

Scaffolding Intercultural Competence Development via AI Translanguaging Platforms: An Interactional Sociolinguistic Analysis of Teacher-Student Dialogues in Online Tutorials

Hefang Chen¹, Jia Hao^{2*}

¹College of Foreign Languages, Zhongkai University of Agriculture and Engineering; Guangzhou, Guangdong, 51970, China

²School of Sociology, University of Sanya, Sanya, Hainan, 572000, China

**Author to whom correspondence should be addressed.*

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: During the digital transformation of foreign language education and the increasing integration of artificial intelligence (AI) into pedagogical practices, there is a notable deficiency in understanding how AI translanguaging platforms interactively scaffold the development of intercultural communicative competence (ICC) in online English as a Foreign Language (EFL) context. This mixed-methods study combines a quantitative evaluation of ICC change with a detailed qualitative interactional sociolinguistic analysis. It aims to explore both the efficacy of AI translanguaging platforms in fostering college EFL learners' ICC and the micro-processes through which potential cross-cultural misunderstandings are identified, managed, and resolved in AI-mediated teacher-student tutorial dialogues. Adopting a sequential explanatory mixed-methods design supplemented by a multiple case study approach, the study enrolled 64 non-English major undergraduates and 6 experienced instructors from an applied university in southeastern China. An 8-week AI-assisted online intercultural tutorial intervention was implemented, and quantitative data were collected using a validated ICC scale ^[1]. Qualitative data were analyzed through an integrated theoretical framework of Sociocultural Theory (SCT) and Interactional Sociolinguistics (IS). Quantitative findings reveal a positive effect of AI translanguaging platforms on learners' overall development of ICC, with the largest gains in critical cultural awareness, intercultural awareness, and pragmatic flexibility. Qualitative analysis reveals a two-phase interactional scaffolding process and concludes that AI translanguaging platforms function as dynamic, interactionally embedded scaffolds. Their effectiveness mainly arises from their integration into responsive human dialogue, rather than from autonomous operation. These findings advance a process-oriented model of technology-mediated intercultural learning, provide empirical evidence for digital intercultural language pedagogy, and provide practical implications for EFL instructors, instructional designers, and platform developers seeking to optimize AI-assisted intercultural teaching.

Keywords: AI translanguaging platforms; Intercultural communicative competence; Scaffolding; Interactional sociolinguistics; Online EFL tutorials

Online publication: August 13, 2026

1. Introduction

In an increasingly globalized and digitally interconnected world, intercultural communicative competence (ICC) has emerged as a core educational objective for college EFL learners, extending far beyond linguistic accuracy to encompass intercultural awareness, pragmatic flexibility, critical cultural reflection, and the ability to negotiate meaning across cultural boundaries^[2]. In contexts such as China, a significant participant in global educational exchanges through initiatives like the Belt and Road, the cultivation of ICC serves as both a strategic policy priority and a practical pedagogical challenge. This challenge is intensified by the tension between developing advanced English proficiency and utilizing diverse semiotic resources for effective cross-cultural communication^[3]. The rapid advancement of educational technology has positioned AI translanguaging platforms as pioneering facilitators, incorporating features like live bilingual translation, cultural context annotations, pragmatic strategy guidance, and cross-cultural scenario simulation to address this challenge^[4,5].

Existing research has largely conceptualized AI scaffolding as a static property of the tool rather than an emergent, interactionally co-constructed process^[6]. There is a paucity of fine-grained analysis detailing how AI output enters the conversational floor, how participants orient to or reject this technological contribution, and how cross-cultural misunderstandings are repaired through the interplay of AI support and human dialogue^[7,8]. This gap is both methodological (a lack of mixed-methods research combining statistical measurement with interactional sociolinguistic analysis) and theoretical (an under-specified model of AI as a dynamic mediator in the ZPD).

This study fills these gaps by integrating quantitative ICC assessment with a multiple case study of AI-mediated tutorial dialogues, guided by an SCT-IS framework. Three interrelated core research questions are addressed, moving from macro-level efficacy to micro-level process:

To what extent do AI translanguaging platforms improve college EFL learners' overall ICC and its sub-dimensions (intercultural attitudes, knowledge, skills, critical awareness) in online intercultural tutorials?

From an interactional sociolinguistic perspective, what is the process by which potential cross-cultural misunderstandings are identified, managed, and resolved in AI-mediated teacher-student tutorial talk, and what role does the AI platform's output play in this sequential repair work?

What interactional scaffolding mechanisms link AI translanguaging platform use to measurable gains in learners' ICC, and what pedagogical implications do these mechanisms yield for AI-assisted intercultural EFL teaching?

2. Literature review

In the Chinese EFL context, the *College English Teaching Guide (2020)* explicitly lists ICC as a core teaching objective, yet traditional pedagogies face challenges including limited authentic cross-cultural interaction, linguistic barriers to cultural expression, and shallow critical reflection^[9,10]. Recent research confirms that ICC is situated and interactionally developed—not acquired as a static set of knowledge—but through engaged practice in cross-cultural dialogue^[11,12]. Quantitative studies have demonstrated that technology-enhanced interventions can improve ICC sub-dimensions such as cultural knowledge and attitudinal openness^[13]. However, these studies rarely connect macro-level ICC gains to the micro-interactional practices through which learners negotiate cultural meaning, a gap this study addresses by linking quantitative scores to sequential dialogue analysis.

Translanguaging pedagogy has emerged as a cornerstone of inclusive intercultural language education, validating learners' full linguistic repertoires as resources for meaning-making rather than deficits ^[14]. Empirical studies in Chinese EFL settings confirm that AI-driven tools can foster cultural knowledge and communication skills by providing immersive, personalized support ^[15].

Despite these advances, critical limitations exist. First, most research focuses on linguistic proficiency gains rather than ICC development, with limited attention to how AI translanguaging supports cultural meaning-making ^[16]. Second, studies frequently regard AI tools as autonomous delivery mechanisms neglecting to explore how their outputs are negotiated and contextualized by teachers and students ^[17,18].

The integration of SCT and IS offers a comprehensive theoretical framework for investigating AI-mediated ICC scaffolding, thereby addressing the limitations inherent in single-theory approaches. Although recent scholars have initiated the integration of these theories within the context of digital language education, there remains a paucity of studies that apply them specifically to AI translanguaging and the development of ICC. Kremer & Pinto (2025) call for research into the mutual interconnectedness of AI tools and human interaction in ICC development and the need for fine-grained analysis of how translanguaging and AI support foster sociopragmatic understanding ^[19]. This study responds to these calls by using SCT-IS to analyze how AI translanguaging functions as a mediated scaffold in organizations of tutorial talk.

3. Research methodology

This study adopts a sequential explanatory mixed-methods design ^[20] complemented by a multiple case study approach ^[21] for the qualitative phase. This design is ideal for addressing the research questions, as it first quantifies the efficacy of AI translanguaging for ICC development and then explains the interactional mechanisms underlying these gains through in-depth case study analysis of AI-mediated tutorial dialogues.

3.1. Research context and participants

The research context—online one-on-one intercultural English tutorials—was selected for its ecological validity: online tutorials are a common feature of Chinese college English education, and one-on-one dialogue enables fine-grained analysis of teacher-student-AI interaction (no group interaction noise).

A total of 64 non-English major undergraduates (32 males, 32 females) were recruited, with intermediate EFL proficiency (CET-4 pass rate = 89%, IELTS 6.0 equivalent). Learners were randomly assigned to two groups: Experimental Group (n=32) used an AI translanguaging platform during 8-week online intercultural tutorials; Control Group (n=32) received traditional online intercultural tutorials (PPT, electronic readings) with no AI translanguaging support. Homogeneity in age, proficiency, and academic year was confirmed via independent-samples t-tests ($p > 0.05$ for all variables), ensuring that pre-intervention ICC differences were non-significant.

6 experienced college EFL instructors (5 females, 1 male) participated, with 5–12 years of teaching experience. Three instructors had professional training in intercultural language pedagogy and AI-assisted teaching, and all taught both experimental and control group tutorials to control for teacher effect.

3.2. Research instruments

A self-optimized educational AI translanguaging platform was used, integrating four core functions aligned with intercultural EFL teaching needs ^[22]:

- (1) Real-time Chinese-English translation/glossing: Instant translation of words/phrases, with lexical and cultural connotation notes.
- (2) Cultural context annotation: Automatic annotation of cross-cultural concepts (e.g., “extended family,” “guanxi”) with cultural background and pragmatic use.
- (3) Pragmatic strategy suggestions: Targeted advice for cross-cultural communication (e.g., polite expression, register adjustment).
- (4) Cross-cultural scenario simulation: Interactive prompts for applying cultural knowledge to real-world communication.

The platform was accessible via web browser during online tutorials, with screen sharing enabling joint teacher-student use. Instructors could monitor platform usage data (e.g., terms translated, cultural notes viewed) to adjust scaffolding.

A 28-item validated ICC scale was used for quantitative data collection, adapted from *Assessment of Intercultural Competence for Chinese College Students (AIC-CCS)*. The scale uses a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) and measures five core ICC sub-dimensions: Intercultural attitudes; Intercultural knowledge; Skills of interpreting and relating; Skills of discovery and interaction; Critical cultural awareness.

A pilot test with 40 EFL learners confirmed high reliability: Cronbach’s $\alpha = 0.92$ (overall), with sub-dimension α ranging from 0.81–0.88 (internal consistency).

32 online tutorial dialogues (16 experimental, 16 control; 4 focal case study dyads = 16 sessions) were recorded via Zoom/Tencent Meeting with synchronized video/audio/screen capture. Recordings captured: Verbal dialogue (teacher-student turns); AI platform use (clicks, translation pop-ups, screen sharing); Multimodal cues (pauses, emphasis, facial expressions, mouse movement). All recordings were transcribed verbatim following conversation analysis conventions^[23], including overlapping speech, pauses (in seconds), laughter, and on-screen actions (e.g., [*student clicks AI translation for “guanxi”*], [*AI box appears: “interpersonal connections with moral obligation”*])). Transcripts for the focal case studies were enhanced with paralinguistic and visual details for fine-grained IS analysis.

Semi-structured stimulated recall interviews were conducted with the four focal case study dyads (8 learners, 4 instructors) post-intervention. Selected 5–10-minute clips of AI-mediated dialogue (e.g., repair sequences, cross-cultural misunderstanding) were played back, and participants were asked open-ended questions: “*What were you thinking when you used the AI platform here?*” “*How did you interpret the AI’s translation/annotation, and why did you elaborate on it?*” “*What role did the AI tool play in understanding this cross-cultural concept?*” Interviews (30–45 minutes each) were audio-recorded, transcribed verbatim, and used to triangulate qualitative dialogue analysis—providing emic insights into participants’ intentions and interpretations.

3.3. Research procedure

The study was conducted over 12 weeks, with four sequential phases aligned with the mixed-methods design:

- (1) Phase 1: Pre-Test (Week 1)

All 64 learners completed the ICC scale in a unified offline setting to measure baseline ICC levels. No significant differences between experimental and control groups were found ($p > 0.05$ for all sub-dimensions), confirming group homogeneity.

- (2) Phase 2: Intervention (Weeks 2–9)

Both groups received 8-week online intercultural English tutorials (2 sessions/week, 40 minutes/session),

focusing on cross-cultural topics relevant to EFL learning: family values, educational systems, social customs, workplace communication, and cultural stereotypes. Experimental Group used the AI translanguaging platform in real-time for linguistic/cultural support; instructors integrated platform uses into dialogue (e.g., prompting students to translate a cultural term, elaborating on AI annotations); Control Group used traditional online materials (PPT, readings, pre-recorded cultural videos); no AI translanguaging support was provided. Tutorials were standardized for topic, duration, and instructor input to control for confounding variables.

(3) Phase 3: Post-Test and Qualitative Data Collection (Week 10)

All learners completed the same ICC scale for post-intervention ICC measurement; 32 tutorial dialogues (16 experimental, 16 control) were video/audio recorded and transcribed; Stimulated recall interviews were conducted with the four focal case study dyads.

(4) Phase 4: Data Analysis (Weeks 11–12)

Quantitative data were analyzed via SPSS 26.0 for statistical validity; qualitative data were analyzed via NVivo 12 for thematic and sequential IS analysis, with constant comparative analysis linking interactional practices to ICC gains.

4. Results

The results are organized into two core sections, aligned with the mixed-methods design: quantitative results (ICC change and the efficacy of AI translanguaging) and qualitative results (interactional processes of AI-mediated ICC scaffolding and core mechanisms linking AI use to ICC gains). The findings address all three research questions, with qualitative results explaining the micro-processes underlying the quantitative ICC gains.

4.1. Key quantitative findings

(1) Significant group differences in post-test ICC

The experimental group scored significantly higher than the control group in post-test overall ICC ($p < 0.001$) and all sub-dimensions ($p < 0.05$), with the largest difference in critical cultural awareness ($p < 0.001$). This validates the unique contribution of AI translanguaging to ICC development, beyond traditional online pedagogy.

(2) Limited ICC improvement in the control group

The control group showed only a slight significant increase in overall ICC ($p = 0.037$) and intercultural attitudes ($p = 0.043$) with small effect sizes ($d < 0.5$), and no significant improvement in critical cultural awareness ($p = 0.054$). This confirms that traditional online tutorials have limited efficacy for ICC development, particularly for critical reflection.

(3) Significant overall ICC improvement in the experimental group

The experimental group showed a highly significant increase in overall ICC ($p < 0.001$) with a large effect size ($d = 1.28$), indicating that AI translanguaging platforms had a substantial positive effect on ICC development. All five ICC sub-dimensions showed significant gains ($p < 0.001$), with the largest effect sizes for critical cultural awareness ($d = 1.34$), intercultural awareness ($d = 1.21$), and pragmatic flexibility ($d = 1.19$).

In summary, the quantitative results answer Research Question 1: AI translanguaging platforms significantly improve college EFL learners' overall ICC and all sub-dimensions, with the most substantial gains in critical cultural awareness—an essential component of Byram's ICC model and a key pedagogical

goal for intercultural EFL education.

4.2. Key qualitative findings

Qualitative analysis of the 32 tutorial dialogues and stimulated recall interviews identified a two-phase interactional process for AI-mediated cross-cultural misunderstanding repair (answering Research Question 2) and three core scaffolding mechanisms that link AI translanguaging use to measurable ICC gains (answering Research Question 3). The findings are grounded in the SCT-IS framework, with AI translanguaging functioning as a dynamic, interactionally embedded scaffold in the ZPD.

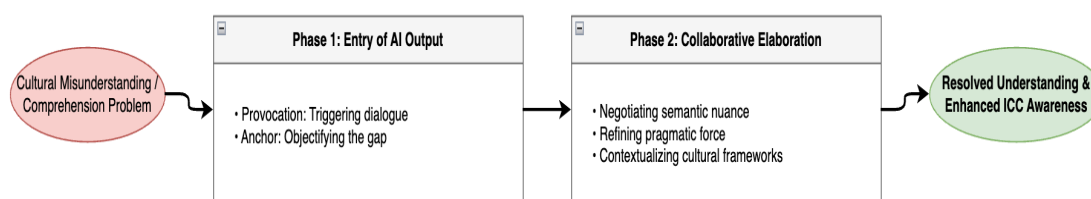


Figure 1. Two-Phase Cross-Cultural Misunderstanding Repair Process.

As shown in **Figure 1**, During phase 1, the AI platform’s output enters dialogue sequentially—after a displayed comprehension problem (e.g., clarification request, pause, word search)—and functions as a provocation (triggering further dialogue) and anchor (objectifying the cultural/lexical gap for joint scrutiny). Stimulated recall interviews confirmed that participants intentionally used AI output as a starting point (not a final answer): *“AI gives me a word, but I need to explain the cultural feeling behind it”* (Student, Case Study 2); *“I use AI to set the stage, then we dig deeper into the cultural context”* (Instructor, Case Study 4). During phase 2, resolution of cross-cultural misunderstanding is achieved by collaborative elaboration where teachers and students negotiate semantic nuance, pragmatic force, and disciplinary/cultural context. This phase is the core of ICC scaffolding. Participants refine the AI’s decontextualized output to fit the specific cross-cultural context of the dialogue. AI translations/annotations often lack pragmatic or cultural subtlety (e.g., positive/negative connotations), and human elaboration addresses this gap. Also, Participants connect the AI’s general output to discipline-specific or personal cultural frameworks, moving beyond surface-level understanding to deep intercultural reflection.

4.3. Three interactional scaffolding mechanisms linking AI use to ICC gains

The analysis of quantitative ICC gains and qualitative interactional processes identified three core scaffolding mechanisms: (1) AI-supported contextualization cue negotiation. (2) Collaborative intercultural meaning-making via translanguaging. (3) Adaptive AI-instructor dual scaffolding.

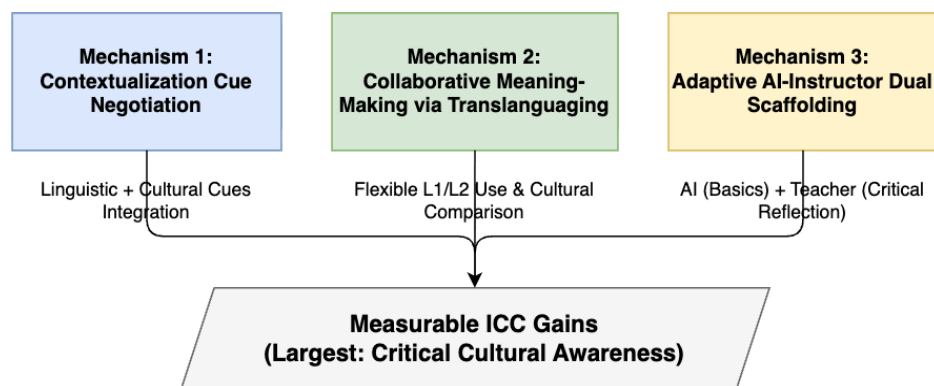


Figure 2. Three Interactional Scaffolding Mechanisms.

As shown in **Figure 2**, the AI platform provides linguistic/cultural cues (translations, annotations) that learners combine with their verbal/paralinguistic cues to communicate complex cultural meaning—fostering intercultural awareness and skills of discovery/interaction. AI translanguaging facilitates holistic translanguaging practice, enabling learners to flexibly switch between L1 (Chinese) and L2 (English) with AI support—breaking down monolingual barriers to meaning-making. This collaborative meaning-making (teacher + student + AI) fosters critical cultural awareness (largest quantitative gain, $d = 1.34$) by encouraging learners to compare L1/L2 cultural concepts (e.g., “*guanxi*” vs. “interpersonal connections,” “*quanwei*” vs. “authority”). This dual scaffolding frees teachers from basic linguistic guidance (e.g., vocabulary translation) to focus on critical cultural reflection—the core of Byram’s ICC model. Instructors confirmed this in interviews: “*AI saves me time on translation, so I can focus on teaching students to think critically about cultural differences*” (Instructor, Case Study 3). Quantitative data show large gains in critical cultural awareness ($d = 1.34$) for the experimental group, directly linked to this mechanism: dual scaffolding enables targeted instruction on critical reflection, a skill rarely addressed in traditional online tutorials (control group).

5. Discussion and conclusion

The quantitative results confirm that AI translanguaging platforms significantly improve college EFL learners’ intercultural competence, consistent with previous research on digital scaffolding in intercultural education. In contrast to conventional language-focused AI tools, the AI translanguaging platform examined in this study functions as a dual scaffold. It offers linguistic support to eliminate communication barriers and provides cultural contextualization to deepen intercultural understanding. This study also extends scaffolding theory by proposing an AI-instructor dual scaffolding model for intercultural learning: AI provides technical, individualized linguistic and cultural scaffolding, while instructors provide interactive, higher-order critical and pragmatic scaffolding. This model effectively addresses the limitations of single scaffolding and maximizes learners’ intercultural development.

However, this study has several limitations: (1) The sample size is relatively small and limited to one university, reducing generalizability; (2) The intervention period is 8 weeks, and long-term effects of AI translanguaging on intercultural competence require longitudinal research; (3) The study focuses on Chinese-English translanguaging, and future research can explore other language pairs.

Future research can: (1) Expand the sample to include multi-university participants; (2) Conduct

longitudinal studies to track long-term intercultural development; (3) Explore AI translanguaging in group intercultural interactions; (4) Integrate multimodal interaction analysis (e.g., non-verbal cues in online videos) into interactional sociolinguistic research.

The study illustrates that AI translanguaging serves not only as a technical tool but also a potent pedagogical mediator that enhances online intercultural language teaching. By incorporating AI translanguaging into teacher-student dialogues, educators can cultivate inclusive, low-anxiety, and high-engagement intercultural learning environments, thereby promoting the global competence essential for success in the digital era. This research provides a replicable mixed-methods framework for interactional sociolinguistic research in education and practical guidance for the digital transformation of college English intercultural teaching.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Wu WP, Chen HY, Lin CC, 2013, Development and Validation of the Assessment of Intercultural Competence for Chinese College Students (AIC-CCS). *Journal of Multilingual and Multicultural Development*, 34(5): 412–425.
- [2] Deardorff DK, 2006, Identification and Assessment of Intercultural Competence as a Student Outcome of Internationalization. *Journal of Studies in International Education*, 10(3): 241–266.
- [3] Pei XZ, Zhang X, Li A, 2025, Intercultural Competence of Chinese Students Abroad: An Investigation Under Sino-Foreign Cooperative Education Programs. *PLOS ONE*, 20(3): e0298765.
- [4] García O, Wei L, 2014, *Translanguaging: Language, Bilingualism and Education*. Palgrave Macmillan.
- [5] Lee S, Lin L, 2025, ChatGPT-Assisted Translanguaging in Online Foreign Language Classes: Pedagogical Implications. *International Journal of Computer-Assisted Language Learning and Teaching*, 15(1): 1–18.
- [6] Seedhouse P, 2022, Transitioning from Conversation Analysis to Mixed Methods in Language Teaching Research. *Language Teaching Research*, 26(1): 3–12.
- [7] Ishihara N, 2025, Criticality and Creativity in L2 Pragmatics: Supporting Linguistic Justice Through Pragmatics Instruction. *JALT Journal*, 47(1): 34–52.
- [8] Tang B, Guo C, Jiang C, et al., 2025, Exploring the Promotion of Intercultural Communicative Competence in TCSOL Through Translanguaging Phenomena. *Communications in Humanities Research*, 12(2): 78–94.
- [9] Zhang Y, Li M, 2024, Challenges and Strategies of Intercultural Education in College English Teaching in China. *Chinese Journal of Applied Linguistics*, 47(1): 78–92.
- [10] Ministry of Education of China, 2020, *College English Teaching Guide*. Higher Education Press.
- [11] David-Izvernar M, Roman A, Bocoş M, et al., 2025, A Comparative Study of Intercultural Competence and Inclusion: Mainstream vs. Multiethnic Schools Using the Intercultural Competence and Inclusion in Education Scale (ICIES). *Journal of Infrastructure, Policy and Development*, 10(2): 56–78.
- [12] Al-Afifi M, Nygren T, Rasmusson M, et al., 2025, Intercultural Competence in the Classroom: A Systematic Review of Classroom-Based Research on Teaching and Learning Practices for Developing Intercultural Competence in Different Educational Contexts. *Intercultural Education*, 37(2): 217–250.
- [13] Ma G, Yang X, 2025, Fostering Intercultural Competence Through AI-Driven Tools: A Case Study of Linguistic and

Cultural Adaptability in Chinese EFL Education. *Digital Technologies Research and Applications*, 7(1): 45–62.

- [14] Fang F, Xu Y, 2024, The Local-International Trend of Intercultural Communication Through World Englishes and Translanguaging. *World Englishes*, 43(2): 312–328.
- [15] Zhang Q, Ismail MIRM, Zakaria A, 2025, Enhancing Intercultural Competence in Technical Higher Education Through AI-Driven Frameworks. *Scientific Reports*, 15(4): 6892.
- [16] Toomaneejinda S, Akaravivattanachai N, 2022, Interactional Sociolinguistics: The Theoretical Framework and Methodological Approach to ELF Interaction Research. *LEARN Journal*, 19(2): 78–95.
- [17] Clouet R, Massot N, 2024, Designing and Implementing an Online Seminar in Telecollaboration. *Machine Translation and Intercultural Communication (MTIC)*, *SKASE Journal of Translation and Interpretation*, 21(3): 47–63.
- [18] Belkahla S, Azmi N, 2025, Using EdTech to Enhance Intercultural Competence as a Transversal Skill in Language Education. *European Journal of Applied Linguistics Studies*, 12(1): 89–106.
- [19] Kremer M, Pinto S, 2025, Exploring the Interconnectedness Between English-Medium Instruction and Intercultural Competence: A Systematic Literature Review. *International Journal of Instruction*, 18(2): 79–98.
- [20] Creswell JW, Clark VLP, 2017, *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications.
- [21] Yin RK, 2018, *Case Study Research and Applications: Design and Methods* (6th ed.). SAGE Publications.
- [22] Apriani L, Putra IW, Sari NK, 2024, AI-Powered Conversational Agents and Intercultural Learning: Insights from Indonesian EFL Students. *Journal of Digital Language Learning*, 6(2): 45–62.
- [23] Jefferson G, 2004, *Transcription Conventions for Conversation Analysis* (Rev. ed.). University of California, Los Angeles.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.