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Fostering intercultural sensitivity in language learning: Quality Talk in telecollaboration

Huey-Jye You, *National Yunlin University of Science and Technology*

*Hui-Chin Yeh**, *National Yunlin University of Science and Technology*

Grace Yue Qi, *Massey University*

Abstract

Telecollaboration has received growing interest in language education as a way of fostering intercultural learning. While the body of literature primarily focuses on the impact of telecollaborative processes on intercultural learning, the effect of supportive mechanisms on intercultural telecollaboration has received little academic attention. This study aims to bridge this gap by examining the impact of the Quality Talk (QT) model—an instructional framework that provides linguistic resources to facilitate constructive discussions—on fostering intercultural sensitivity among language learners in higher education settings. Sixty-five students, including 46 Taiwanese students and 19 New Zealand students, voluntarily participated in the study. We used a mixed-methods approach in the research design to analyze pre- and post-tests on an intercultural sensitivity scale and students' reflective essays. Findings indicate that the QT model-integrated telecollaboration enhanced students' intercultural understanding and sensitivity. It helped learners build confidence and made intercultural telecollaboration more enjoyable. Learners also reported that meaningful conversations with their foreign counterparts deepened their understanding of their own cultures and others' cultures and encouraged reflection on cultural differences, resulting in their appreciation of cultural divides. The potential of the QT model in telecollaboration to facilitate intercultural learning and its implications are discussed.

Keywords: *Intercultural Sensitivity*; *Quality Talk (QT)*; *Telecollaboration*; *Language Learning*

Language(s) Learned in This Study: *English, Chinese*

Introduction

Intercultural sensitivity constitutes a fundamental dimension of global citizenship, integral to fostering meaningful interactions and building bridges between individuals from diverse cultural backgrounds (Rodríguez-Izquierdo, 2021). By cultivating a deep appreciation of varied perspectives and cultural frameworks, this competence empowers individuals to engage with nuanced cultural differences, fostering a sense of respect and empathy across cultural boundaries. Intercultural sensitivity encompasses three developmental aspects: awareness of different languages, recognition of cultural similarities and differences, and the ability to identify diverse cultural expressions in individuals (Pinho, 2014). Equipped with this capability, students are able to engage in intercultural communication, discern and respect cultural distinctions, and appropriately respond to messages during intercultural conversations (Aksin, 2023; Segura-Robles & Parra-González, 2019). In educational contexts, embedding intercultural dialogues within the curriculum cultivates students' awareness of cultural diversity, thereby enabling them to navigate and appreciate cultural complexities (Moradi & Ghabanchi, 2019).

Despite the importance of authentic interactions between diverse cultural groups in enhancing students' intercultural sensitivity (Liu et al., 2023), numerous obstacles persist, particularly by involving language learners. The literature specifically reports that learners have limited linguistic knowledge (Yassin et al., 2020), alongside their unfamiliarity with the way the target language is used in verbal communication (Hsu et al., 2021) and their lack of cultural knowledge (Bardis et al., 2021). These challenges hinder mutual understanding and often result in comprehension difficulties and low-quality interactions (God & Zhang, 2019). To tackle the challenges, language learners are expected to develop intercultural sensitivity through a more structured instructional design that considers both linguistic aspects and learning environments (Zou & Yu, 2019). In this vein, telecollaboration, a pedagogical approach that places emphasis on Internet-based intercultural exchange, has potential to facilitate effective communication between language learners of distinct cultural backgrounds in an institutional context (Godwin-Jones, 2019). Telecollaboration affords a learning environment for language learners to use their linguistic and cultural knowledge (Üzüm et al., 2020; Yeh & Heng, 2022) to collaboratively complete a structured task.

To enhance learners' effectiveness in telecollaborative intercultural communication, structured approaches—such as topic-guided discussions (Ryshina-Pankova, 2018; van der Kroon et al., 2015) and bridging mechanisms like stimulating questions (Lenkaitis et al., 2019; Sardegna & Dugartsyrenova, 2021)—have been shown to foster engagement and mutual understanding. For instance, Ryshina-Pankova (2018) proposed a theme *Patriotism and National Identity* to facilitate information exchange between American and German students. Leveraging topics on daily routines, van der Kroon et al. (2015) engaged both Dutch and Spanish students in sharing individual experiences with eating habits and holiday activities. Moreover, stimulating questions, such as information-seeking questions (Lenkaitis et al., 2019) and brainstorming questions (Sardegna & Dugartsyrenova, 2021), have also enhanced cross-cultural discussions during telecollaboration. While these facilitative means encouraged information seeking and sharing among students, they fell short of promoting meaningful and in-depth encounters. Such exchanges involved more than mere information exchange, encompassing students' efforts to explore contextualized topics, ask critical questions to request further alternative interpretations on issues, and challenge existing knowledge (Çiftçi & Savas, 2018). In-depth conversation requires structured collaborative talks in which appropriate language assistance, such as questions for various purposes, is offered for broader and deeper thinking (Purdy, 2008).

The Quality Talk (QT) model, comprising various discourse elements, has the potential to facilitate in-depth intercultural interactions with language resources to extend dialogues between students (Murphy et al., 2018). However, little research has considered the QT model in telecollaboration, and to our knowledge thus far, there has not been any study exploring the perceived effectiveness of the QT model on language learners' intercultural sensitivity. Our study aims to investigate the potential of the QT model in telecollaboration to develop language learners' intercultural sensitivity and students' perceptions of its effectiveness in fostering their intercultural sensitivity. We propose two research questions which align with the aim:

1. How does the QT model in telecollaboration foster language learners' development of intercultural sensitivity?

2. How do language learners perceive the effectiveness of the QT model in enhancing intercultural sensitivity during telecollaboration?

Literature Review

Intercultural Sensitivity in Foreign Language Contexts

Intercultural sensitivity is broadly conceived as an ability to identify pertinent cultural similarities and differences in intercultural communication (Liu, 2019). It is characterized as understanding, appreciating, and accepting the diversity among cultures (Rissanen et al., 2016). Emphasizing the understanding and appreciation of different cultures, intercultural sensitivity has become an essential element of language

education to empower second or additional language learners (L2) to effectively communicate cross-culturally (Su, 2018). The development of intercultural sensitivity involves complex personal experience through which individuals coordinate meaning across cultural contexts, elaborate on perceptions of interlocutors with a distinct cultural and linguistic background, and accommodate cultural differences (Bennett, 2017). To enhance L2 students' intercultural sensitivity, several studies have integrated various technological tools, such as virtual reality (Li et al., 2020), Google Translate (Shadiev et al., 2019), and interactive online platforms (Gholami Pasand et al., 2021), to facilitate students' critical reflection on cultural variations and engagement in intercultural communication. Among these practices, online intercultural exchange has gained scholarly attention as it pertains to technology-mediated activities that promote constructive interaction between students in geographically dispersed locations (Flowers et al., 2019; Yeh et al., 2024). Telecollaboration, a ubiquitous form of online intercultural exchange over the past two decades (Blyth, 2018), entails virtual communication and collaboration either individually or in groups (Barbosa & Ferreira-Lopes, 2021; Chun, 2015) and holds promise to help students develop intercultural sensitivity. Telecollaboration encourages culturally diverse students to co-construct knowledge and reach mutual understanding through interaction and negotiation (Jao et al., 2024; O'Dowd, 2016). It reflects reciprocity that enables students to deeply reflect on cultural similarities and differences, establish common ground for nuanced discussions, and gain insights into target cultures (Luo & Gao, 2022).

The literature has underscored the significance of constructive intercultural communication in telecollaboration. Various facilitative mechanisms were reported to stimulate meaningful dialogues, such as a designated task (Bueno-Alastuey & Kleban, 2014), leading questions (Eren, 2021), and cultural topics (Toscu & Erten, 2020). For example, Bueno-Alastuey and Kleban (2014) designed three sequenced tasks based on students' virtual presentations, shared respective cultural practices, and verbal reflection on cultural differences. To enrich students' online discussions, Eren (2021) incorporated thematic questions on cultural norms, conflicts, and gender roles. Similarly, Toscu and Erten (2020) provided students with an array of cultural topics to scrutinize different cultural features and exchange opinions. These studies suggest that several catalysts, including organized tasks, stimulating questions, and cultural topics, enabled students to deepen their own cultural understanding and build knowledge of others' cultures. Despite the effectiveness of these mechanisms on students' understanding of diverse cultural practices, they are inadequate to develop students' intercultural sensitivity to better comprehend and receive messages by handling procedural aspects of structuring and maintaining a conversation (Chen & Starosta, 1997). Considering the importance of sustained and meaningful conversations in fostering intercultural sensitivity, the QT model, a dialogic framework that employs diverse questions and talk types, is considered a promising instructional scaffold. This framework includes various questioning techniques and dialogue patterns to elicit multiple ideas and stimulate two-way interaction (Murphy et al., 2018). In Teo's (2019) systematic review of dialogic pedagogy over the past two decades, instructional scaffolding/modeling encouraged students to use specific discourse elements that help them scrutinize what others say, thereby negotiating and building knowledge jointly. By applying the QT model to intercultural communication, students are able to articulate their viewpoints, consider opposing perspectives from others, and initiate further discussion based on these exchanges (Omland et al., 2022). Given the QT model's potential to facilitate sustained and meaningful conversation, this study aims to investigate how the QT model fosters language learners' intercultural sensitivity development and how the learners perceive the effectiveness of the QT model in enhancing their telecollaborative experience.

Meaning Negotiation in Intercultural Communication

Meaning negotiation is a necessary developmental phase in making meaning and facilitates sustained and exploratory communication between language learners. Learners engaging in the interactive process likely receive feedback on their language outputs and refine them based on their interlocutors' responses (Azkarai & Imaz Agirre, 2016). This process provides language learners with comprehensible input, enabling them to adjust problematic language use and resolve ambiguity in their utterances based on the feedback received, thereby achieving mutual understanding (García Mayo & Lázaro Ibarrola, 2015).

The literature has argued that meaning negotiation in intercultural communication engages students in a series of conversational turns to reach shared understanding and mitigate and solve communication breakdowns (van der Zwaard & Bannink, 2014). Various meaning negotiation strategies have been reported in the studies of intercultural communication. For example, Littlewood (2001) reported that the seeking of common ground between individuals from different cultures mitigated any of their encountered communication challenges during intercultural communication. Similarly, Fuchs' (2016) study revealed that students from the U.S. and Türkiye employed various types of negotiation to achieve consensus on a collaborative project. These types included adjusting personal opinions, clarifying collective ideas, and coordinating the project procedures. Focusing on cross-cultural discussions about multicultural and social justice issues, Üzüm et al. (2021) also presented diverse negotiation strategies used by pre-service teachers from the U.S., France, and Türkiye. These strategies included searching for binding elements to address ideological conflicts, reaching agreement on appropriate word choices, and providing necessary information to foster mutual understanding. Findings of these studies are consistent that different modes of meaning negotiation effectively adopted by students can help them optimize their product originality, reach shared understanding, and accomplish their collaboration goal outlined in the task.

While most research has focused on identifying meaning negotiation strategies in intercultural communication, with attempts to understand meaning negotiation processes and outcomes, the integration of supportive mechanisms to facilitate meaning negotiation among learners remains limited. Furthermore, although the literature suggests that meaning negotiation is much associated with intercultural communication, the role of meaning negotiation in supporting students' intercultural sensitivity development as they engage in intercultural exchange activities remains underexplored. Intercultural sensitivity involves the ability to understand and appreciate cultural differences during intercultural communication (Rissanen et al., 2016; Sarwari & Wahab, 2017). Meaning negotiation fosters a mindset that accommodates cultural divides by facilitating the bridging of information gaps. Through this process, students are encouraged to reformulate their utterances by drawing on peer feedback, motivating them to produce more output as a constructive response to interactions (Yuksel & Inan, 2014), thereby promoting mutual understanding. Therefore, this study aims to investigate the effect of the QT model as a potential guide on L2 learners' meaning negotiation with their international partners during telecollaboration.

Method

Participants

This study involved 65 students in total, with 46 learners of English at a university in central Taiwan and 19 learners of Mandarin Chinese at a university in New Zealand. The 46 English learners were at the advanced level based on their scores on the Test of English for International Communication, while their counterparts, 19 New Zealand students, were identified as lower intermediate level Chinese learners based on their performance on the Test of Chinese as a Foreign Language. As soon as human ethical approval was received from both institutions, all the participants were provided with information about the study's purpose and the content, and their consent forms were collected before the research began.

Instructional Design

This study was a 5-week project, aimed at enhancing intercultural sensitivity among 46 English as a Foreign Language (EFL) Taiwanese students and 19 Chinese as a Foreign Language (CFL) students from New Zealand through a QT-facilitated telecollaboration. Table 1 demonstrates the project procedures and tasks over the 5 weeks. The 46 English learners and their 19 Chinese learner counterparts were randomly allocated to form 22 teams in total. Each team then selected communication platforms, finalized a theme they wished to focus on, and located two relevant reading materials. Each team discussion focused on their chosen theme and readings and was guided by the QT model spanning two recorded synchronous

meeting sessions (see Figure 1). With the minimum two meetings, teams may have undertaken additional meetings and/or online interactions based on their own needs. A team-based bilingual digital product was the final requirement for completing this telecollaboration.

Table 1

Overview of the 5-week Project

Week	Procedures
1	46 EFL students form teams with 19 CFL students
	Each team decides on communication platforms
	Each team negotiates a topic and finds two relevant articles
2–4	Students familiarize themselves with the QT model, with their instructors providing necessary support and guidance in the class
	Each team conducts two QT synchronous sessions
	Each team works on creating a bilingual digital story
5	Each team completes a bilingual digital story of 5–7 pages and uploads it to Google Drive

Figure 1

Screenshot of Synchronous Online Discussion on Students' Chosen Topics

This study employed a QT model, adapted from the Description of Discourse Elements developed by Murphy et al. (2018) and the Discourse Elements outlined by Hsu (2021). This QT model (see Appendix A) encompasses two categories of discourse, including seven question types and three response types. Students were required to familiarize themselves with the model prior to their two synchronous meeting sessions and were then encouraged to draw on the linguistic resources in the model to communicate with their foreign counterparts. Their instructors also provided necessary support in understanding and using the QT model for intercultural communication in the class prior to the telecollaboration. The modeled language was also gently adapted by the instructors according to learners' language level, particularly the Chinese version (Appendix B). Learners were asked to prepare QT modeled questions in relation to their chosen theme for their interactive synchronous online sessions. However, learners were allowed and encouraged with flexibility to choose when and how they could apply the QT model in specific contexts.

Data Collection and Analysis

The data collected throughout the project included student responses to a pre-test and a post-test on the intercultural sensitivity scale, focusing only on the 46 Taiwanese students. Additionally, it included recordings of two QT model-mediated meeting sessions and students' reflective essays, involving both Taiwanese and New Zealand students.

Pre- and Post-test on Intercultural Sensitivity for Taiwanese EFL Learners

We adopted Fritz et al.'s (2002) intercultural sensitivity scale to investigate Taiwanese students' developmental intercultural sensitivity during the QT model-facilitated telecollaboration. We decided to focus only on Taiwanese students' intercultural sensitivity in a survey because all 46 students had completed the pre- and post-test as part of their course assessment. Due to a very tight schedule of learning and assessment, New Zealand students were unfortunately not assessed in this regard.

The scale is a 5-point Likert scale ranging from 1 to 5, with 1 marked as *strongly disagree* and 5 as *strongly agree*. The scale contains 24 items divided into five categories: (a) interaction engagement, (b) respect for cultural differences, (c) interaction confidence, (d) interaction enjoyment, and (e) interaction attentiveness. By employing the paired samples *t* test, we analyzed Taiwanese students' pre- and post-test to scrutinize their developmental intercultural sensitivity with the intervention of QT model-facilitated telecollaboration.

Recordings of the QT Model-mediated Meetings

The recordings of two QT model-mediated meeting sessions and students' reflective essays from both sides were collected to examine how the QT model facilitated telecollaboration and enabled students to enhance their intercultural sensitivity. Implementing the QT model was a request for both Taiwanese and New Zealand students to conduct their two QT-facilitated interactive sessions. They were supported by their instructors to maximize use of the QT model to form discourses, particularly in preparing questions regarding their interested theme. Meeting recordings were transcribed, and the data were coded in line with corresponding discourse elements of the QT model (Appendix A). For example, a Taiwanese student initiated a question to ask their New Zealand partner, "What are the cultural differences between Indigenous people in Taiwan and Indonesia?" This question was coded as an authentic question. A typical case sampling approach was chosen to ensure that the findings would be representative of generalizable trends in intercultural sensitivity development facilitated by the QT model within telecollaborative exchanges. This sampling strategy was specifically chosen to capture common interactions and engagement patterns of students in the selected telecollaboration groups, reflecting typical behaviors and responses rather than extreme cases. By focusing on typical cases, we aim to highlight how the QT model may generally influence intercultural sensitivity in language learners, providing a balanced view that can be applied to similar educational settings.

This qualitative analysis involved two phases. In the first phase, the researchers presented identified discourse elements with selected excerpts to interpret how the QT model discussion process helped students develop intercultural sensitivity. Subsequently, to further corroborate the impact of the QT model on students' development of intercultural sensitivity, this study employed the Negotiation Model, conceptualized by Varonis and Gass' (1985) and Doughty's (2000) study and detailed in Palma's (2014) study, to analyze meaning negotiation routines between English and Chinese language learners in each team. The Negotiation Model (Figure 2) consists of four components: a trigger, a signal, a response, and a reaction. A trigger refers to an utterance used by a speaker that results in partial understanding or incomprehension of their interlocutors. This is followed by a signal, emerging as an interlocutors' expression of the comprehension problems in the form of a confirmation check, clarification check, or comprehension check. As expected, the speaker subsequently offers a response to repair the comprehension problems. Based on the response, a reaction can be captured and interpreted as an extension or another response to carry on the negotiation process for continued effective communication.

The Negotiation Model, Adapted From Varonis and Gass' (1985) and Doughty's (2000) Negotiation Model and Palma's (2014) Descriptions of the Model
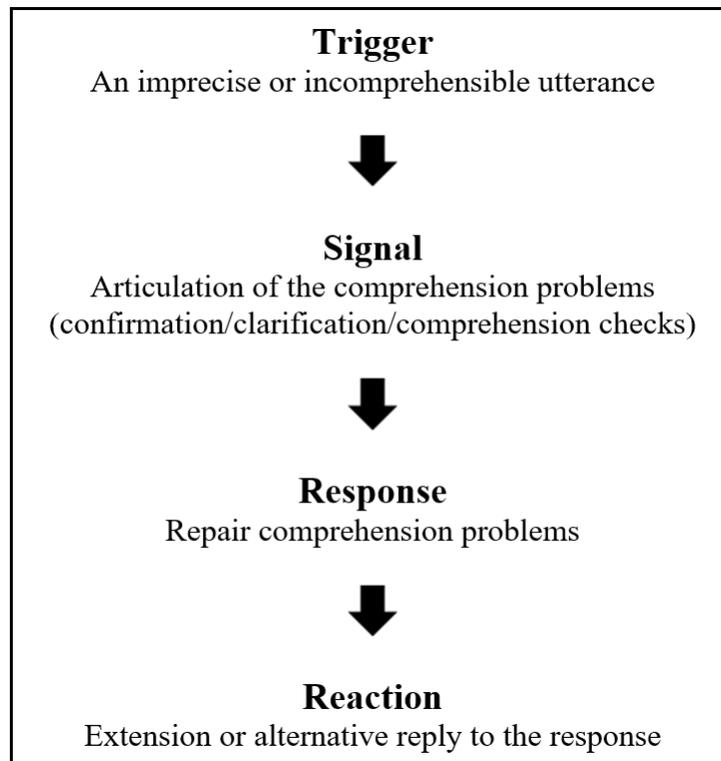
Student Reflective Essays

Student reflective essays focused on their learning experience in the process of telecollaboration, particularly their intercultural development. Students were guided with prompting questions to provide their reflective accounts.

The reflective essays were analyzed based on content analysis delineated by Patton (2002), following sequences of coding, classifying, labeling primary patterns, and interpreting. Students' responses to the guided questions, featuring key phrases such as "understanding cultural differences" and "becoming aware of cultural features," were coded and analyzed to develop themes for further interpretation. The inter-rater reliability reached 0.85.

Results

L2 English Learners Developed Intercultural Sensitivity in Telecollaboration

Comparing and contrasting the Taiwanese students' response to the pre- and post-test, tailoring the intercultural sensitivity in five categories, Table 2 demonstrates the means and standard deviations of each category. The results of the paired sample t test (see Table 3) indicated a significant difference between the pre- and post-test in two categories, interaction confidence ($p = < 0.001$) and interaction enjoyment ($p = 0.003$), while little difference was found in interaction engagement, respect for cultural differences, and interaction attentiveness. These findings suggest that Taiwanese students demonstrated enhanced intercultural sensitivity through increased interaction confidence and enjoyment.

Table 2

Means and Standard Deviations for Each Delivery Variable (N = 46)

Category	Interaction Engagement		Respect for Cultural Differences		Interaction Confidence		Interaction Enjoyment		Interaction Attentiveness	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Mean	3.705	3.745	2.779	2.739	3.061	3.374	2.138	2.384	3.638	3.696
Standard Deviation	0.877	0.912	1.553	1.436	0.996	0.920	0.856	0.954	0.792	0.842

Table 3

The Results of the Paired Sample t Test

Category	t	p
Interaction Engagement	-0.851	0.395
Respect for Cultural Differences	0.656	0.513
Interaction Confidence	-5.165	< 0.001
Interaction Enjoyment	-2.999	0.003
Interaction Attentiveness	-0.783	0.435

The QT Model Facilitated L2 English and Chinese Learners' Synchronous Online Meeting Sessions in Telecollaboration

QT session recordings made by Group 1, 6, 14, and 22 were selected based on typical case sampling to present how students developed intercultural sensitivity by exhibiting increased confidence and enjoyment throughout the QT model-facilitated telecollaboration. Within the selected transcripts, Taiwanese learners of English and New Zealand learners of Mandarin Chinese were denoted as TWS and NZS respectively.

Students Enhanced Intercultural Sensitivity as They Demonstrated Increased Confidence in Interaction

Figure 3 presents members of Group 1 discussing the nuanced political relationship between mainland China and Taiwan. They supplemented their dialogues by contributing alternative perspectives and factual information.

Figure 3

Group 1's Conversation (Extract 1)

Discourse Elements	Conversations	Components of the Negotiation Model
Authentic Question	NZS1: Can you talk about how the Republic of China is related to Taiwan?	Trigger
	TWS7: The question is about the relationship between China and Taiwan, right?	Signal-confirmation check
	NZS1: Exactly.	Response
Cumulative Talk	TWS7: From my point of view, I think we can have a good relationship with people from mainland China, while some folks think that we're from different places and should keep our distance or even be in conflict. If I were in government, on the other hand, I'd have to think about what's best for Taiwan. It's a complex issue. TWS8: I agree with Wendy. It's about setting boundaries. We're neighbors and share a lot of cultural traits. So, if we could cooperate instead of seeing each other as enemies, both sides could benefit, and it could be good for Asia as a whole.	Reaction-elaborated views (extension)

NZS1 initiated the discussion by asking an authentic question that might have been out of curiosity to seek understanding of geopolitical matters between Taiwan and mainland China through the Taiwanese peers' eyes. In response to their question, TWS7 displayed various points by positioning themself to express their own concerns and beliefs and critically drawing on other perspectives by considering how other local Taiwanese and the local government might perceive and respond to the inquiry by indicating, "it is a complex issue," in the end. Furthering TWS7's response, TWS8 acknowledged TWS7's viewpoint and complemented it by further sharing their understanding of existing tension between Taiwan and mainland China. TWS8 envisioned the possibility of future cooperation that would benefit ordinary citizens from both sides. The contributions from TWS7 and TWS8 led to cumulative talk, facilitating joint knowledge construction to produce nuances and insights from their own perspective.

During the conversation, the process of meaning negotiation resolved the comprehension problem and established common ground for further discussion. It was triggered as TWS7 repeated NZS1's question to confirm their comprehension of NZS1's query over the sensitive geopolitical issues. Responding to TWS7's question, NZS1 affirmed their understanding by saying, "Exactly." This affirmation allowed TWS7 and TWS8 to extend the conversation by comfortably sharing their viewpoints on the issue. As TWS7 and TWS8 further elaborated on their viewpoints by carefully expressing different views, they observed or encountered and indirectly added their own perceptions by using the QT model's guided structures, such as "If I were…, I'd…" and "If we could…, xx could…" (Hsu, 2021). This indicates their

development of intercultural sensitivity through elaborating on their perceptions as they engaged with their international partners, who have distinct linguistic and cultural backgrounds compared to them, during telecollaboration (Bennett, 2017). Additionally, students in Group 1 extended their exploration into the relationship among Indigenous communities, local people, and the government (Figure 4).

Figure 4

Group 1's Conversation (Extract 2)

Discourse Elements	Conversations	Components of the Negotiation Model
Personal Experience Question	TWS8: Have you ever met Māori individuals or indigenous people from Taiwan?	
Elaborated Explanation	NZ1: Yes, I've met lots of Māori people. They make up about 20% of our population, so it's different from Taiwan. They live in the cities, not hidden in mountains or remote areas.	
Uptake Question	TWS8: So, you see Māori people often then?	
	NZS1: Yes, that's right.	
Exploratory Talk	TWS8: What about you, Wendy? TWS7: I have. I had an indigenous classmate in elementary school. He was really good at sport, which impressed me a lot. TWS8: Yeah. In my opinion, I think indigenous people are different from us by showing talents in sports, dancing, and singing. They also have an energetic personality trait.	
	NZS1: And in New Zealand, the Māori had this big issue with getting their land back.	Trigger
	TWS8: Sorry, I don't understand.	Signal-clarification seeking
Elaborated Explanation Generalization Question	NZS1: The Māori had this big issue with getting their land back after the British took it. They want some land back and get paid for it. Do indigenous folks in Taiwan have similar issues?	Response Trigger

Cumulative Talk	TWS8: Ah, got it. Well, in Taiwan, when the Japanese were in charge, they took a lot of valuable woods and food from the indigenous people and exploited them.	Reaction–clarification, further querying, and extended clarification (extension)
	NZS1: So, they also had issues with land and resources? Wendy, what do you think?	
	TWS7: Yeah, I agree with what Fanny said. When the Japanese were here, they acted like they were better than the Taiwanese and the indigenous people. It was a tough time; they took a lot and left these communities struggling.	

TWS8 started the conversation by asking a personal experience question to explore NZS1's experience of meeting members of the predominant Indigenous community, Māori, in New Zealand. NZS1 elaborated on the response by explaining that meeting Māori people is possible in everyday life although they are a marginalized population in New Zealand. The discussion on the interaction between Māori and other ethnic communities of New Zealand was expanded to an exploratory talk as TWS8 and TWS7 respectively shared their parallel personal experiences in Taiwan. As an extension, NZS1 subsequently investigated the relationship between British and Māori by raising a territory issue—the land right indicated in the Treaty of Waitangi (the founding document of the Aotearoa New Zealand bicultural and bilingual national agenda). This then triggered a great level of interest in discussion as Taiwanese students learned the conflicts between Indigenous communities and the colonial state in New Zealand, and that also supported their cumulative talk by collectively contributing their understanding of the parallel dispute in Taiwan's history.

During the conversation, the process of meaning negotiation addressed the comprehension concern and facilitated clarification. It was triggered by NZS1's initiation about the land right concern. TWS8 was not aware of and thus highlighted the necessity of clarity seeking with a direct statement, "Sorry, I don't understand." This potential comprehension issue was repaired by having NZS1 offer elaborated explanations.

The conversation within Group 22 (see Figure 5) presents how group members discussed the examination system in Taiwan. NZS2 initiated the conversation by inquiring about national strategies employed to conduct the "Gaokao" (高考)—a term often used to describe the college entrance exam in mainland China—during the pandemic. NZS2 was clearly not aware that Taiwan had a similar concept but referred to it by a different term, while TWS10 sought clarity regarding the context to which NZS2 was referring. Following this re-initiated question, TWS10 then responded and elaborated on how examination systems work in different stages of schooling in Taiwan, drawing on their own experience.

Figure 5

Group 22's Conversation

Discourse Elements	Conversations	Components of the Negotiation Model
Authentic Question	NZS2: How is "Gaokao" happening with the pandemic going on in your country?	Trigger
Elaborated Explanation **Uptake question**	TWS10: Just to clear things up, the "Gaokao" is a Chinese exam, not Taiwanese. So, are you asking about the Taiwanese system or the Chinese one?	Signal-clarification check
	NZS2: Let's talk about the Taiwanese system since it's closer for you. How many big exams do you guys have?	Response-contextualizing and reframing
Elaborated Explanation	TWS10: Well, we have one major test when we go from junior to senior high school. Then there's another big one when we go from senior high to university.	Reaction

Confusion as a result of language barriers was solved at this moment as both students, TWS10 and NZS2, adopted meaning negotiation to identify a shared interest in examination systems to carry on their intercultural meaning making. Although Mandarin Chinese is the national language in mainland China and Taiwan, varied word choices for the same concept and matter, such as "Gaokao" referring to the mainland China context, were fortunately explained to allow further exploration of the topic between the two students.

These extracts demonstrate that the QT model facilitated telecollaboration and enhanced students' interaction confidence. Using various discourse elements from the QT model, students were able to ask questions and explore issues in geopolitics and the educational system, offer elaborate explanations to clarify ideas, and engage in joint discussion to share and co-construct knowledge. Throughout the interaction, meaning negotiations overcame comprehension problems caused by language barriers and knowledge gaps and established common ground for further discussion. These processes suggest that the QT model served as a linguistic scaffold, supporting students in expressing their concerns, engaging in meaningful and constructive conversations, and building confidence. In short, integrating the QT model into the design of telecollaboration or virtual exchange activities potentially equips students with the ability and knowledge of intercultural sensitivity for meaningful intercultural communication (O'Dowd, 2016).

Students Enhanced Intercultural Sensitivity as They Presented a High Degree of Enjoyment in Interaction

Figure 6 describes Group 14's exploration of various greeting manners in their respective countries. In this example, they focused on greeting expressions through the lens of language and culture.

Figure 6

Group 14's Conversation

Discourse Elements	Conversations	Components of the Negotiation Model
Analysis Question	TWS17: The article mentioned there is a Māori tradition called "Hongi" in New Zealand, where people press noses when they greet each other. Is that correct?	
Elaborated Explanation	NZS5: Yes, that's true. It's part of Māori culture. New Zealand has a mix of European and Indigenous Māori cultures. Pressing noses is a Māori greeting.	
Uptake Question	TWS17: Oh, I see. What are the typical greetings in a professional setting? Shake hands or kiss on cheeks?	
Elaborated Explanation	NZS5: Shake hands, definitely. Only kisses with friends or family.	Trigger
Uptake Question	TWS18: In business only shake hands?	Signal-confirmation check
Generalization Question	NZS5: Definitely only shake hands. What do people do in Taiwan?	Response
Elaborated Explanation	TWS17: We just say hello and basically don't have anybody motion. Shaking hands is usually for people in business places or on official occasions. Some people nod their heads to greet each other.	Reaction

TWS17 signaled "Hongi" as a unique greeting manner they have learned from the article they found for this synchronous meeting session. By checking with their New Zealand counterpart if that was the case, TWS17 asked a closed question, "Is that correct?" NZS5 responded to confirm the correct information in the article and TWS17's understanding of the Māori greeting manner. Following this confirmation, NZS5 placed emphasis on the differentiated greeting manners among multicultural communities in New Zealand. NZS5's explanation elicited an in-depth and vivid discussion about greeting manners in New Zealand and Taiwan, as the discussion involved a series of questions followed by explanations for joint knowledge construction.

Confirmation is key to meaning negotiation. This was triggered when TWS18 asked NZS5 for confirmation about handshaking as a typical business greeting manner in New Zealand. NZS5 confirmed TWS18's assumption, which fostered a smooth conversation.

An interesting conversation within Group 6 (Figure 7) shows how group members investigated traditional cooking methods in New Zealand. Their starting point was on the basis of an article they found to support their QT-mediated synchronous meeting.

Figure 7

Group 6's Conversation

Discourse Elements	Conversations	Components of the Negotiation Model
Analysis Question	TWS12: In the article, it mentioned that you use a special cooking method "Hāngī" to cook various items like fish, sweet potato, pork, lamb, potato, pumpkin, cabbage, and more. What kind of food do you usually try to cook?	
	NZS3: All of them.	Trigger
Uptake Question	TWS12: All of them together?	Signal-clarification check
Elaborated Explanation	NZS3: Yes, all of them together. You put all the food in a basket and cook it in the ground. It's like a feast, so there's always plenty of food – chicken, pork, beef, lamb, and lots of seafood.	Response
Uptake Question	TWS12: Why don't people use wood to cook, like they do in barbecues? [laughter]	Reaction
Elaborated Explanation	NZS3: They prefer the flavor that comes from the earth. If you use wood in the ground, it won't cook properly because once the ground is covered, there's no air. The heat from the ground creates steam which cooks the food. That's why we use rocks for geothermal heat, especially in volcanic areas. It's very hot, and there's a lot of steam coming from the earth.	
Speculation Question	TWS12: What if the volcano erupts while you're cooking?	
Elaborated Explanation	NZS3: Well, if that happens, dinner is definitely off! But it's usually very safe. We cook in the place where the volcano is asleep.	

First, TWS12 asked a question to seek identification of "Hāngī," a traditional Māori cooking method in New Zealand. NZS3 responded by explaining the procedures of "Hangi," which encouraged TWS12 to follow up with an uptake question seeking more explanation about the cooking method from a more technical perspective. NZS3 responded by illustrating the rationale for the cooking method and

emphasizing the importance of the volcanic area wherein "Hangi" is performed. In turn, TWS12 raised a speculation question, "What if the volcano erupts while you're cooking?" by putting it in a joking-like manner that created a laugh and presented an alternative perspective toward the discussion of the topic. NZS3 received the message and offered quite a serious answer to satisfy TWS12's curiosity.

The process of meaning negotiation facilitated idea exchange and clarification. It was triggered as TWS12 requested understanding of NZS3's utterance, "All of them." NZS3 acted on and clarified their original utterance by listing various ingredients for a recipe of "Hāngī," that is, an approach NZS3 took to mitigate and fill in the comprehension gap.

In short, these extracts reveal that telecollaboration mediated with the QT model engaged students in stimulating enjoyable, interesting, and meaningful conversations. The utilization of discourse elements facilitated students in extending conversations with various open questions and explanations, sparking their curiosity, and fostering more interaction and smooth conversations overall. Throughout the interaction, meaning negotiations, as exhibited, solved the comprehension problems and clarified different confusing and unclear ideas. These processes suggest that the QT model enabled students to be actively involved in ideas and knowledge exchange, which resulted in a more enriching learning experience.

QT Model-integrated Telecollaboration Enhanced Students' Intercultural Sensitivity

The content analysis of students' reflective essays revealed three themes: (a) deepening understanding of cultural practices in respective nations, (b) critically reflecting on cultural differences, and (c) mitigating bias and appreciating cultural divides. Table 4 shows the instances for each theme.

Table 4

The Prevalent Instances of Themes Reported in Reflective Essays

Themes	Instances
Students deepened understanding of various cultural practices to respective nations	38
Students critically reflected on cultural differences	17
Students mitigated bias and appreciated cultural divides	13

Students Deepened Understanding of Various Cultural Practices to Respective Nations

More than half of instances ($N = 38$) showed that authentic interaction with foreign counterparts deepened students' insights toward different cultural practices in Taiwan and New Zealand respectively. For instance, TWS38 remarked:

> One interesting parallel is in gift-giving customs: in Taiwan, when giving shoes as a gift, it's customary to put a dollar inside, while in New Zealand, a dollar is placed inside a wallet when it's gifted. Additionally, the education system in New Zealand differs significantly from Taiwan's, with a wider age range among classmates and a less conventional approach to college education, including options like gap years and work and travel programs, which are less common in Taiwan. These discussions helped me understand the diversity and unique aspects of each culture.

This illustrates that through genuine communication with foreign partners, students modified presumptions toward particular cultural practices, became aware of multicultural identities manifested within individuals, and compared cultural commonalities and differences (Liu, 2019).

Similarly, TWS6 and TWS28 mentioned, respectively, that through their New Zealand partners, they realized "keeping sheep as pets in a big front yard I thought was common in New Zealander homes is quite unusual" and "not all New Zealanders are originally from New Zealand and my partner knew a lot

of Chinese culture because of her heritage and family relatives." Both students also reflected that interaction with their counterparts was "more authentic and interesting than just Googling information myself" (TWS6) and that there are "diverse cultural backgrounds amongst New Zealanders" (TWS28). Such reflective practices reveal that students developed substantial cultural understanding as they perceived cultures beyond a vague or biased impression, encompassing multifaceted exhibitions of lifestyle features, national cultural diversity, and social customs (Rissanen et al., 2016).

Students Critically Reflected on Cultural Differences

A quarter of instances ($N = 17$) indicated that in-depth intercultural exchange enabled students to critically reflect on their own cultures and cultures of others. TWS6 particularly reflected on their New Zealand partner's insights into the education system that tuition fees were assessed per credit, which made them "appreciate studying in Taiwan more where I am not burdened by heavy tuition fees and do not need to prioritize earning money and delay my education because of it."

Another cultural difference reflected by TWS52 (participant ID number) was environmental actions. They learned from the interaction with their counterparts that "New Zealand typically bring their own reusable tableware, and people are used to using reusable shopping bags." Later, they commented that "New Zealanders are more environmentally aware than Taiwanese as they transform environmental awareness into daily practices rather than just talk about it."

NZS3, as a New Zealander, engaging with their team discussion on Indigenous peoples' rights and their culture's mainstream acceptance in Taiwan and New Zealand, reflected that both states "need to keep reflecting on their legislations and resources distribution in support of their Indigenous peoples, their culture and language revitalization, including New Zealand, although Treaty was widely acknowledged."

These reflective practices provide insightful exploration of topics similarly shown in Toscu and Erten's (2020) study, including education system, environmental issues, and Indigenous community in respective nations, facilitating students in taking alternative perspectives to evaluate advantages and disadvantages of their own cultures and further develop comprehensive perceptions of cultural differences.

Students Mitigated Bias and Appreciated Cultural Divides

Nearly a quarter of instances ($N = 13$) demonstrated that meaningful interaction with foreign partners decreased students' stereotypes and enabled them to appreciate cultural differences. Evident in students' reflective essays, TWS24 noted, "I gained insights from the opportunity offered in interaction with my New Zealand partners and appreciated the notable differences through mutual communication."

Although the Internet afforded an array of information access, TWS11 became more critical about it after telecollaboration: "The information seen on the Internet is not always accurate, and it can differ from the perspectives of local people .... The key to understand a culture lies in having thorough conversations with the locals."

TWS52 realized the power of words by reflecting on discussion around sensitive topics such as politics and religion. They believed "this is the most important aspect of this project – learning to respect and appreciate others' cultures and ideas and learning how to interact and work with people from different cultural backgrounds."

These examples indicate that exchange of different perspectives and ideas enabled students to gain insights to cultural differences, discuss sensitive topics with delicacy, and challenge their bias toward existing knowledge. QT-facilitated telecollaboration allowed for considerations of diverse perspectives on the same topic, fostering students to appreciate cultural divides.

Overall, authentic and insightful intercultural exchange in QT-integrated telecollaboration enhanced students' intercultural sensitivity. Through genuine communication with their counterparts, students had an opportunity to deeply explore their own and others' cultures, critically reflect on cultural diversity, and re-evaluate stereotypes. They gained a better understanding of cultural similarities and differences,

became more reflective and respectful to others, and appreciated more about cultural differences (Rissanen et al., 2016; Sarwari & Wahab, 2017).

Discussion and Conclusion

This study examined language learners' use of the QT model as a guide to facilitate and enhance intercultural sensitivity within telecollaborative exchanges. Additionally, it investigated how the integration of the QT model into telecollaborative settings actively supported the development of intercultural sensitivity among language learners. Findings from pre- and post-test assessments addressing the first research question—how QT model-integrated telecollaboration enhances intercultural sensitivity—indicated a significant improvement in students' intercultural sensitivity, particularly in interaction, confidence, and enjoyment. This positive outcome is attributed to the model's ability to foster sustained, supportive intercultural exchanges, enabling students to explore complex cultural issues and engage in extended, autonomous conversations. These findings reflect Toscu and Erten's (2020) study, emphasizing that telecollaboration facilitated virtual exchange between students from geographically different areas when interpreting and relating culture-specific topics, decreasing their conversation apprehension and increasing their confidence.

The second research question concerned students' perceived effectiveness of the QT model-integrated telecollaboration on their development of intercultural sensitivity. The coded transcripts of the meetings indicated that the QT model enabled students to actively initiate discussions, provide explanations, and synthesize ideas using various discourse elements during conversations. Thanks to the two types of discourse and supporting examples, students were able to use the QT model to engage in meaning negotiation, clarify ideas, and resolve comprehension problems. Our findings resonate with Goh's (2017) claim that appropriate scaffolding strategies effectively assisted students in planning language use for seamless interaction, promoting negotiation of meaning where they received assistance from their interlocutors to identify breakdown in communication, initiating repair of their utterance, and improving their language comprehension (Foster & Ohta, 2005; Loewen & Sato, 2018). Students' reflective essays further revealed that telecollaboration enhanced their intercultural sensitivity. Through authentic intercultural interactions, students expanded their knowledge of various cultural practices, critically reflected on cultural differences, and consequently reduced bias while fostering cultural appreciation (Rissanen et al., 2016; Sarwari & Wahab, 2017). As Lee and Markey (2014) also noted, learning the target culture from L1 speakers' real experience and perspectives, students found it more meaningful as they accessed first-hand experience instead of their own collection of simple facts. Our study revealed that these interactive processes stimulated students' curiosity toward the target culture, encouraged them to express their opinions, and facilitated their identification of cultural differences and respect for each other as alternative perspectives arose (Liaw & Bunn-Le Master, 2010).

However, some limitations of this study warrant attention. First, the 5-week intervention may not fully encapsulate the long-term effects and sustainability of QT model-integrated telecollaboration in fostering a holistic intercultural learning process. Studies that involve longer-term telecollaborations are recommended to assess the feasibility and practicality of such an approach. Moreover, this study was solely carried out within language learning contexts. To broaden its applicability and enhance the external validity of the results, further research in varied settings is needed to improve the generalizability of the findings. Finally, due to the difference in the proportion of Taiwanese students to New Zealand students, data is sourced primarily from Taiwanese students. More equal representation of participants from diverse groups should be considered in future research to provide a more comprehensive understanding of intercultural learning among different cohorts.

Our study highlights the significance of the QT model in telecollaboration for enhancing language learners' intercultural sensitivity. The QT model, with its effective scaffolding of intercultural communication processes, is a promising mechanism in cultivating a deeper sense of cultural understanding and appreciation. This finding is pivotal in the context of our increasingly globalized

world, where intercultural competence is essential. By integrating the QT model into telecollaboration, students are better prepared to become effective and empathetic intercultural mediators, a crucial skill in today's dynamic, globalized world.

Working with instructors in Taiwan and New Zealand to support both sides' learners in understanding and using the QT model for their interactive sessions for this telecollaboration project laid a great foundation for the positive outcome of students' intercultural sensitivity development. To maximize the potential of the QT model in this telecollaboration context, both instructors assisted in gently adapting the modeled language according to their students' language level. This allowed them to tailor instruction to learners' needs, better engage students in the QT model, and provide feedback and support as they prepared for their interactive sessions. These efforts and this involvement in designing the project were essential to this assessment for learning innovation. From the research perspective, this practice-informed exploration also emphasizes the essence of researcher-practitioner collaboration in the field of computer assisted language learning.

This study also adds a unique dimension to the field of language education, highlighting the potential of combining language and intercultural education. QT-mediated telecollaboration has demonstrated its effectiveness as a practical pedagogical approach, enabling language learners to actively engage in linguistic and cultural exchanges. Such a learning opportunity is fundamental to language learners' ongoing intercultural learning and intercultural competence development. Our study offers a compelling call to action for educators, curriculum developers, and policymakers to embrace innovative methods for future generations' language and intercultural development.

Acknowledgements

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Appendix A. Quality Talk Model

Question Types	Descriptions	Examples
Authentic Questions	A question in which the person asked does not know the answer or genuinely wants to know how others will answer	Q: "Why doesn't a neon light always glow as brightly?" R: "The amount of electricity going through it could be different."
Uptake Questions	A question that occurs when a person asks a question about something that someone else previously said	Q_1: "What if Paul Revere failed his mission?" R_1: "That would be really bad. Maybe...the British would take over..." Q_2: "Would he be as popular?" (Uptake) R_2: "No. I think we would be overruled by the British today though. It would not be too bad, like Britain today is not that bad. No one would like, tell us what to do. We just would not be as strong as a country."
Speculation Questions	A question that requires students to consider and/or weigh alternative possibilities	Q: "What if there was no disk in the hot pack? Do you think a different type of energy could start the reaction?" R_1: "Maybe you could use an electric spark." R_2: "Maybe you could throw it really hard against something."
Generalization Questions	A question that helps students synthesize information and develop new viewpoints or construct knowledge	Q: "How much energy goes into creating the loud 'boom' from the explosion?" R: "Well, if you have a bomb made of gas, it has a large fireball. If the bomb is C-4, it has a big shockwave. And the thing about the nuclear ones is that they have all of them. It's a fireball, it's loud, and it has a shockwave."
Analysis Questions	A question that requires students to analyze information for alternative perspectives or identification of various messages	Q: "Do you think his models were pretty close to the real thing?" R: "Yes, because they look like the ones in our museums. We have more research now, and some of the ones in here look like the ones from the research and museums."
Personal Experience Questions / Affective Questions	A question that elicits information about a participant's feelings or their personal experiences in relation to the content they are discussing	Q: "Have you ever seen electrical discharge other than in the video demonstration?" R: "Well last night I was angry because when I was trying to go to bed there were bright flashes of lightning in my window keeping me awake. It got me thinking that maybe what causes us to see the electrical discharge is that those molecules were in an excited state, and therefore released the light."

Test Questions	An inauthentic question that assumes an answer	Q: "What is the definition of nuclear fission?" R: "It's the breaking down of the nucleus."
Response Types	**Descriptions**	**Examples**
Elaborated Explanations	A statement of a claim (e.g., position, opinion, or belief) that is based on at least two independent, conjunctive, or causally connected forms of support (e.g., reasons or evidence)	"I don't really think that would happen [claim] because of the wavelengths [reason1] and just how fast light is going [reason2] that light waves could actually hit each other that often."
Exploratory Talk	An instance or episode of student talk in which students co-construct knowledge together	R_1: "I don't think light bounces off each other because of the wavelengths and the fast speed of light." R_2: "I think it would though, because I thought it said something about how light bounces off and that's what causes us to see color." R_3: "Well, it kind of shows here in the model that the arrows of light would go toward each other, but none of the diagrams in the articles show the light going toward each other. They show the light going toward a particle or something."
Cumulative Talk	Talk in which students provide more information based on others' contribution and jointly construct knowledge	R_1: "I think the neutrons would be released and then go to another atom. They would break that atom up and just keep going." R_2: "Yeah, like in a chain reaction." R_3: "Oh yeah, because if they went to go hit another atom, then it could create an even bigger explosion." R_4: "Exactly. So, with the ping-pong balls, you start with one, and then that splits and you have three separate ones and then those go to other atoms and they split as well – it just keeps going and going."

Note. Adapted from the Description of Discourse Elements developed by Murphy et al. (2018) and Discourse Elements outlined by Hsu H. L. (2021).

Appendix B. Quality Talk Model (Chinese Version)

Potential Question Type	Exemplar in English	Exemplar in Chinese
Overarching	• What do you think…? • Let's talk about… • What is your view of …?	• 你觉得……怎么样？ • 我们来说一说……。 • ……,你有什么意见？
Follow-up, clarify	• Oh, how about …? • Would it be …? • But, how does it…?	• 那你觉得……呢？ • ……是这样吗？ • 可是，……会是什么（情况）？
What-if	• What if there is nothing like this…?	• 如果没有这样的情况呢……？
Extended to other contexts or related issues	• How would you describe this in … context? • Would you think that the similar issues (differences) are existing in … context?	• 在……，你怎么看？ • 你觉得在……是一样（不一样）的吗？
Analytical	• Here is my understanding of … in the texts. Do you think …?	• 这是我对文章中…的理解。你觉得…？
Relate to your own experience; affective	• In my experience/I have some related experience, for instance…, Have you ever had…? • How do you feel…?	• 我有一些经历，比如……。你们有过……? • 你有什么感受？
Knowledge testing/checking understanding	• What is…? What was…? • I don't understand…, what do you think? • I think it is…. Are we on the same page?	• 这个……是什么意思？ • ……我不懂(不明白)。你觉得呢？ • 我觉得这个是……。我们想得一样吗？
Elaborated (evidence-based)	• I would think…because…and I would not think… because…	• 我觉得……因为……。我不觉得……因为……。
Explorative	• Does … remind you of…? • I agree with you, particularly… • I disagree. I think …	• ……让你想起……了吗？ • 我同意你的看法，特别是……。 • 我不同意。我觉得……。
Collaborative/cumulative	• I echo …'s view of…, which was… • Exactly/Yes…	• 我同意……的意见，他（她）说……。 • 对，我赞成……。

Note. Adapted and created by the instructor in NZ.

About the Authors

Huey-Jye You is a researcher at National Yunlin University of Science and Technology in Taiwan. Her research interests include computer-assisted language learning, intercultural learning, and cognitive analysis.

E-mail: vicky4229@gmail.com

ORCiD: https://orcid.org/0009-0006-5320-1844

Hui-Chin Yeh, Distinguished Professor in the Department of Applied Foreign Languages and Editor-in-Chief of Educational Technology & Society, is acknowledged in the Scopus database as one of the World's Top 2% Scientists. Her research interests center on EFL teacher education, AI-assisted language learning, and multiliteracies. Hui-Chin Yeh is the corresponding author.

E-mail: hyeh@yuntech.edu.tw

ORCiD: https://orcid.org/0000-0001-9283-6291

Grace Yue Qi, PhD, FHEA, is a Senior Lecturer and Researcher in the School of Humanities, Media and Creative Communication, Massey University, New Zealand. Her current research interest lies in the epistemological and ontological intersections of language, culture, and technology, emphasizing the humanistic orientation of language education.

E-mail: G.Qi@massey.ac.nz

ORCiD: https://orcid.org/0000-0002-5757-4203