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Determinants of AI Trust in Education: The Role of Ethical Awareness, Ethical Risk, and Human-Centered Orientation

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ABSTRACT

The development of Artificial Intelligence in Education (AIED) is increasingly being used by university students in Indonesia, particularly through generative chatbots and AI-based learning systems to support assignment writing, reference searches, and material comprehension. Although offering efficiency and academic support, the use of AIED also raises ethical issues such as academic integrity, data security, bias, transparency, and responsibility, indicating that student trust is not only determined by the benefits of technology, but also by ethical awareness and human-centered orientation of use. This study aims to analyze the influence of AI Ethical Awareness, Perceived Ethical Risk, Perceived Usefulness, and Human-Centered Orientation on AI Trust, as well as the role of AI Trust in shaping Ethical Awareness in AIED among university students in Indonesia. The study used a quantitative approach with a cross-sectional survey design. Data were collected using a Likert scale questionnaire that measured six main constructs, then analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to test the validity, reliability, and structural relationships between variables. The results showed that perceptions of the benefits of AIED, human-centered orientation, and ethical awareness contributed positively to the formation of students' trust in AIED, while perceptions of ethical risks tended to weaken that trust. Furthermore, trust in AIED plays an important role in increasing students' ethical awareness in the use of AI in academic environments. These findings emphasize the importance of strengthening AI ethics literacy and applying human-centered principles in AIED policies and designs to encourage more responsible use of AI in higher education.

1. INTRODUCTION

The development of Artificial Intelligence (AI) in global education continues to show progress, particularly through its use in adaptive learning, learning analytics, and assessment automation. Projections indicate that the use of AI in the education sector will experience steady growth until 2030 [1], accompanied by an increase in the adoption of generative technology of up to 12% per year [2]. While it can increase efficiency and innovation, it is also important to pay attention to ethical issues such as algorithmic bias, data protection, and system transparency. International institutions also emphasize the importance of implementing artificial intelligence (AI) based on the principles of fairness, accountability, and human orientation.

In the Indonesian context, the use of Artificial Intelligence in Education (AIED) is growing through the integration of virtual tutors, educational chatbots, and teaching robots. This type of teaching has a positive impact on student engagement and learning outcomes [3]. Its implementation is also in

line with the objectives of the Independent Curriculum, which supports independent learning and a student-centered approach [4]. However, educators' readiness to understand the technical, pedagogical, and ethical aspects of artificial intelligence (AI) still requires attention [5]. In addition, international artificial intelligence (AI) ethical guidelines emphasize the importance of using technology in line with human values and social responsibility [6]. Although research on AIED in Indonesia is growing, most of it still focuses on technical aspects rather than ethical issues or psychological factors that influence technology acceptance.

International studies show that user trust in artificial intelligence (AI) is determined by perceptions of benefits, understanding of ethics, perceptions of risk, and human-centered orientation, all of which influence user decisions when interacting [7]. However, to date, there has been no comprehensive research in Indonesia examining the relationship between these factors simultaneously in the context of AIED, especially among students as active users of generative technology. The absence of research on the influence of AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), and Human-Centered Orientation (HCO) on AI Trust (TRU), as well as the impact of TRU on Ethical Awareness in AIED (EAA), indicates a significant gap in the literature. Based on these needs, this study was designed to analyze the factors that influence students' trust in artificial intelligence (AI) and its contribution to the formation of ethical awareness in the use of AIED in higher education. The PLS-SEM approach was used to provide a more in-depth empirical understanding of students' ethical behavior in utilizing AI technology in higher education environments.

2. METHOD

This study uses a quantitative approach with a cross-sectional design to analyze various factors that influence ethical awareness of the use of Artificial Intelligence in Education (AIED) among active students in Makassar City [8]. This approach was chosen because it is able to describe the relationship between variables at a certain point in time without direct intervention on the participants. This design is considered relevant to the research objectives, which focus on understanding the level of ethical awareness among students in the use of AIED systems in the context of digital learning. The quantitative approach is also used to produce objective, measurable, and generalizable data about the student population as a whole [9].

Research participants consisted of active students from various public and private universities in Makassar. Students were selected because they are direct users of artificial intelligence (AI)-based technologies such as ChatGPT, Google Bard, and Ruangguru AI in academic activities. Participant criteria included: (1) active students enrolled at universities in Makassar, (2) having experience or knowledge of using AIED in learning, and (3) willing to be respondents by completing the questionnaire. The city of Makassar was chosen because it is one of the largest centers of higher education in Eastern Indonesia with a high level of technology adoption and a diverse student population that is representative of the academic population. The study population included all active students at universities in Makassar City, while sampling used purposive sampling, as only students who met the criteria relevant to the study were involved. The sample size was determined using the Slovin formula with a 5% error rate, resulting in 86 samples [8]. This number was considered adequate for analysis using the Partial Least Squares Structural Equation Modeling (PLS SEM) method.

The research tool was a closed questionnaire developed based on adaptations from several previous studies. The measurement of the Artificial Intelligence Ethical Awareness (AEA) variable refers to the AI Ethical Reflection Scale (AIERS) by [10], while the Perceived Ethical Risk (PER) variable is adapted from a study by [9]. The constructs of Human-Centered Orientation (HCO) and AI Trust (TRU) were developed based on literature such as "Human-Centered Artificial Intelligence in Higher Education: A Framework for Systematic Literature Reviews," which emphasizes a human-centered orientation and trust in AI in the context of digital learning. The questionnaire consisted of two parts, the first part containing demographic data of respondents (gender, age, study program, and experience using AI), and the second part containing six main research constructs, namely AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), Human-Centered

Orientation (HCO), AI Trust (TRU) as mediating variables, and Ethical Awareness in AIED (EAA) as the dependent variable [11].

Table 1. Research Instruments

No	Variabel	Statement Items	Statement No.	Reference
1	AI Ethical Awareness (AEA)	I understand the ethical implications of using AI in academic research.	1–3	Ziying Wang, Ching-Sing Chai, Jiajing Li, and Vivian Wing Yan Lee (2025), Henchiri, M., & Al Aamri, A. (2025)
		I can distinguish between acceptable and unethical AI-assisted writing practices.		
		I use AI responsibly to ensure the authenticity and integrity of my academic work is maintained.		
2	Perceived Ethical Risk (PER)	I recognize that the use of AI without ethical boundaries can lead to violations of academic or professional integrity.	4–6	Korol, E. A., & Lyashenko, V. V. (2024) Prameswari, L. P. A., & Astika, I. G. (2023)
		I find it confusing who is responsible if AI generates errors or biases.		
		I have doubts about whether my personal data is safe when using AI.		
3	Perceived Usefulness (PU)	I feel like my learning abilities improved after using AI.	7–10	Henchiri, M., & Al Aamri, A. (2025) Khraief, H., Bou Nassif, A., Aldosary, A., & Serhani, M. A. (2023).
		AI helps me complete academic assignments or work faster and efficiently.		
		AI provides accurate and timely information and assistance when I need it.		
		With AI, I was able to access a variety of learning resources that broadened my horizons.		
4	Human-Centered Orientation (HCO)	I feel confident in my ability to use AI effectively in completing my tasks.	11–15	Falebita, O. S., & Kok, P. J. (2024) Mahmud, A., Mohamed Noh, N., & Baba, I. (2023).
		I understand how the basic AI I use works so that I can make the most of it.		
		I feel like I remain in control of the final decision despite using the help of AI.		
		I feel comfortable experimenting and solving problems when using AI.		
		I can customize how to use AI according to my context, type of assignment, or learning needs.		
5	AI Trust (TRU)	I believe that the information provided by AI is generally accurate and I can rely on.	16–20	Khraief, H., Bou Nassif, A., Aldosary, A., & Serhani, M. A. (2023).
		I believe the AI I use works stably and according to its function.		
		Even though I don't fully understand how AI works, I still believe that the tool produces accurate results.		
		I feel that the results that AI provides are generally consistent and in line with my expectations.		
		I believe AI is reliable to help me whenever I need it.		
6	Ethical Awareness	I feel like I need to understand more about ethical issues in order to be able to use AI responsibly.	21–23	Ziying Wang, Ching-Sing Chai,

No	Variabel	Statement Items	Statement No.	Reference
	in AIED (EAA)			Jiajing Li, and Vivian Wing Yan Lee (2025)
		I am careful that the use of AI does not violate the privacy of my personal data or that of others.		
		I think there needs to be a clear division of responsibility within organizations that use AI, as well as scenarios and how to deal with negative impacts when they occur.		

This research tool covers six constructs, with a 1–5 Likert scale. All indicators are compiled to measure ethical understanding in the use of AI (AEA), perceptions of potential moral and academic risks (PER), assessment of the benefits of AI for learning effectiveness and task completion (PU), AI usage orientation that still places users as the main controllers (HCO), level of confidence in the accuracy and reliability of AI (TRU), and ethical awareness in the context of AIED that emphasizes responsibility, privacy protection, and awareness of negative impacts (EAAs). Overall, these instruments have been adapted to measure attitudes, benefit-risk evaluations, user control, and ethical dimensions in the use of AI in academic settings.

The research procedure was conducted in four main stages. The first stage was the preparation and validation of instruments, which involved experts in the fields of technology ethics and research methodology to ensure the suitability of the statement items with the constructs being measured [12]. Review-based validation is a crucial step to ensure the clarity and accuracy of instrument items in quantitative research. The second stage was the questionnaire distribution process, which was conducted online via Google Forms over a two-week period and distributed through student networks, academic forums, and campus social media in Makassar, in accordance with the findings of [13], which proved that digital survey platforms are effective in reaching respondents widely and quickly. The third stage is data screening, where respondents' answers are verified to ensure the completeness and relevance of the data so that its quality is maintained. The final stage is data analysis, which is carried out using statistical software to test the validity, reliability, and relationship between research variables, as part of the standard stages in quantitative analysis based on structural models.

Data analysis includes two approaches, namely descriptive analysis and inferential analysis. Descriptive analysis is used to provide an overview of the respondents' profiles and their perceptions of AIED through the calculation of mean, median, and standard deviation values. Meanwhile, inferential analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLSSEM) method with SmartPLS 4.0 software, which is suitable for analyzing the relationship between latent variables with complex models and data that are not fully normally distributed [14]. Model evaluation was conducted in two stages, namely the outer model to assess construct reliability and validity through outer loading, Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE), and the inner model to test hypotheses using the bootstrapping technique with 5,000 resampling at a significance level of 5%. Path coefficients, R^2, and f^2 values were used to assess the direction, strength, and effect of the relationship between the research variables [15].

Through this design, this study is expected to provide empirical understanding of the influence of ethical awareness, risk perception, trust in artificial intelligence (AI), and human-centered orientation on the acceptance of AIED systems among university students in Makassar. The results of this study are also expected to serve as a basis for the development of ethical policies in educational technology that are fair, inclusive, and based on human values in the academic environment [16].

After all indicators were declared to meet the criteria in the external model stage, the analysis proceeded to the internal model to test the causal relationship between constructs. The internal model in this study assesses the influence of AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), and Human-Centered Orientation (HCO) on AI Trust (TRU), as well as the influence of TRU on Ethical Awareness on AIED (EAA) as the main endogenous construct. The relationship between constructs was tested by estimating path coefficients to determine the

direction and strength of the influence based on the proposed research model. This approach is in line with the characteristics of PLS-SEM, which focuses on testing the structural relationships between latent variables in causal models [14].

In addition, the significance of each path was tested using a bootstrapping procedure with 5,000 resamples. The evaluation was conducted by considering the t-statistics and p-values as the basis for decision-making on the hypothesis, in accordance with the recommendations in PLS-SEM analysis that places bootstrapping as the main technique for testing the significance of coefficients [17]. Thus, the results of the internal model were obtained through direct testing between latent constructs in accordance with the research hypothesis and are presented in Table 5.

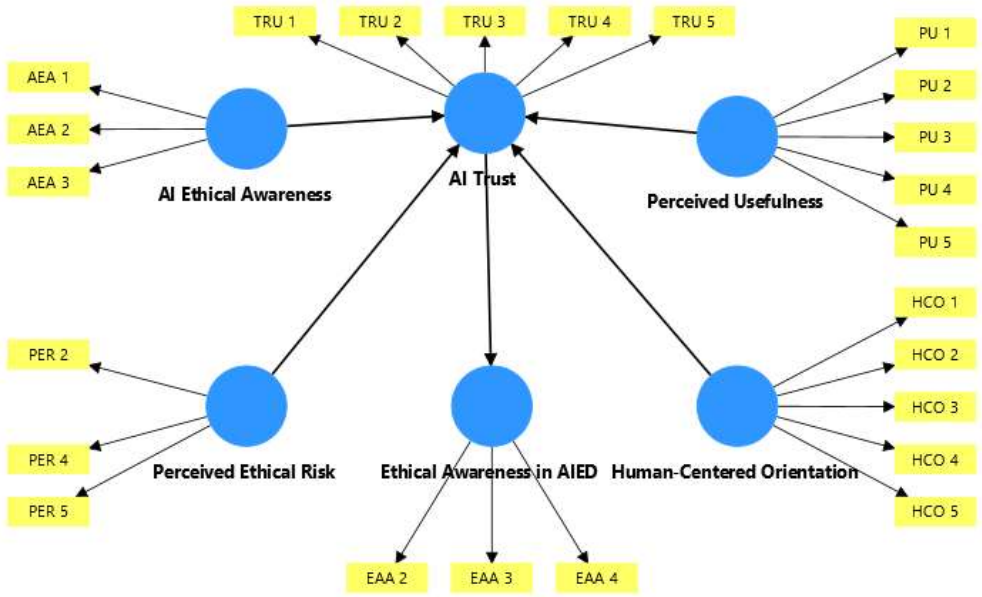

Figure 2. The model proposed in this study

Hypothesis

H1: AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), and Human-Centered Orientation (HCO) significantly influence AI Trust (TRU).

H1a: AI Ethical Awareness (AEA) has a significant effect on AI Trust (TRU).

H1b: Perceived Ethical Risk (PER) has a significant effect on AI Trust (TRU).

H1c: Perceived Usefulness (PU) has a significant effect on AI Trust (TRU).

H1d: Human-Centered Orientation (HCO) has a significant effect on AI Trust (TRU).

H2: AI Trust (TRU) has a significant effect on Ethical Awareness in Artificial Intelligence in Education (EAA).

H3: AI Trust (TRU) mediates the relationship between AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), and Human-Centered Orientation (HCO) and Ethical Awareness in Artificial Intelligence in Education (EAA).

H3a: AI Ethical Awareness (AEA) has a significant effect on Ethical Awareness in Artificial Intelligence in Education (EAA).

H3b: Human-Centered Orientation (HCO) has a significant effect on Ethical Awareness in Artificial Intelligence in Education (EAA).

H3c: Perceived Ethical Risk (PER) has a significant effect on Ethical Awareness in Artificial Intelligence in Education (EAA).

H3d: Perceived Usefulness (PU) has a significant effect on Ethical Awareness in Artificial Intelligence in Education (EAA).

3. RESULTS AND DISCUSSION

A total of 86 respondents participated in this study. To provide a more comprehensive overview of the sample characteristics, the respondents' demographic data is presented in Table 2 below:

Table 2. Respondent Demographic Data

No.	Category	Description	Percentage (%)
1	Gender	Man	30.2
		Woman	69.8
2	Age	17 years	1.2
		18 years old	23.3
		19 years old	57.0
		20 years	16.3
		21 years old	2.3
3	Semester	I	20.9
		III	75.6
		V	1.2
		VII	2.3
4	Force	2022	2.3
		2023	1.2
		2024	72.1
		2025	24.4
5	Department	STEM	53.5
		Non-STEM	46.5
6	Digital Device Ownership	Have a personal device	100
7	Frequency of AI Use	1–2 times/week	7.0
		3–5 times/week	29.1
		Infrequently	4.7
		Every day	59.3
8	The Main Purpose of Using AI	Learn the Basics of Teaching	4.7
		Help with assignment writing	4.7
		Help with assignment writing + studying lecture material	4.7
		Help with writing assignments + searching for references	4.7
		Help with assignment writing + finding references + learning lecture materials	43.0
		Looking for references	32.6
		Looking for references + studying lecture materials	5.8

Referring to Table 2, respondents were predominantly early-stage students with a relatively balanced scientific background between STEM and Non-STEM, and had full access to digital devices. The intensity of AI use was relatively high and had been integrated into daily academic activities,

especially as a tool for writing assignments, searching for references, and understanding lecture materials. This pattern indicates that AI is no longer just an additional tool, but has become an important part of students' learning strategies, although the composition of respondents concentrated in certain groups has the potential to affect the breadth of research result generalization [18].

Convergent Validity dan Construct Reliability

Validity indicators were analyzed to ensure their ability to accurately represent constructs and meet convergent validity and reliability standards. Outer loading values exceeding the recommended threshold indicate that the indicators have a strong correlation with their constructs. Meanwhile, high CR and rho_A values reflect good internal consistency, and adequate AVE values indicate that the construct is able to explain the variance of the indicators predominantly compared to measurement error. Therefore, the results of this evaluation show that all constructs in the model have good measurement quality and are suitable for further analysis [19].

Outer Model

Table 3 shows the results of testing the measurement model on latent constructs in PLS-SEM, which include AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), Human-Centered Orientation (HCO), AI Trust (TRU), and Ethical Awareness in AIED (EAA). Each construct is measured using a number of indicators that are evaluated through external load values, rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE).

Table 3. Evaluation Result Convergent Validity and Construct Reliability

Constructs and Items	Outer Loading	Rho_A	Composite Reliability (CR)	AVE
AI Ethical Awareness (AEA)		**0.854**	**0.899**	**0.749**
AEA1	0.882			
AEA2	0.852			
AEA3	0.862			
Ethical Awareness in AIED (EAA)		**0.894**	**0.922**	**0.798**
EAA2	0.946			
EAA3	0.893			
EAA4	0.838			
Human-Centered Orientation (HCO)		**0.911**	**0.932**	**0.732**
HCO1	0.842			
HCO2	0.873			
HCO3	0.830			
HCO4	0.835			
HCO5	0.895			
Perceived Ethical Risk (PER)		**0.793**	**0.862**	**0.677**
PER2	0.726			
PER4	0.864			
PER5	0.871			
Perceived Usefulness (PU)		**0.937**	**0.949**	**0.788**
PU1	0.886			
PU2	0.867			
PU3	0.887			
PU4	0.895			
PU5	0.902			

Constructs and Items	Outer Loading	Rho_A	Composite Reliability (CR)	AVE
AI Trust (TRU)		**0.927**	**0.933**	**0.735**
TRU1	0.865			
TRU2	0.844			
TRU3	0.822			
TRU4	0.882			
TRU5	0.872			

The results of the measurement model test showed that all constructs studied, namely AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), Human-Centered Orientation (HCO), AI Trust (TRU), and Ethical Awareness in AIED (EAA) met the validity and reliability standards recommended in PLS-SEM. All indicators show adequate and consistent measurement quality in representing the measured construct. These findings confirm that the research instrument has been feasible to use as a basis for further structural analysis. Thus, all constructs can be trusted to support hypothesis testing and strengthen research arguments related to the ethical and equitable use of AI in the context of education (TomassMHultt, n.d.).

Discriminatory Validity

Table 4 shows the results of the discriminant validity test using the Fornell-Larcker approach in the PLS-SEM model [21]. Based on the analysis results, the AVE square root value for each construct is greater than the correlation value of other constructs. This indicates that each construct has a good level of discrimination and is able to represent its concept specifically without overlap between latent variables. Thus, it can be concluded that all constructs have met the discriminant validity criteria in accordance with the Fornell-Larcker standard. These results confirm that the measurement model is of good quality, as each construct is measured uniquely and does not show problems of multicollinearity or redundancy between variables.

Table 4. Criteria Validity Test Results Fornell-Lacker

	AI Ethical Awareness	***AI Trust***	***Ethical Awareness in AIED***	***Human-Centered Orientation***	***Perceived Ethical Risk***	***Perceived Usefulness***
AI Ethical Awareness	0.865	0.611	0.610	0.691	0.705	0.602
AI Trust	0.611	0.857	0.502	0.724	0.468	0.718
Ethical Awareness in AIED	0.610	0.502	0.894	0.717	0.612	0.711
Human-Centered Orientation	0.691	0.724	0.717	0.855	0.699	0.842
Perceived Ethical Risk	0.705	0.468	0.612	0.699	0.823	0.598

The results of the discriminant validity test using the Fornell–Larcker criteria show that all constructs in this study, namely AI Ethical Awareness (AEA), Perceived Ethical Risk (PER), Perceived Usefulness (PU), Human-Centered Orientation (HCO), AI Trust (TRU), and Ethical Awareness in AIED (EAA) have met the specified value limits. These findings confirm that each indicator has the strongest correlation with its own construct compared to other constructs, thereby clearly distinguishing the concepts being measured. Therefore, the measurement model is declared discriminatively valid and can be used to continue analysis in the structural model.

Inner Model

Table 5 presents the results of hypothesis testing conducted through PLS-SEM analysis, which provides an overview of the relationships between latent constructs based on path coefficients, t-statistics, and p-values. These results are used as a basis for determining the significance and direction of the relationships between the variables tested in the structural model, so that it can be determined whether the research hypothesis is accepted or rejected.

Table 5. Results of Testing the Relationship between Latent Constructs

Hypothesis	Relationship	Original Sample (O)	T-Statistic	P-Value	Decision
H1a	AEA → TRU	0.286	2.484	0.007	Positive and significant
H1b	FOR → TRU	-0.207	1.937	0.026	Negative and significant
H1c	PU → TRU	0.359	2.913	0.002	Positive and significant
H1d	HCO → TRU	0.369	2.574	0.007	Positive and significant
H2	TRU → EAA	0.502	5.761	0.000	Positive and significant
H3a	AEA → EAA	0.144	2.369	0.009	Positive and significant
H3b	HCO → EAA	0.185	2.218	0.013	Positive and significant
H3c	FOR EAA →	-0.104	1.926	0.027	Negative and significant
H3d	PU → EAA	0.180	2.460	0.007	Positive and significant

The results of the analysis using PLS-SEM show that the research structural model has adequate suitability. The AI Trust (TRU) variable has an R^2 value of 0.652, while Ethical Awareness in AIED (EAA) has an R^2 value of 0.252, indicating that the predictor variables are able to explain a significant proportion of variance in both constructs. Perceived Usefulness (PU) is the strongest factor influencing TRU with a coefficient of $\beta = 0.473$; $p < 0.001$. Human-Centered Orientation (HCO) also contributes significantly to TRU ($\beta = 0.298$; $p < 0.001$), followed by AI Ethical Awareness (AEA) ($\beta = 0.214$; $p < 0.01$). In contrast to these three variables, Perceived Ethical Risk (PER) shows a non-significant negative influence ($\beta = -0.052$; $p > 0.05$). Meanwhile, the relationship between TRU and EAA proved to be strong and significant ($\beta = 0.502$; $p < 0.001$), indicating that students' trust in artificial intelligence (AI) also encourages an increase in their ethical awareness when using AIED.

The results of this study indicate that Perceived Usefulness (PU) is a major factor in the formation of AI Trust (TRU). These findings suggest that students tend to trust Artificial Intelligence in Education (AIED) when the technology provides tangible benefits for their academic activities, such as improving learning efficiency, assisting with task completion, and facilitating access to information. These results are in line with previous studies that confirm that perceptions of ease and usefulness are key determinants in the acceptance and trust of digital technology [22]. When students perceive the practical value of AIED, their level of trust in the system tends to increase. Additionally, the significant influence of Human-Centered Orientation (HCO) on TRU indicates that the design and use of AIED that prioritizes user needs, comfort, and control plays an important role in building trust. Students who feel they have control over final decisions, understand the basic workings of AI, and are able to adapt the use of technology to the academic context show higher levels of trust. These findings are consistent with research stating that a human-centered approach increases users' positive perceptions of artificial intelligence systems and strengthens the relationship of trust between humans and technology [7].

The positive and significant effect of AI Ethical Awareness (AEA) on TRU shows that students with a better ethical understanding of artificial intelligence tend to have higher levels of trust. Ethical awareness enables students to understand the limitations, responsibilities, and potential impacts of AI use, allowing them to assess the reliability and fairness of the system more rationally. This finding reinforces previous research results which state that AI ethical literacy plays an important role in shaping user trust in AI-based technology [23]. Unlike other variables, Perceived Ethical Risk (PER)

did not show a significant effect on TRU. This indicates that students do not focus too much attention on potential ethical risks when interacting with AIED. This condition may be influenced by the increasing intensity and normalization of AI use in daily academic activities, which causes the perception of ethical risk to be relatively lower than the perception of benefits obtained [24].

Furthermore, the strong influence of TRU on Ethical Awareness in AIED (EAA) shows that students' trust in artificial intelligence is closely related to increased ethical awareness in the use of technology. The trust that is formed does not encourage the uncritical use of AI, but rather triggers a reflective attitude towards ethical aspects, such as academic integrity, data protection, and responsibility of use. This finding is in line with international literature which confirms that a high level of trust in AI can encourage users to give more consideration to the ethical dimensions of using this technology [9]. Overall, the results of this study confirm that increasing perceptions of usefulness, strengthening ethical understanding, and applying a human-centered approach are key factors in strengthening students' trust in AIED. This trust then acts as an important mechanism that encourages more ethical, reflective, and responsible use of AI technology in higher education environments.

4. LIMITATIONS

This study has several limitations. First, the design used is cross-sectional, so the results only describe conditions at a single point in time and are unable to capture changes in students' beliefs and ethical awareness of AI over time. Second, all variables were measured through self-perception-based questionnaires, so the findings are highly dependent on the subjective assessments of respondents and are potentially influenced by biases such as the desire to present answers that are considered good. Third, the respondents came from a limited institutional context, so generalizing the results to a broader student population needs to be done with caution because differences in academic culture, campus policies, and access to technology can influence patterns of AI use. Fourth, the research model did not include other factors that may be relevant, such as AI literacy levels, previous experience in using AI, institutional regulations, or learning motivation, which could potentially contribute to the formation of trust and ethical awareness in AIED.

Based on these limitations, it is recommended that further research be conducted using a longitudinal design to observe the development of students' trust and ethical awareness of AI over time. In addition, the use of a mixed (quantitative-qualitative) approach can help explore students' reasons, experiences, and ethical considerations in greater depth than surveys alone. Expanding the sample to universities with different characteristics is also important to increase the generalizability of the findings. Finally, the model can be enriched by adding variables such as AI literacy, technological experience, independent learning, and campus policy support, so that the explanation of the formation of trust and ethical awareness in the use of AI in education becomes more comprehensive.

5. CONCLUSION

This study provides insight into the factors that influence students' trust in AIED and its impact on ethical awareness in the use of AI technology. The results show that perceptions of ease of use, a user-centered approach, and ethical understanding have a significant influence on shaping student trust, while perceptions of ethical risk do not contribute significantly. The trust that is formed then plays a role in increasing students' sensitivity to ethical aspects when utilizing AI technology in academic activities.

Theoretically, this study contributes by presenting a model that combines various factors related to user perception, trust levels, and ethical behavior in the context of AIED use. This approach shows that trust is a key element that links technology perception with user ethical behavior. Methodologically, the use of a structural model provides a comprehensive picture of the relationship between latent variables and enriches empirical studies on the acceptance of AI technology in higher education environments. The practical implications of this research can be applied by educational institutions and technology developers. Higher education institutions can improve AI ethics literacy through structured learning activities, while developers can pay attention to aspects of transparency,

ease of use, and technological benefits to increase student trust. These efforts are important to encourage more responsible use of AI in line with human values.

This study is not without its limitations. The use of a cross-sectional research design limits the ability to draw causal conclusions, and perception-based data collection methods can be biased. In addition, the focus of the study on students in one region means that these findings cannot be fully generalized. These limitations may affect the scope of interpretation and application of the research results. Recommendations for future research include the use of a longitudinal design to observe changes in perception over time, intergroup analysis to identify variations in usage patterns, and the application of a mixed approach or ethics literacy-based intervention to better understand how AIED technology can be used ethically in higher education settings.

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