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Intercultural Sensitivity, Perceived AI Usefulness, and Willingness to Communicate among Indonesian EFL Learners

Anita Kurnia,[1] Yazid Basthomi,[2] Utami Widiati,[3*] Bambang Yudi Cahyono,[4] Tengku Intan Suzila Tengku Sharif [5]

[123]Universitas Negeri Malang, Malang, Central Java – Indonesia, [5]Universiti Teknologi MARA Cawangan Pahang, Bandar Pusat Jengka Pahang – Malaysia

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Abstract

Willingness to communicate is a fundamental pillar of successful language acquisition; however, learners of English as a foreign language in developing countries such as Indonesia often have limited opportunities for real-world intercultural interaction, which can hinder their communicative readiness. As generative artificial intelligence becomes increasingly integrated into language learning, it remains unclear whether its perceived usefulness genuinely fosters intercultural readiness. This study examined whether intercultural sensitivity mediates the relationship between perceived usefulness of artificial intelligence and willingness to communicate in this population. Data were collected from 113 university students through a cross-sectional survey and analyzed using partial least squares structural equation modeling. Results showed that intercultural sensitivity was the strongest predictor of willingness to communicate. In contrast, perceived artificial intelligence usefulness had only a minor direct influence. It did not significantly predict intercultural sensitivity, indicating that the hypothesized mediation was not supported. Perceived artificial intelligence usefulness and intercultural sensitivity appear to function as separate, rather than sequential, contributors to willingness to communicate. These findings suggest that language programs should pair artificial intelligence with structured intercultural learning opportunities rather than treat it as a standalone solution. Future research should test alternative mediators and longitudinal designs to clarify the causal pathways involved.

Keywords: willingness to communicate; intercultural sensitivity; perceived usefulness; generative artificial intelligence; PLS-SEM; Indonesian EFL learners

Introduction

Willingness to communicate (WTC) refers to a learner's psychological readiness to initiate communication and engage in meaningful language use in English as a Foreign Language (EFL) contexts. It is not determined by linguistic ability alone. WTC is a dynamic disposition shaped by cognitive, affective, motivational, and contextual factors (Zhang et al., 2025b), making

[*]**Corresponding Author:** Utami Widiati (utami.widiati.fs@um.ac.id) Jalan Semarang Number 5, Sumbersari, Lowokwaru, Malang, East Java, 65145

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it sensitive to learners' study conditions. In developing countries such as Indonesia, these conditions are often unfavorable. EFL learners have few opportunities to interact directly and authentically with speakers from linguistically and culturally diverse backgrounds. This problem is compounded by examination-oriented curricula, limited class time for spontaneous communicative practice, and classroom cultures that tend to reward accuracy over interactional risk-taking. Together, these constraints may limit not only learners' contact with other cultures but also their willingness to seek it (Mahbub et al., 2024).

Generative AI (GenAI) has emerged as a possible response to these constraints. Indonesian EFL learners are increasingly exposed to AI tools, even as they continue to lack sustained intercultural contact (Barnes et al., 2024; Zhang et al., 2025a). However, little is known about the psychological mechanisms linking learners' perceptions of AI to their communicative and cultural outcomes. Research on AI-related digital readiness has focused largely on educators (Kohnke et al., 2023), while learner-focused studies have tended to examine task-level linguistic accuracy and performance rather than broader psychological and intercultural dispositions. The existing evidence is also fragmented. Studies on AI and WTC (Ebadi et al., 2025; Wang & Wen, 2025) rarely measure intercultural sensitivity, and studies on AI and intercultural sensitivity (Sultan et al., 2025; Zhang et al., 2025a) rarely extend to communication behavior. Consequently, it remains unclear whether these two outcomes arise independently from perceived AI usefulness, or whether intercultural sensitivity mediates the relationship between perceived AI usefulness and communication readiness.

Intercultural sensitivity deserves particular attention because it is closely tied to learners' readiness to communicate. It reflects learners' capacity to recognize, appreciate, and respond appropriately to cultural differences. Although related to intercultural competence, the two constructs are distinct. Intercultural competence encompasses the cognitive, behavioral, and affective skills needed for effective intercultural interaction. In contrast, intercultural sensitivity refers specifically to the affective readiness (emotional openness, confidence, and engagement) that underlies and precedes competent intercultural behavior (Chen & Starosta, 2000). As an affective dimension of intercultural communicative competence grounded in empathy, openness, and adaptability, intercultural sensitivity has been shown to predict learners' WTC and to support confident engagement in intercultural communication (Fathi et al., 2023). If AI can foster this disposition, it may also indirectly strengthen learners' readiness to speak.

The Technology Acceptance Model (TAM) can examine learners' perceptions of AI, where perceived AI usefulness refers to learners' beliefs that AI tools can enhance their performance and effectiveness in language-learning activities (Davis, 1989; Wu et al., 2024). These tools are far from uniform. They include writing assistance, conversational practice, automated feedback, and simulated cultural interaction, and learners' judgments of usefulness may vary by function (Wu et al., 2024). Their potential is increasingly recognized in English language instruction (Alhalangy & AbdAlgane, 2023). Conversational AI tools are

especially relevant here because they offer relatively low-pressure, judgment-free practice environments (Tai & Chen, 2023), where learners can explore culturally situated communication scenarios without the social pressure of face-to-face interaction (Klimova & Chen, 2024). This is consistent with broader evidence that structured digital interaction can improve learners' intercultural communicative effectiveness by exposing them to diverse cultural perspectives (Liu et al., 2025).

Building on this potential, empirical studies have linked perceived AI usefulness to both WTC and intercultural sensitivity. AI-mediated interaction has been associated with greater WTC because it eases the psychological burden of making errors, reduces speaking anxiety, and encourages learners to initiate communication more often (Ebadi et al., 2025; Wang & Wen, 2025). Perceived AI usefulness has also been associated with higher intercultural sensitivity, as combining AI literacy and cultural literacy may help learners interpret and adapt to cultural cues on digital platforms (Sultan et al., 2025). Related work shows that cognitive flexibility, which allows individuals to consider multiple perspectives, predicts intercultural sensitivity among university students (Alzoubi & Alsalhi, 2025). When these findings are read together, they point to a possible chain. Learners who find AI useful for engaging with diverse linguistic and cultural perspectives may become more open to cultural differences. This sensitivity may, in turn, be associated with greater readiness to communicate in English (Aladini & Gheisari, 2025; Wang & Wen, 2025). The proposition also aligns with evidence that technology-related variables often affect communication outcomes indirectly, through psychological mediators, rather than directly (Lee et al., 2024; Zhang et al., 2025b). A mediation model suits this examination because it separates the association between a predictor and an outcome into direct and indirect components (Hair & Alamer, 2022). Since the pathway has not been tested directly, it remains exploratory. Because the present design is cross-sectional, the study can establish statistical association but not temporal or causal sequence.

Drawing on these gaps, this study pursues two research objectives. First, it examines the association between perceived AI usefulness and WTC among Indonesian EFL learners. Second, it determines whether intercultural sensitivity mediates this association. Four hypotheses guide the analysis. Perceived AI usefulness is expected to be significantly and positively associated with intercultural sensitivity (H1) and with WTC (H2). Intercultural sensitivity is expected to be significantly and positively associated with WTC (H3). Finally, intercultural sensitivity is expected to significantly mediate the relationship between perceived AI usefulness and WTC (H4), so that perceived AI usefulness is indirectly associated with communication readiness through learners' intercultural sensitivity. By pursuing these objectives, the study seeks to clarify how learners' perceptions of AI relate to their readiness for English communication and to offer theoretical and practical implications for AI-integrated language education.

Method

Research Design

This study employs a quantitative cross-sectional survey design to test a hypothesized mediation model in which perceived AI

usefulness is associated with EFL learners' WTC through intercultural sensitivity. Analysis used partial least squares structural equation modeling (PLS-SEM) to assess direct and indirect effects simultaneously (Creswell & Creswell, 2018; Hair et al., 2022).

Participants

The population comprised active Indonesian EFL university students with prior experience using generative AI (GenAI) for language learning. Because no suitable sampling frame was available, we used non-probability purposive sampling; we limited participation to respondents who confirmed, via a screening question, that they were active EFL students with GenAI experience. The final sample included 113 EFL students (see Table 1 for demographic details). A priori statistical power analysis, conducted using G*Power software (version 3.1.9.7), indicated that for a structural path involving two predictor variables, a medium effect size ($f^2 = .15$), and a statistical power of .80, a minimum of 68 participants was required; the actual sample size (113 participants) exceeded this threshold, indicating adequate power for the structural model (Hair et al., 2022).

Table 1

Participants' Demographic Information (N = 113)

Demographic information	Number	Percentage (%)
Gender		
Female	84	74.3
Male	29	25.7
Age		
18 – 19 years old	64	56.6
20 – 21 years old	44	38.9
22 – 23 years old	5	4.5
Semester		
1st semester	30	26.5
3rd semester	47	41.6
5th semester	12	10.6
7th semester	24	21.3
Major		
English Language Education	109	96.5
English Literature	4	3.5
University Type		
Public Universities (PTN)	111	98.2
Private Universities (PTS)	2	1.8

Instrument

Table 2
Scales Used in the Study

Construct	Item	Measurement Items (English Version)
Perceived AI Usefulness	AI1	Using AI relieves my fear of judgment in simulating real-life dialogues in English.
	AI2	Using instant feedback from AI increases my productivity in learning English.
	AI3	Overall, I find AI tools useful for preparing myself to interact globally in English.
Intercultural Sensitivity	IS1	I feel confident when interacting with people in English from different cultures.
	IS2	I am pretty sure of myself in interacting in English with foreign speakers.
	IS3	I feel comfortable when dealing with cultural differences using English.
	IS4	I enjoy interacting in English with people from different cultures.
	IS5	I tend to wait for chances to talk in English with people from different cultures.
Willingness to Communicate (WTC)	WTC1	I am willing to express my ideas in English during class discussions.
	WTC2	I am willing to answer questions in English voluntarily, without being called by the teacher.
	WTC3	I am willing to participate in group discussions with my peers using English.
	WTC4	I am willing to give directions to a foreigner using English.
	WTC5	I am willing to engage in online discussions in English.
	WTC6	I am willing to present my opinion in English to a group of people from different cultural backgrounds.

The instrument was a structured online questionnaire comprising informed consent, a GenAI-experience screening question, demographic items, and 14 items measuring three latent variables; the entire instrument was presented in Indonesian to minimize response bias and ensure accurate self-reporting (Podsakoff et al., 2003). Perceived AI usefulness

was measured with three items adapted from Davis (Davis, 1989), and Vo and Nguyen (2024); intercultural sensitivity with five items from Chen and Starosta (Chen, G., & Starosta, 2000), drawn primarily from the interaction confidence and interaction enjoyment dimensions of the original five-dimension Intercultural Sensitivity Scale (which also includes interaction engagement, respect for cultural differences, and interaction attentiveness); as such, the present measure captures a narrower affective slice of intercultural sensitivity than the full construct as originally conceptualized; and WTC with six items adapted from MacIntyre et al. (2001), including one item revised for grammatical clarity (see Table 2). All items used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) with a neutral midpoint to mitigate forced-choice bias, given the novelty of AI for some respondents. We translated the items into Indonesian, reviewed them with subject-matter experts for clarity and cultural appropriateness, and pilot-tested them with 29 respondents (excluded from the main analysis), yielding a Cronbach's alpha of .839 and confirming acceptable reliability.

Data Collections

Data were collected electronically via Google Forms, and the questionnaire was distributed through WhatsApp groups for undergraduate English Department students between December 5 and December 25, 2025. Research permission was obtained from the Vice Dean for Academic Affairs at the Faculty of Letters, Universitas Negeri Malang, and informed consent was secured from all participants prior to questionnaire completion to ensure voluntary participation.

Data Analysis

We analyzed the data using PLS-SEM in SmartPLS 4 because it is robust with non-normally distributed data and suitable for exploratory mediation testing (Hair et al., 2019). The measurement model was evaluated for convergent validity (factor loadings > .70; Average Variance Extracted [AVE] > .50; and Composite Reliability [CR] > .70) and discriminant validity through the Heterotrait-Monotrait (HTMT) ratio (< .90) (Henseler et al., 2015). The structural model was then tested via bootstrapping (5,000 resamples) with a two-tailed significance threshold ($p < .05$; $t > 1.96$) (Hair et al., 2022; Kock, 2015). Furthermore, we examined the coefficient of determination (R^2), effect size (f^2), and specific indirect effects to assess intercultural sensitivity's mediating role between perceived AI usefulness and WTC.

Findings and Discussion

Finding

The measurement model was evaluated first to make sure each construct was measured reliably and validly before the hypothesized relationships were tested. Table 3 reports the outer loadings, internal consistency, and convergent validity of the three constructs. All items loaded strongly on their constructs, with every outer loading above the recommended .70. For perceived AI usefulness, loadings ranged from .710 (AI1) to .918 (AI2), and AI3 was also high at .907. The three items therefore consistently captured learners' beliefs about the value of AI tools, with AI1 contributing somewhat less than the other two. The five intercultural sensitivity items loaded between .710 (IS5) and .885 (IS2), and IS1 (.849), IS3 (.832), and IS4 (.868) also showed strong

indicator reliability. The six WTC items loaded between .703 (WTC4) and .874 (WTC6), with WTC1 (.812), WTC3 (.826), and WTC5 (.826) clustering in the low .80s.

Table 3

Measurement Model Evaluation: Reliability and Convergent Validity

Construct	Item	Outer Loadings	Cronbach's α	CR	AVE
Perceived AI Usefulness	AI1	.710	.817	.886	.724
	AI2	.918			
	AI3	.907			
Intercultural Sensitivity	IS1	.849	.887	.918	.691
	IS2	.885			
	IS3	.832			
	IS4	.868			
	IS5	.710			
Willingness to Communicate (WTC)	WTC1	.812	.888	.915	.644
	WTC2	.764			
	WTC3	.826			
	WTC4	.703			
	WTC5	.826			
	WTC6	.874			

Internal consistency was satisfactory for all constructs. Cronbach's α was .817 for perceived AI usefulness, .887 for intercultural sensitivity, and .888 for WTC, and composite reliability (CR) was higher still, at .886, .918, and .915. Convergent validity was established because every construct's average variance extracted (AVE) exceeded the .50 benchmark, with values of .724 for perceived AI usefulness, .691 for intercultural sensitivity, and .644 for WTC. Each construct therefore explained well over half of the variance in its indicators. The slightly lower AVE for WTC reflects its larger item set and the more moderate loading of WTC4. However, it remained comfortably within the acceptable range.

Discriminant validity and collinearity were examined next. Table 4 reports the HTMT ratios, the model's explanatory and predictive power, and the inner VIF values. The HTMT ratios in Table 4a confirm that the three constructs were empirically distinct, since all values fell below the .90 threshold. The ratio between perceived AI usefulness and intercultural sensitivity was extremely low (.076), meaning the two constructs shared almost no common variance, and this early sign anticipated the non-significant structural path between them. The ratio between perceived AI usefulness and WTC was also low (.235). In contrast, the ratio between intercultural sensitivity and WTC was considerably higher (.836). It stayed below the

cut-off, so the two constructs can be treated as distinct, but the value points to the close conceptual and empirical relationship between learners' intercultural openness and their readiness to communicate.

Table 4

(a) Discriminant Validity: Heterotrait-Monotrait Ratio (HTMT)

	Intercultural Sensitivity	Perceived AI Usefulness	Willingness to Communicate
Intercultural Sensitivity	—		
Perceived AI Usefulness	.076	—	
Willingness to Communicate	.836	.235	—

(b) Structural Model Fit

Endogenous Construct	R^2	Q^2 predict
Intercultural Sensitivity	.002	-.035
Willingness to Communicate	.591	.001

(c) Inner Model Collinearity (VIF)

Structural Path	VIF
Perceived AI Usefulness → Intercultural Sensitivity	1.000
Perceived AI Usefulness → Willingness to Communicate	1.002
Intercultural Sensitivity → Willingness to Communicate	1.002

Table 4b shows a marked difference between the two endogenous constructs. The model explained 59.1% of the variance in WTC (R^2 = .591), indicating substantial explanatory power. In contrast, the R^2 for intercultural sensitivity was only .002, so perceived AI usefulness accounted for just 0.2% of its variance. Predictive relevance was weak for both outcomes. The Q^2predict value for WTC was .001, barely above zero, and the value for intercultural sensitivity was negative (−.035), meaning the model predicted this construct no better than a simple mean benchmark. The model therefore explains WTC within the present sample better than it predicts it in new cases. Table 4c shows that collinearity was not a concern. The inner VIF values were 1.000 for the path from perceived AI usefulness to intercultural sensitivity and 1.002 for both paths to WTC, all far below the conservative threshold of 3.3 (Kock, 2015). The path estimates were therefore not distorted by overlap among predictors.

With the measurement and structural conditions met, the hypotheses were tested to address the two research objectives. Table 5 reports the path coefficients, t-values, p-values, effect sizes, and decisions for each hypothesis.

The first research objective was to examine the association between perceived AI usefulness and WTC among Indonesian EFL learners. Perceived AI usefulness was significantly and positively associated with WTC (β = .178, t = 2.559, p = .011), so H2 was supported. The t-value exceeded the critical value of 1.96. However, the coefficient was modest, and the effect size was small (f^2 = .077) by Cohen's (1988) criteria. Learners who regarded AI tools as useful reported only slightly greater readiness to communicate in English.

Table 5

Hypothesis Testing Results (Direct and Indirect Effects)

Hypothesis	Relationship	β	*t*-values	*p*-values	f^2 values	Result
H1	AI Usefulness → Intercultural Sensitivity	.049	0.343	.732	.002	Not Supported
H2	AI Usefulness → WTC	.178	2.559	.011	.077	Supported
H3	Intercultural Sensitivity → WTC	.739	14.123	<.001	1.334	Supported
H4	AI Usefulness → Intercultural Sensitivity → WTC (indirect)	.037	0.345	.730	—	Not Supported

Note. p-values reflect a two-tailed significance threshold (t > 1.96). Effect size (f2) interpreted per Cohen (1988): .02 = small, .15 = medium, .35 = large

Intercultural sensitivity was a much stronger predictor of WTC (β = .739, t = 14.123, p < .001), supporting H3. This was the largest coefficient in the model, and its effect size (f^2 = 1.334) far exceeded the .35 benchmark for a large effect. It was also more than seventeen times the effect of perceived AI usefulness on WTC. Learners' readiness to communicate was therefore tied much more closely to their affective openness toward cultural difference than to their beliefs about the usefulness of AI.

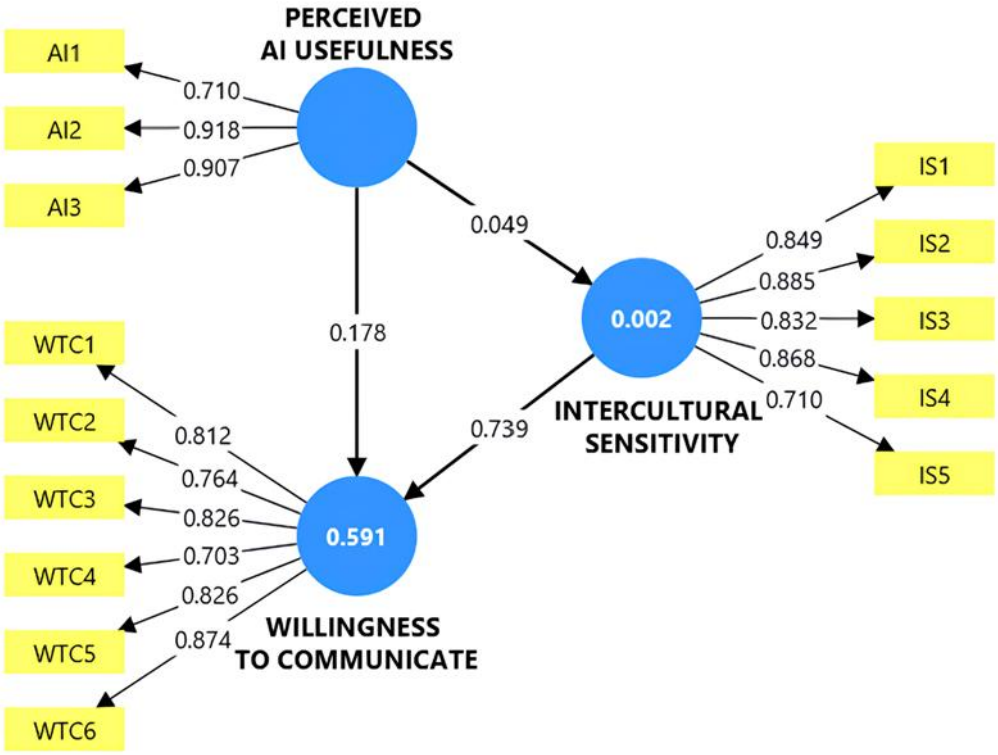
The second research objective was to determine whether intercultural sensitivity mediates the association between perceived AI usefulness and WTC. Mediation requires the predictor to be associated with the mediator, and Table 5 shows that this condition was not met. The path from perceived AI usefulness to intercultural sensitivity was close to zero (β = .049), with a t-value of only 0.343, a p-value of .732, and a negligible effect size (f^2 = .002), so H1 was not supported. Without this first link, the indirect path from perceived AI usefulness to WTC through intercultural sensitivity was also non-significant (β = .037, t = 0.345, p = .730), and H4 was not supported. The data therefore provide no evidence that intercultural sensitivity carries the association between perceived AI usefulness and WTC.

Figure 1 presents these results in the final structural model. The outer loadings confirm each indicator's strength, and the R^2 values show that the model explained a large share of the variance in WTC and almost none in intercultural sensitivity. The path coefficients show a strong link from intercultural sensitivity to WTC, a

weaker but significant direct link from perceived AI usefulness to WTC, and an almost flat link from perceived AI usefulness to intercultural sensitivity. The figure therefore shows that the two predictors relate to WTC through separate paths rather than a single chain.

Figure 1

R^2 values, Loadings, and Path Coefficients of the Structural Model



Taken together, the findings answer both research objectives. For the first objective, perceived AI usefulness is directly but only modestly associated with WTC among Indonesian EFL learners. For the second objective, intercultural sensitivity does not mediate this association, because learners' perceptions of AI are unrelated to their intercultural sensitivity. Perceived AI usefulness and intercultural sensitivity therefore contribute to WTC separately rather than as links in a single chain, and intercultural sensitivity is clearly the dominant factor.

Discussion

This study examined whether intercultural sensitivity mediates the relationship between perceived AI usefulness and WTC among Indonesian EFL learners. Consistent with studies linking AI-supported interaction to reduced anxiety and modestly stronger WTC (Ebadi et al., 2025; Wang & Wen, 2025; Zhi & Wang, 2024), perceived AI usefulness was positively

associated with WTC here. However, the null link between AI usefulness and intercultural sensitivity suggests otherwise. This contrasts with Sultan et al. (2025) but aligns with Alzoubi and Alsalhi (2025), who found that cognitive flexibility, rather than technological utility, drives intercultural sensitivity. Taken together, this suggests that AI usefulness may support learners' readiness to communicate, without necessarily addressing the more affective, culturally rooted readiness that intercultural sensitivity represents. This pattern also warrants caution: although the model fit the data well in explaining WTC, its ability to predict beyond this sample was weak, a discrepancy often overlooked in PLS-SEM reporting and made more pressing by the relatively modest sample size relative to the number of indicators. It is best, then, to treat these findings as a close description of the present sample rather than as evidence of a broadly generalizable pattern. Theoretically, this points to perceived AI usefulness and intercultural sensitivity as two largely independent pathways toward communicative readiness, rather than a single sequential mechanism as originally hypothesized.

Perceived AI usefulness was significantly, though moderately, positively associated with WTC (H2), with a small effect size (Cohen, 1988). This aligns with the Technology Acceptance Model (Davis, 1989) and evidence that AI-supported interactions can ease the psychological burden of making errors (Ebadi et al., 2025; Tai & Chen, 2023). The findings also align with Wang and Wen (2025), who observed a similar boost in speaking confidence among Chinese EFL learners using AI. That said, the moderate effect size suggests perceived AI usefulness is just one contributing factor among several, rather than the main driver of WTC, echoing Zhi and Wang (Zhi & Wang, 2024), who found that EFL students' AI attitude explained only a modest share of WTC variance compared with interpersonal factors such as teacher immediacy.

However, the study's central finding rejects the mediation hypothesis. Intercultural sensitivity did not significantly mediate the relationship between perceived AI usefulness and WTC, likely because the proposed chain was missing a link: perceived AI usefulness was not a significant predictor of intercultural sensitivity to begin with (H1). This result differs from Sultan et al. (2025), who found that AI literacy and cultural literacy jointly predicted intercultural communication competence among Kazakhstani philology students, possibly because of differences in sample, instrumentation, or operationalization. Cultural context may also matter: Indonesia's relatively high collectivism and power distance could shape how learners engage with AI and express intercultural openness (Barnes et al., 2024), in ways that may differ from the context Sultan et al. (2025) examined. The measurement also deserves scrutiny: AI1 largely captures anxiety reduction, AI2 taps productivity, and only AI3 speaks directly to usefulness for global communication. This mix of constructs may have introduced enough noise to obscure a real relationship. Timing may matter as well. Generative AI was still relatively new to Indonesian learners when data were collected in December 2025, so perceived usefulness may not yet have had time to settle into a more stable affective outcome like intercultural sensitivity, which longitudinal designs would be

better placed to capture. This pattern aligns with Alzoubi and Alsalhi (2025), who found cognitive flexibility, not technological utility, to be the stronger predictor of intercultural sensitivity. Put together, perceived AI usefulness, as measured here, appears to function more as a tool for smoothing interaction than as a catalyst for deeper cultural growth, running counter to more optimistic accounts that treat digital tools as inherently supportive of intercultural development (Klimova & Chen, 2024; Zhang et al., 2025a), and extending Klimova and Chen's (2024) review with direct empirical evidence that such benefits may be more conditional than often assumed.

By contrast, intercultural sensitivity stands out as a strong, independent predictor of WTC (H3), with an effect size that far outweighs perceived AI usefulness. This supports existing frameworks that place intercultural competence at the core of communication readiness (Byram, 1997; Chen & Starosta, 2000; MacIntyre et al., 2001) and echoes Mahbub et al. (Mahbub, Moh. Arif., Chotimah, Ima Chusnul., Suryati, Nunung., Basthomi, Yazid., El Khoiri, 2024), who describe intercultural sensitivity among Indonesian EFL learners as a multifaceted quality built through experience. Given how clearly intercultural sensitivity outperforms every other predictor in the model, its development appears to hinge on factors well beyond perceived AI usefulness, at least as conceptualized.

Several limitations should be kept in mind when interpreting these results. The purposively sampled group was demographically homogeneous: most respondents were female (74.3%), enrolled in English language programs (96.5%), and studying at public universities (98.2%). These characteristics limit how far the findings can generalize to more varied groups of EFL learners, including male students, literature majors, and those at private institutions. The screening criterion also left room for ambiguity: participants confirmed they had "experience using generative AI" without specifying how often, for how long, or with what kind of tool, so their actual level of engagement with AI likely varied more than the analysis could capture.

The cross-sectional, self-report design also has its own constraints. It cannot establish causality, nor rule out the possibility that the relationship runs the other way, for instance, that learners who are already more willing to communicate are simply more inclined to see AI as useful. The design also remains vulnerable to common method bias, despite the instrument's procedural safeguards (Podsakoff et al., 2003). The AI usefulness scale's heterogeneous items, noted above, remain a further limitation. The pathway from AI usefulness to WTC may also run through mechanisms other than intercultural sensitivity, such as self-efficacy, reduced classroom anxiety, or foreign language enjoyment (Lee et al., 2024; Zhang et al., 2025b), none of which this study tested directly. Future work would benefit from a more clearly unidimensional AI usefulness measure and from testing multiple candidate mediators side by side. Finally, because the study was conducted within a single national context, interpret the results with this scope in mind.

Despite these limitations, the findings carry real practical weight. Perceived AI usefulness seems to ease the psychological barriers that hinder communication. However, it appears insufficient on its own to build intercultural sensitivity, a claim this study can suggest rather than confirm outright, since it measured

perceived usefulness rather than actual AI use. For EFL programs seeking to strengthen learners' communication readiness, this suggests pairing AI-based training with deliberately structured intercultural engagement, consistent with evidence that intercultural competence grows best through intentional pedagogical effort rather than incidental exposure (Huang, 2021; Sabet & Chapman, 2023). In the Indonesian context specifically, this could take shape as structured virtual exchange partnerships, AI-assisted rehearsal before real intercultural encounters, or reflective journaling that compares AI-simulated scenarios with genuine cross-cultural exchanges (Mahbub et al., 2024). Models that combine digital tools with layered, structured intercultural strategies, such as the triad-layers approach used with Chinese university students, offer a promising direction here (Yang et al., 2025). Future research could explore whether culture-specific AI tools foster stronger links to intercultural sensitivity than general conversational tools, using longitudinal or qualitative designs to trace how this competence develops over time, and by examining actual AI use and behavior rather than relying on perceived usefulness alone. This fits a broader trend in the field, where digital tools are increasingly woven into intercultural communication education, even as human-centered teaching remains central to how learners actually grow (Cong-Lem, 2025).

Conclusion

Overall, this study highlights the crucial role of intercultural sensitivity in shaping WTC among EFL learners in Indonesia, alongside the smaller contribution of perceived AI usefulness. Intercultural sensitivity emerged as the strongest predictor of WTC. In contrast, perceived AI usefulness had a relatively minor impact, though it was statistically significant. Notably, the hypothesis that intercultural sensitivity mediates the relationship between perceived AI usefulness and WTC was not supported, as perceived AI usefulness did not significantly predict intercultural sensitivity. Within the scope of this study's cross-sectional design and measurement approach, AI usefulness and intercultural sensitivity showed no significant sequential relationship in fostering learners' readiness to communicate. However, this finding should be interpreted alongside the measurement limitations discussed above rather than as evidence of a general, context-independent pattern.

These results offer a modest theoretical contribution by suggesting that perceptions of AI usefulness and intercultural sensitivity, at least as conceptualized in this study, may serve as parallel, rather than sequential, predictors of WTC. Such analytical nuance is often absent from research that assumes technology adoption automatically fosters intercultural development; the current findings indicate that this assumption requires deeper empirical scrutiny before being incorporated into WTC models involving AI-based learning.

Practically, this means AI-based language learning tools should not be treated as a substitute for planned, intentional intercultural education. Rather than assuming that interaction with AI will indirectly cultivate empathy and adaptability to cultural differences, EFL programs should complement AI-supported training with explicit, structured activities designed to build intercultural

sensitivity, such as reflective tasks, guided cultural comparisons, and opportunities for authentic intercultural communication.

These findings should be read in light of several limitations: the demographically homogeneous, purposively sampled participants; the cross-sectional, self-report design, which precludes causal claims and cannot rule out reverse or reciprocal relationships; potential heterogeneity within the perceived AI usefulness measure; and the single-country scope. Future research should therefore replicate this model with more diverse samples, use longitudinal or experimental designs to track how AI usefulness and intercultural sensitivity develop over time, test AI tools designed specifically for cultural simulation rather than general conversation, and validate a clearer, unidimensional measure of perceived AI usefulness.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Generative AI Statement

The authors used Grammarly solely for language editing and proofreading to improve the clarity and readability of the manuscript. All AI-assisted output was critically reviewed and revised by the authors, who take full responsibility for the accuracy, integrity, and final content of the manuscript.

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