (2022) for AI application, and Wang et al. (2023) for AI awareness. Additionally, items for AI trust were based on instruments by Ng et al. (2022), Wang et al. (2023), Carolus et al. (2022), and Choung et al. (2022). All questionnaires employed a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." To ensure validity and

reliability, the scales were assessed using Average Variance Extracted (AVE) for convergent validity and Cronbach's alpha. Minor modifications were made to the wording of the items to ensure clarity and relevance for the specific sample of university L2 learners. Data were collected over one month, using online surveys distributed via Google Forms. The online format facilitated convenient access for participants and allowed for a broader reach across the specified regions.

Statistical Analysis

Descriptive statistics, including mean and standard deviation, were calculated to provide a basic understanding of the data. The Jamovi software (version 2.0) was used to analyze the

descriptive data and to check the reliability and validity of the measurement scales. For mediation analysis, SmartPLS (version 4.0) was employed using the bootstrapping method,

which provided estimates of direct, indirect, and total effects in the proposed mediation model. Path coefficients, along with their significance levels, were examined to

determine the strength and direction of the relationships among AI awareness, AI application, and AI trust.

Results

The results presented in Table 1 illustrate the indicator loadings for three key constructs: AI Application, AI Awareness, and AI Trust. With AI Awareness, the indicators (AI-Aw1, AI-Aw2, and AI-Aw3) demonstrated high loadings ranging from 0.831 to 0.875, indicating that learners comprehend the importance and implications of AI. These high loadings indicate that learners understand AI concepts effectively, which is crucial for enhancing their engagement with AI technologies. The results for AI applications are likewise positive, ranging from 0.805-0.877. This demonstrates that students are highly adept at applying what they have learned about artificial intelligence to a variety of situations. The intensity of these loadings suggests that AI applications play an essential moderating role

in the relationship between AI awareness and AI trust (Shahzad et al., 2024). Consequently, according to Obenza et al. (2024), university students had a positive attitude and an adequate comprehension, knowledge, and perception of the advantages and disadvantages of generative AI along with a positive attitude and intent to use it in higher education.

The significant correlation between these loadings, which vary from 0.789 to 0.853, indicates that learners are more likely to trust AI systems when they are comfortable using AI principles. These AI Trust indicators (AI-Tr1-AI-Tr4) suggest that users are more likely to trust AI systems when application competency is higher.

Table 1. Indicator Loadings

	AI-Application	AI-Awareness	AI-Trust
AI-Aw1		0.831	
AI-Aw2		0.875	
AI-Aw3		0.871	
AI-L-Ap1	0.805		
AI-L-Ap2	0.855		
AI-L-Ap3	0.847		
AI-L-Ap4	0.876		
AI-L-Ap5	0.877		
AI-L-Ap6	0.822		
AI-Tr1			0.789
AI-Tr2			0.853
AI-Tr3			0.85
AI-Tr4			0.824

Table 2 explores the notions of AI application, AI awareness, and AI trust, as well as their validity and reliability. The statistical metrics used in this study were Cronbach's alpha, average variance extracted (AVE), and composite reliability. In terms of AI application, a Cronbach's alpha score of 0.921 indicates that the items measuring this construct have strong internal consistency. This is supported further by composite reliability (ρ_a) of 0.922 and composite reliability (ρ_c) of

0.939, both of which are greater than the widely accepted criterion of 0.70 for trustworthy measures (Hair et al., 2019). Furthermore, as cited by Obenza et al., (2024) according to Taber (2018), Cronbach's alpha values equal to or beyond 0.7 signify satisfactory levels of reliability. The average variance extracted (AVE) score of 0.718 demonstrates convergent validity, indicating that the AI Application's indicators account for a significant portion of the variation. Fornell

and Larcker (1981) define an AVE value greater than 0.50 as the construct's correct representation of the underlying notion. Similarly, AI Awareness is highly reliable, with a Cronbach's alpha of 0.824, indicating strong internal consistency. The composite reliability ratings, which measure how well the AI Awareness components interact, are 0.834 and 0.894. The AVE score of 0.738 indicates convergent validity, which means that the indicators explain a significant portion of the variation in this concept (Cheung et al., 2024). AI Trust's Cronbach's alpha of 0.853 indicates that it is also highly trustworthy. The composite reliability ratings ($\rho_a = 0.875$ and $\rho_c =$

0.898) demonstrate the construct's internal consistency. One drawback of Cronbach's alpha is its potential to underestimate reliability if the tau-equivalence assumption is not met. Consequently, it is advisable to use it in conjunction with other reliability metrics such as composite reliability (ρ_c) and the reliability coefficient (ρ_a) (Hair et al., 2021). However, while the AVE score of 0.688 is acceptable, it is much lower than the AI Application and AI Awareness ratings. According to Fornell and Larcker's (1981) criterion, the indicators for AI Trust continue to accurately depict the essential principles.

Table 2. Cronbach Alpha

	Cronbach's alpha	Composite reliability (ρ_a)	Composite reliability (ρ_c)	Average variance extracted (AVE)
AI-Application	0.921	0.922	0.939	0.718
AI-Awareness	0.824	0.834	0.894	0.738
AI-Trust	0.853	0.875	0.898	0.688

Table 3 presents a comprehensive assessment of university L2 learners' AI application, AI awareness, and AI trust. AI Application, with a mean score of 3.32, indicates that learners have a moderate level of proficiency in applying AI concepts in a range of scenarios. This conclusion is consistent with current literature, which suggests that while learners are conversant with AI technology, there is still a gap in their practical application abilities (Zhao et al., 2022). The median (3.33) is quite close to the mean, indicating a symmetric distribution of responses. The mode is 3, indicating that the most commonly reported degree of AI application is moderate. The standard deviation of 0.871 indicates some variation in learners' self-reported application capabilities, implying that while many learners are talented, others may be less confident in their AI application abilities (Kasinidou et al., 2024).

The mean AI Awareness score of 3.65 suggests that students are moderately aware of artificial intelligence and its effects. This is consistent with research highlighting the importance of consciousness as a foundation for developing better comprehension and

capacities in AI (Wang et al., 2024). The median (3.67) supports this conclusion, indicating that half of respondents had an awareness level higher than this amount. The mean is 4, showing that a substantial percentage of learners consider their knowledge of AI to be comprehensive. The standard deviation of 0.824 indicates that there is still a lot of variation in the responses, with some students expressing lower levels of awareness (Ng et al., 2023).

The mean AI confidence score of 3.20 indicates that learners have a modest level of confidence in AI systems. The median (3.00) is slightly lower than the mean, indicating that while some learners have a high degree of trust in AI technology, others may have doubts or reservations. Previous research has demonstrated that customers' understanding and experiences with AI technologies may influence their trust in AI systems (Kaplan et al., 2021). The mode of 3.0 indicates that the most common response is in the moderate trust category. The standard deviation of 0.806 indicates that trust levels are less variable than those of AI applications, implying that learners' confidence in AI is more evenly distributed.

Table 3. Status of university L2 learners' AI application, AI awareness, and AI trust

	N	Mean	Median	Mode	SD
AI Application	1161	3.32	3.33	3	0.871
AI Awareness	1161	3.65	3.67	4	0.824
AI Trust	1161	3.2	3	3	0.806

Table 4. Bootstrapping Results, Indirect Effects, and Mediation Analysis Results

Bootstrapping Results					
	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AI-Application -> AI-Trust	0.329	0.329	0.029	11.406	0
AI-Awareness -> AI-Application	0.509	0.51	0.026	19.439	0
AI-Awareness -> AI-Trust	0.357	0.358	0.03	12.09	0
Indirect Effects					
	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AI-Awareness -> AI-Trust	0.167	0.168	0.017	9.652	0
Mediation Analysis Results - Confidence Intervals Bias					
	Original sample (O)	Sample mean (M)	Bias	2.50%	97.50%
AI-Awareness -> AI-Trust	0.167	0.168	0	0.134	0.202

Assessment of Structural Model

Table 4 presents the bootstrapping results offers important insights into the connections between AI Awareness, AI Application, and AI Trust among university L2 learners. The evidence, as shown demonstrates the robustness of these associations and validates the mediation study about the indirect impacts of AI Awareness on AI Trust through AI Application.

The study discovered a significant direct impact of AI application on AI trust, with an original sample coefficient of 0.329 and a T-statistic of 11.406 ($p < 0.001$). This study found that as learners' ability to apply AI knowledge increases, so does their trust in AI systems. The large T-statistic indicates a strong and extremely significant connection, emphasizing the importance of practical AI applications in building trust in AI technology (Kassim et al., 2023).

Furthermore, AI Awareness has a direct effect on AI Application, with a coefficient of 0.509 and a T-statistic of 19.439 ($p < 0.001$). This indicates that a higher level of awareness regarding AI significantly enhances learners' competence in applying AI concepts. The strong significance of this relationship highlights the importance of raising AI awareness to promote effective AI application among learners (Li et al., 2022).

The correlation between AI Awareness and AI Trust is substantial, with a coefficient of 0.357 and a T-statistic of 12.09 ($p < 0.001$). This shows that learners with a higher understanding of AI technology are more likely to trust these systems.

AI Awareness has an indirect impact of 0.167 on AI Trust through AI Applications (t-statistic = 9.652; $p < 0.001$). This high degree of statistical

significance suggests that AI Application plays an important role in the relationship between AI Awareness and AI Trust. The findings imply that as students are taught about AI technology, they are better able to apply that knowledge, increasing their trust in AI systems. This moderating influence of AI Applications emphasizes the need to include actual application skills throughout AI education (Ng et al., 2023).

The mediation analysis findings show that the path from AI Awareness to AI Trust has a coefficient of 0.167, which is similar to the sample mean of 0.168. The bias is low at 0, indicating a solid estimation. The 95% confidence interval spans from 0.134 to 0.202, showing that this impact is statistically significant because the interval excludes zero. This finding shows that AI awareness has a consistent, positive indirect impact on AI trust via the suggested mediation paradigm.

Furthermore, this notion highlights the role of AI applications in bridging the gap between AI awareness and trust. Mediation analysis is used to assess the mediating effects, allowing researchers to investigate how AI applications affect the degree and direction of the link between awareness and trust (Obenza et al.,

2024). Thus, the idea is that enhanced AI awareness leads to improved AI application skills, which boosts trust in AI systems. This relationship can be illustrated using a route model, in which the direct paths from AI awareness to AI application and from AI application to AI trust are compared to the indirect path from AI awareness to AI trust through AI application.

The confidence interval for the indirect effect of AI Awareness on AI Trust is 0.134–0.202, with a zero bias. The fact that this gap does not reach zero indicates the presence of mediation. This range indicates that the impact of AI Awareness on AI Trust through AI Application is both statistically significant and practically important. While, in their study "The Nexus between Cognitive Absorption and AI Literacy of College Students as Moderated by Sex," Obenza et al. (2024) report that they investigated college students' attitudes and adoption of AI and related technologies and discovered fascinating dynamics in which sex played a significant role. They observed that male students are more engaged in artificial intelligence and technology, spend more time on computers and mobile devices, and have higher levels of technical skill, awareness, and understanding.

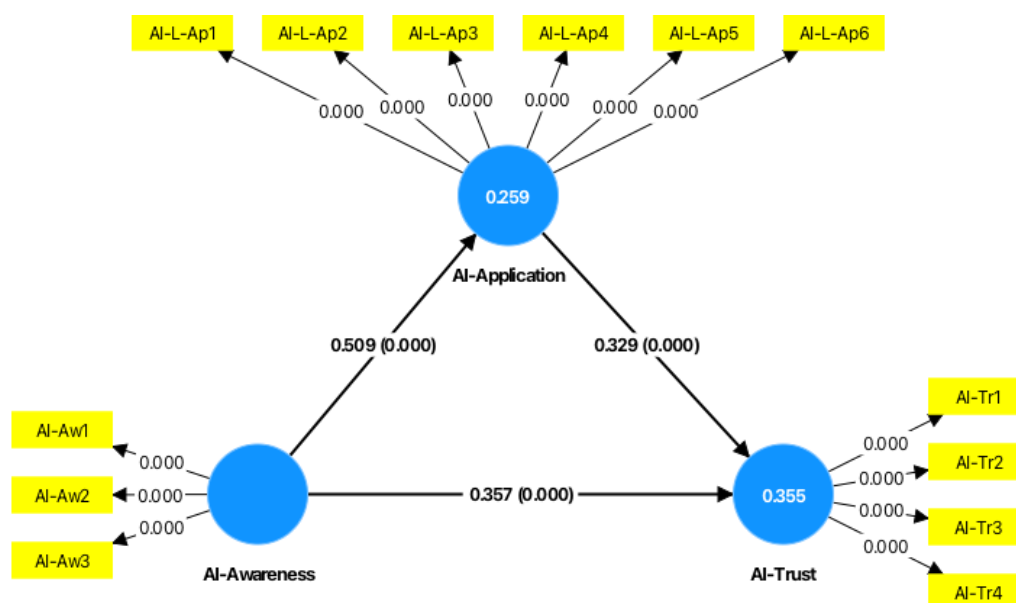


Figure 1: Partial least squares structural equation modeling (PLS-SEM) Results using Smart PLS 4.0

Discussion

Students are better equipped to evaluate AI applications if they understand their limitations and strengths. This is consistent with the findings of Li (2023) and Shahzad et al. (2024), who demonstrated that increased awareness positively improved students' attitudes about the use of AI technology. Furthermore, Hassan (2024) revealed that effective communication with AI systems is directly linked to a solid foundation of AI awareness.

However, according to Obenza et al. (2024), the study conducted by Yadrovskaia et al. (2023) shows that respondents have a positive attitude toward the use of artificial intelligence, even if they do not fully understand the basic principles of these technologies, which is supported by Gerlich (2024), who states that the perceived benefits of AI, such as increased efficiency and innovation, contribute to its acceptance.

This mediating role highlights the importance of students' ability to broaden their knowledge and apply what they have learned in real-world settings (Nagelhout, 2024). Choung et al. (2022) revealed that students' evaluations of the usefulness and usability of AI-based

technologies had a substantial impact on their behavioral intentions and actual usage, highlighting the relevance of real-world application in developing trust.

When learners are comfortable with AI systems, they are more inclined to trust and interact with them. This trust can improve their educational experience, making AI a valuable tool in schools (Seo et al., 2021). According to this relationship, encouraging the usage of AI through real-world applications and experiential learning might increase students' trust. Improved practical skills can significantly influence students' trust in AI systems (Kaplan et al., 2021; Zhai et al., 2024; Walter, 2024). Furthermore, it was said that openness and hands-on experience with AI technology are essential for building trust (Hovsepyan, 2024).

Additionally, as learners get more familiar with AI technology, they have a greater understanding of its potential and limits. This greater understanding gradually transforms their perceptions of these systems, leading in a more informed user base capable of critically assessing AI applications (Obenza et al., 2024).

Conclusion and Recommendation

The findings reveal a significant relationship between AI awareness and AI application, indicating that learners who are more educated about AI technology are better able to apply these concepts in a variety of scenarios. With high indicator loadings for AI awareness and AI application, learners clearly understand AI ideas and can apply their knowledge in real-world situations. These findings emphasize the need to improve AI knowledge as a foundation for establishing competent AI application skills in students.

Furthermore, the study uncovers a significant relationship between AI application and AI trust, indicating that as learners get more skilled at applying their AI knowledge, their trust in AI systems increases. The mediating function of AI applications in the connection between AI awareness and AI trust reinforces this relationship even further. The indirect effect of AI awareness on AI trust through AI

application is statistically significant, indicating that learners' trust in AI systems is influenced by their awareness and practical application skills. This highlights the need to create an environment where students may interact with AI technology through hands-on activities to build trust.

This study on the mediating role of AI application in the relationship between AI awareness and AI trust could have far-reaching ramifications, notably for education, technology, and AI system trust. The findings may indicate that increased awareness of AI, when combined with practical applications, might foster confidence. This could encourage educational institutions to prioritize AI literacy not only in theory but also in real-world applications, offering students hands-on exposure with AI. Furthermore, educators might incorporate AI applications into classes focused on digital literacy or ethics, enhancing

students' confidence and trust in utilizing AI responsibly.

It emphasizes the need of real experiences with AI in building user trust in the technology. Organizations and developers may be urged to focus on transparency, making AI applications accessible and intelligible to

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users, so progressively building confidence. Furthermore, it may imply that fostering trust through hands-on experience can minimize hesitation in embracing AI. This may be relevant in public sectors such as education, healthcare, and government, where user trust is critical to successful implementation.

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