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Virtual exchanges in higher education: Advancing intercultural competence and language confidence



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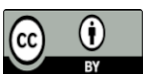
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Abstract

This study, conducted at a mid-sized public university in Thailand, investigates the educational value of virtual exchanges (VE) in enhancing students' intercultural awareness, language confidence, and relationship-building skills in higher education. Quantitative data from Intercultural Development Inventory (IDI) scores and qualitative thematic analysis of participant reflections reveal significant growth in intercultural competence following VE participation. Students enhanced cross-cultural acumen, facilitated spontaneous usage of languages, and established substantial cross-cultural relationships. Technical and communication difficulties commonly experienced by students, including time zone coordination and internet availability, were addressed through adaptive methods. The results support the educational value of VE and highlight the imperative of inclusive and accessible programme designs that are also mutually involving, situating virtual exchanges as central vehicles of internationalisation at a distance (IaD) and global citizenship education.



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Introduction

With globalisation continuing to redefine education, the capacity for communication across cultures has turned into a basic ability for learners all over the world. Historically, intercultural education was sought through physical mobility initiatives like the study abroad programme; these opportunities are accessible to just a fraction of the learners (de Wit & Jones, 2018). Due to cost, environmental, and logistics concerns, VEs have started to emerge as a powerful alternative solution by means of planned on-line collaboration that makes intercultural conversation feasible without geographical mobility (O'Dowd, 2018; Jager et al., 2019). VE initiatives that incorporate digital tools into teaching curricula under the guidance of educators enable learners to build intercultural consciousness, linguistic self-confidence, and collaborative skills. Telecollaboration, e-tandem learning, and transnational exchange are just a few of the various models of VE that reflect the diversity of practice, each influenced by changing perspectives of the intersection of language, culture, and identity within digitally mediated settings (Belz, 2003; O'Rourke, 2007; O'Dowd, 2019). Institutional initiatives like the Erasmus+ Virtual Exchange and the Stevens Initiative have institutionalised VE as a strategic part of international education (European Commission, 2018; SUNY COIL, n.d.).

Despite significant evidence of the advantages of VE for the development of intercultural proficiency, there are challenges. Technological heterogeneity, logistical intricacies, and the potential for the reinforcement of dominant cultural ideologies call for rigorous, inclusive designing and facilitating (Helm, 2016; Fermín-González, 2019). The role of VE in the development of language proficiency and intercultural knowledge has been established by previous studies, but additional empirical investigations are required to understand the subtle ways students overcome cultural and communicative challenges. The goal of this work is to enrich existing scholarship by examining the ways that virtual exchanges advance students' intercultural competency, confidence in the target language, and relationship development, as well as the technical and communicative difficulties they face. Combining quantitative assessment of the development of intercultural competence with qualitative evidence from participants' reflections provides a thoroughly integrated view of the changing landscape of VE in higher education.

Literature review

Virtual exchanges and the development of intercultural competence

VE involves the participation of learners in structured online intercultural collaboration as part of educational courses under the guidance of educators or facilitators (Jager et al., 2019; O'Dowd, 2018; O'Dowd & Lewis, 2016). For second language (L2) education, various models of VE have appeared, including telecollaboration (Belz, 2003; Warschauer, 1996) and e-tandem learning (O'Rourke, 2007).

The growing concerns regarding the costs and difficulties of physical mobility (Richardson, 2016; White & Lee, 2020) have also spurred higher education institutions themselves towards sustainable avenues such as VE (de Wit, 2016). The Erasmus+ Virtual Exchange programme in Europe and the Stevens Initiative programme in the United States have formalised VE (European Commission, 2018; SUNY COIL, n.d.). Moreover, there is growing use of commercial platforms offering 'ready-made' VE experiences, though research is lacking on their effectiveness in developing linguistic and intercultural competences (Trego, 2021). Traditional class-to-class VE models are widely studied; however, generalisations remain challenging due to heterogeneity in tasks, technologies, and evaluation methods. Replication studies, such as the Erasmus+ EVALUATE project (EVALUATE Group, 2019) and Nicolaou's (2019) iterative VE cycles, provide more reliable evidence of VE's consistent educational benefits.

In a qualitative study of 345 portfolios from Spanish EFL students, two types of VE models were identified: bilingual-bicultural telecollaboration and transnational telecollaboration using English as a lingua franca. Bilingual-bicultural exchanges involved culturally comparative tasks in both English and Spanish, while transnational exchanges incorporated collaborative projects focused on global issues (O'Dowd, 2019). Most VE reports in L2 education focus on bilingual-bicultural exchanges (Çiftçi & Savaş, 2018; Lewis & O'Dowd, 2016), generally adopting either the e-tandem or telecollaborative model. In the e-tandem model, students act as informal tutors providing linguistic feedback while communicating in both languages (Brammerts, 1996; O'Rourke, 2007; Menard-Warwick, Heredia-Herrera, & Palmer, 2013; Vinagre & Muñoz, 2011; Ware & O'Dowd, 2008; Leone & Telles, 2016).

Conversely, telecollaboration integrates language practice with intercultural learning, using tasks like cultural comparisons, text-based discussions, parallel texts (Belz, 2005), and the Cultura model (Furstenberg, Levet, English, & Maillet, 2001; O'Dowd, 2005; Orsini-Jones, Lloyd, Bescond, Lee, & Boylan, 2017). Studies such as Ryshina-Pankova (2018), Mullen and Bortuluzi (2019), Schenker (2012), and Zeiss and Isabelli-García (2005) showcase discussion-driven exchanges. The Cultura model enables learners to juxtapose cultural artefacts to foster nuanced cultural understanding (Furstenberg et al., 2001; Chun, 2015). Helm's (2017) sample of 210 European university language teachers reported that the most prevalent tasks involving VE tasks were cultural discussions (76%), cultural comparisons (67%), and personal presentations (65%).

Interest is growing in lingua franca VE methods where learners work together through a common non-native tongue, most typically English (Kohn & Hoffstaedter, 2017; O'Dowd et al., 2019). Such work departs from national cultural comparison towards a wider intercultural communication that represents the globalised complexity of identity (Goodwin-Jones, 2019; Kern, 2014). The transnational VE model (O'Dowd, 2019) illustrates this transformation, centring on worldwide themes and collective ventures rather than country-oriented cultural differences (Menard-Warwick et al., 2013; Risager, 2007). The potential of this model was illustrated by Porto (2018) within

Argentinean and Danish primary students' ecological citizenship initiatives. Similarly, Lindner (2016) illustrated how German and Slovene Sociology students successfully interacted within English lingua franca settings as they established emergent virtual team cultures.

Teacher education tends to take on transnational models of VE that facilitate collaborative work among various cultural settings (Müller-Hartmann & Kurek, 2016; O'Dowd et al., 2019; Vinagre, 2017). Yet collaborative tasks are less common due to the logistics and the intricacies of skills required (Helm, 2016; Lamy & Goodfellow, 2010; Goodwin-Jones, 2019). Helm (2016) also brings forward critical approaches towards telecollaboration that challenge native speaker centrality and the neutrality of technology. These challenge social and political inequalities by addressing discussions facilitated within the context of VE. The Soliya programme provides a good example of this where students from the USA and Arab/Muslim states are connected and made to have structured discussions on controversial topics (Helm, 2016). Ultimately, although VC models are generally classified as bilingual-bicultural, transnational, or critical (Helm, 2016, 2017; O'Dowd, 2019), authentic exchanges commonly incorporate aspects of two or more approaches. Examples of hybrid models that combine cultural comparison and collaborative task completion have been provided by Porto (2018, 2014) and by Lindner (2016). O'Dowd and Ware (2009) likewise suggest that telecollaborative exchanges should incorporate presentation, comparison, and collaboration tasks to achieve maximum learning.

Challenges in virtual exchanges: Navigating communication and technical barriers

Historically, universities fostered international connections through geographical mobility, now termed internationalisation abroad (IA). Yet, approximately 99% of students remain non-mobile (de Wit & Jones, 2018), prompting calls for more accessible approaches like internationalisation at home (IaH), which integrates intercultural experiences into domestic curricula (Beelen & Jones, 2015; IAU, 2024). Expanding beyond this binary, IaD has emerged, emphasising online engagement without physical relocation (Mittelmeier et al., 2021; Ramanau, 2016).

Today, 77% of universities globally engage in virtual internationalisation, driven by the financial, regulatory, and environmental limitations of traditional mobility (Altbach & de Wit, 2018; McCowan, 2023; IAU, 2024). Virtual exchange (VE) has thus emerged as a cost-efficient means of international collaboration (Bruhn-Zass, 2022; Whatley et al., 2024), fostering global awareness and intercultural competence among the students (Hackett et al., 2023). VE overcomes the difference between home and away using synchronous and asynchronous technology and closely aligns with the values of IaD (Huang et al., 2024; Mittelmeier et al., 2019). Notwithstanding this potential, VE encounters considerable challenges, especially in countries with weak technology infrastructure and economic means (Guimarães et al., 2019; Latifi et al., 2022). The use of cutting-edge modern tools requires substantial investments of funds and training. In addition, without being properly designed, VE risks reproducing hegemonic cultural values at the expense of inclusive intercultural exchange (Fermín-González, 2019). Broader VE strategies need research that bridges these gaps in multiple

global settings. Conceptually, VE encapsulates formally structured, technology-based, educator-led programmes fostering intercultural awareness among geographically dispersed learners (Satar et al., 2023; Baroni et al., 2019). Drawn from initial telecollaboration models (O'Dowd, 2018), VE initiatives bring synchronous and asynchronous communication tools together and fit within the multimodal educational approaches like Collaborative Online International Learning (COIL) (Lewis & O'Dowd, 2016). Programmes like Erasmus+ have standardised the use of VE for building soft skills and intercultural competencies (European Commission, 2024).

The pandemic of COVID-19 considerably sped up the use of VE, enriching digital pedagogy (O'Dea & Stern, 2022). The implementation of VE continues to be complex and needs coordinated curriculum development, integration of the software, and intentional facilitation of cross-cultural communication (Guidry et al., 2020; Fonseca et al., 2021; Koris & Vuylsteke, 2020; Lewis & O'Dowd, 2016). Grasping VE as a sociospatial and temporal phenomenon of space, place, and time further emphasises its richness (Raghuram et al., 2023; Temple, 2018). Online tools redefine the perceptions of space and place, affecting interactions and the experience of learning (Maor et al., 2016; Swist & Kuswara, 2016). Synchronous and asynchronous tools redefine the interaction patterns, introducing temporal complications to virtual intercultural communication (Mallon et al., 2023). Though virtual spaces provide accessible and adaptable means of global education (Mittelmeier et al., 2021; Breines et al., 2019), they also reveal gaps of equity through unequal access (Steyn & Gunter, 2023). The success of VE initiatives relies extensively on proper planning in terms of time, technological ability, and instruction (Swist & Kuswara, 2016).

VE needs to deliberately develop a sense of place, building community and belonging throughout spaces that are virtual (Baroni et al., 2019). Successful VE programmes have to reconcile technological, cultural, and geospatial challenges while ensuring effective intercultural learning (Yue et al., 2023; Breaden et al., 2023; O'Dowd, 2021). Ecologically, VE shows the increasingly diminished demarcation between physical and virtual places as new means of imagining international learning opportunities (Huang et al., 2024). Since the physical and virtual exchanges sometimes happen at the same time, the practices challenge and broaden traditional interpretations of international educational spaces.

Research question 1:

How do virtual exchanges improve students' intercultural awareness, language confidence, and relationship-building skills?

Research question 2:

What technical and communication challenges arise during virtual exchanges, and how do students manage them?

Methodology

Setting and participants

The context was a mid-sized Thai government-run university that implemented the English-medium curriculum. The participants were 30 undergraduate students enrolled in a credit-bearing elective that integrated the delivery of VE activities as an integral part of its curriculum. Students came from a broad spectrum of academic fields such as business, engineering, and the humanities and were recruited according to their willingness to participate fully throughout the phases of the study. The demographic breakdown was between the ages of 19-24 years, and the gender was roughly equal at 53% female and 47% male. The participants came from 13 countries and thus provided a richness of intercultural exchange. All the participants had a medium or higher level of English proficiency, at the level equivalent of a B2 on the Common European Framework of Reference of Languages. The minimum level of English proficiency was required as a prerequisite for the students' participation and ability to engage meaningfully in synchronous and asynchronous interactions.

Research design

This study used a convergent parallel mixed-methods design mixing quantitative and qualitative methods of investigation towards offering an integrated picture of the questions under investigation. The reason behind this was the potential of the design to allow concurrent collection of the numeric data obtained from IDI scores and text-based data from participant reflections. The use of the two approaches brought the advantage of obtaining quantifiable changes in intercultural competence as recorded by the researcher while at the same time providing the richness of the subjectively lived experience of participants within the context of the virtual exchange (VE) sessions. The method aligns with Creswell and Plano Clark's (2018) suggestion on how complex educational phenomena should be addressed through convergence of multiple datasets.

Virtual exchange programme structure

The VE programme was embedded within a 12-week academic semester and was structured according to the principles of Collaborative Online International Learning (COIL). The programme started with a period of orientation within the first two weeks when students were exposed to the theory of intercultural communication, digital collaboration software, and the unique aims and expectations of the VE project. Throughout this period, the pre-intervention IDI was tested under proctored conditions. During the third week, the students were assigned a partnering international peer through a partnering institution having common curricular objectives.

The exchange activities took place mainly between weeks four and ten. During these weeks, the students participated not just by means of synchronous meetings via platforms like Zoom and Microsoft Teams but also by way of asynchronous collaboration via shared virtual spaces such as Padlet and Google Docs. Activities included the discussion of culturally specific issues such as hellos and goodbyes, educational customs and work culture values. During the final two-week period of the programme, eleven and twelve, students undertook structured reflective tasks designed to consolidate the outcomes of the intercultural learning. Written reflections were taken at the

conclusion of this period and the post-intervention IDI assessment was conducted. Throughout the programme, the exchanges were carefully facilitated by the educators in order to steer the conversation, encourage critical thinking and ensure the equal participation of all the participants.

Data collection instruments

Quantitative measures for the present study were obtained through the use of the IDI Version 3. The IDI is a 50-item instrument that was validated for measuring intercultural competence on a continuum from monocultural towards more intercultural mindsets. All the items were rated on a five-point Likert scale. The IDI had already demonstrated excellent internal consistency by having Cronbach's alpha values reported as more than .80 (Hammer, 2012). The IDI was administered twice: once before the VE programme and then again immediately after the programme, so that any ensuing changes could be ascribable to the intervention. The IDI was filled in under supervised settings over the internet to avoid any distractions and ensure standardised conditions among all the participants.

Qualitative data were collected through participant reflections submitted at the end of the VE programme. Each participant was asked to write a reflective essay of approximately 500 to 700 words, responding to four prompts designed to elicit rich descriptions of their experiences. Prompts included requests to describe a cultural difference they encountered, reflect on their language use during the exchange, comment on their experience of building a relationship with their exchange partner, and discuss any technical or communication challenges faced. Reflections were submitted electronically via the university's learning management system. Students were informed that their reflections would be anonymised and used solely for research purposes.

Ethical considerations

Ethical approval for the study was granted by the university's Research Ethics Committee (Reference: EDU2025-07). Participation was completely voluntary and all participants gave written informed consent having been formally informed of the purposes of the study, the procedures being followed, and the rights of participants, including the right to withdraw at any time without penalty. Confidentiality was protected by the use of anonymised identifier codes for all participant responses. In addition, participants were reassured that the choice to take part or the content of the thoughts they wrote would not affect any of their academic work. Respectful, beneficent, and just ethical standards underpinned all phases of the research process according to the British Educational Research Association (BERA, 2018).

Data analysis procedures

Quantitative analysis of the data was centred on determining changes in intercultural competence as assessed by the IDI. IDI scores on pre- and post-intervention were compared using paired samples t-tests run on SPSS Version 29. The Shapiro-Wilk test was used prior to the t-tests to check the normality of the data. Detection of outliers was verified by visual inspection of the boxplots. The determination of statistically significant differences between pre- and post-intervention scores was

the goal of the analysis. In addition to significance testing, effect sizes were calculated using Cohen's d and Hedges' g , with interpretation based on conventional thresholds for small, medium, and large effects. Correlation analyses between pre- and post-scores were also conducted to assess score consistency.

Qualitative data analysis employed a six-phase thematic analysis process, following the framework proposed by Braun and Clarke (2006). In the first phase, the researcher familiarised themselves thoroughly with the data by reading and rereading all reflections. In the second phase, initial codes were generated inductively to capture relevant features of the data. During the third phase, these codes were collated into potential themes that related to the key constructs under investigation: intercultural awareness, language use, relationship-building, and technical or communication challenges. The fourth phase involved reviewing these themes for internal coherence and alignment with the overall dataset. In the fifth phase, themes were defined, named, and refined to ensure distinctiveness and analytic clarity. The final phase involved producing a detailed report with illustrative extracts that captured the essence of each theme. NVivo 14 software was used to facilitate the management, coding, and organisation of qualitative data throughout the analysis.

Triangulation and validity measures

To enhance the rigour and validity of the study, methodological triangulation was applied by integrating quantitative findings from the IDI with qualitative insights derived from participant reflections. Member checks were utilised wherein participants were provided the ability to view and confirm initial summaries of developing themes to ensure that those experiences were being accurately captured. Peer debriefing was also utilised wherein two outside researchers critiqued the coding and theme development process to prevent researcher bias and enhance credibility. An audit trail of coding decisions, analytic memos, and reflective notes was kept throughout the research, thus ensuring transparency and dependability. These methods cumulatively enhanced the trustworthiness of the results as proposed by Lincoln and Guba (1985).

Results

The outcomes are reported as two facets: the quantitative outcomes of the IDI measures prior to and following the virtual exchange intervention, and the qualitative outcomes obtained from thematic analysis of the participants' reflections.

Quantitative findings

A paired samples t -test was used to determine if participation in virtual exchanges caused statistically significant differences between the IDI scores of students. The pre- and post-intervention scores of 30 participants were used for the analysis.

As shown in Table 2, the mean pre-intervention IDI score was 83.83 ($SD = 4.12$), while the post-intervention score increased to 92.37 ($SD = 3.46$).

Table 1

Themes and interpretations from virtual exchange experiences

Theme	Subthemes	Sample Extract	Interpretation
1. Developing intercultural awareness	- Recognising cultural differences - Challenging stereotypes	“I didn’t realise how different our greetings were... I almost seemed rude without meaning to.”	Participants became more aware of nuanced cultural behaviours and expectations.
2. Enhancing language confidence	- Speaking spontaneously - Learning authentic expressions	“I used slang I’d never learned before... they laughed, but in a good way.”	Real-time peer interaction improved fluency and increased comfort in speaking.
3. Building relationships virtually	- Digital bonding - Emotional connection across cultures	“Even though we were on Zoom, I felt like we became real friends.”	Virtual environments still allowed for meaningful interpersonal connection.
4. Negotiating misunderstandings	- Managing miscommunication - Developing pragmatic skills	“Sometimes we misunderstood jokes, but then we explained and laughed together.”	Participants used clarification and repair strategies to maintain conversation.
5. Transforming perspectives	- Reflecting on cultural assumptions - Becoming more open-minded	“Before, I thought they were strict... but now I understand the context behind it.”	Exchanges encouraged empathy and critical reflection on preconceptions.
6. Technical and logistical challenges	- Time zones - Internet issues	“It was hard to find a time that worked for both of us... sometimes the connection dropped.”	Practical barriers occasionally disrupted the flow and depth of the exchanges.

Table 2

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-IDI Score	83.83	30	4.120	.752
	Post-IDI Score	92.37	30	3.459	.632

Table 3

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Pre-IDI Score & Post-IDI Score	30	.963	.000

Table 3 shows a very high paired samples correlation, $r = .963$, $p < .001$, indicating a strong positive relationship between the two sets of scores.

The paired samples t-test results, presented in Table 4, revealed a statistically significant increase in IDI scores following the intervention, $t(29) = -38.18$, $p < .001$. The mean difference was -8.53 ($SE = .22$), with a 95% confidence interval ranging from -8.99 to -8.08 . This result indicates that students demonstrated significantly higher levels of intercultural competence after participating in the virtual exchange programme. Effect size estimates, detailed in Table 5, further underscore the magnitude of the change. Cohen's d was 1.22 , and Hedges' g was 1.24 , both reflecting a large effect size (Cohen, 1988), suggesting that the intervention had a substantial influence on participants' intercultural development.

Table 4

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Pair 1	Pre-IDI Score - Post-IDI Score	-8.533	1.224	.224	-8.990 -8.076	-38.177	29	.000

Table 5

Paired Samples Effect Sizes

		Standardizer ^a	Point Estimate	95% Confidence Interval	
				Lower	Upper
Pair 1	Pre-IDI Score - Post-IDI Score	Cohen's d	1.224	-6.970	-8.785 -5.147
		Hedges' correction	1.240	-6.880	-8.671 -5.080

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Qualitative findings

Thematic analysis of reflections provided by the participants resulted in six themes that encapsulated the experience and intensity of the virtual exchanges. As outlined in Table 1, the students on the virtual exchange programme saw considerable development of intercultural awareness as they came across and considered new cultural expectancies. Numerous students expressed surprise and humility upon noticing variation in taken-for-granted habits of daily routines such as conventionally marked greetings and realised that they were more attentive about their own cultural assumptions. Through confronting implicit stereotypes and modes of communication, learners gained self-awareness and a readiness to revise their own behaviour. Developing relationships on multiple platforms was also a significant factor, as students established emotional connections genuinely beyond physical proximity and sometimes revealed a true friendship through sustained exchange. Language confidence was also a significant payoff that was improved particularly for spontaneous speech and idiomatic expression. Casual conversation among peers provided opportunities for authentic language practice within a relaxed atmosphere, improving fluency as well as a sense of security. Humorous or constructive misunderstandings also supported the pragmatic abilities of the students as they worked together to negotiate meaning. Participants also reported a shift away from stereotype towards deeper cultural empathies. Technical glitches like coordination of time zones and instability of the internet sometimes interfered with the smooth progress, but the experience overall showed the effectiveness of virtual exchanges at developing linguistic competence, intercultural awareness, and critical thinking.

Discussion

Advancing intercultural development through virtual exchange

The findings of this study reinforce previous work confirming the educational benefits of virtual exchanges (VEs) as a means of developing students' intercultural competence, linguistic self-confidence, and interpersonal relationship skills. The observed improvement of participants' IDI scores indicates that formally designed online intercultural interactions have the capacity to deeply influence students' perceptions, attitudes, and communication practices. These results complement the outcomes of previous work such as the Erasmus+ EVALUATE study (Baroni et al., 2019) and the iterative VE models of Nicolaou's (2019), where the former showed that thoughtfully designed exchanges always yield quantifiable intercultural development.

The qualitative results demonstrate that exposure to different cultures' behaviours like different ways of greeting, humour, and conversation etiquette was most significant in subverting prevailing stereotypes and increasing the cultural self-awareness of the students. This supports Helm's (2017)

contention that the most effective VE tasks are comparative discussions and reflective tasks that challenge learners to reassess their own beliefs. The participants of this research reported a shift towards viewing the cultures differently from before, changing from simple or stereotypical perceptions towards more complex understandings, confirming Byram's (2008) model of intercultural citizenship education that places prominence on empathy, reflective scepticism, and perspective-taking. Furthermore, the participants' increased comfort with spontaneous speech and use of native-like language, such as colloquialisms and slang, aligns with results of the telecollaborative and the e-tandem models introduced by Lewis and O'Dowd (2016) and Vinagre and Muñoz (2011). Free-flowing interpersonal interactions facilitated by the SPEAK takeout allowed participants to rehearse and develop pragmatic competencies that are hard to impart within traditional classroom settings. Improvements were not just linguistic; they reached as far as intercultural pragmatics because learners were able to handle moments of communicative misunderstanding patiently and humorously, a development that echoes the negotiation of meaning highlighted among studies by Ware and O'Dowd (2008). Relationship-building was another key finding. Students reported establishing strong emotional relationships despite the lack of face-to-face interaction. The finding supports Goodwin-Jones's (2019) contention that virtual spaces permit authentic relationships where physical proximity is not required for effective cross-cultural interaction. Students' reflections indicated that emotional ties formed as a result of shared humour, working on tasks together, and consistent communication—similar factors that have been cited by Porto (2018) within her ecological citizenship initiatives. The use of a lingua franca, primarily English, also influenced the dynamics of interaction. According to O'Dowd, Sauro, and Spector-Cohen (2019), lingua franca conversation facilitates the co-construction of meaning by speakers from a variety of linguistic and cultural backgrounds as opposed to a singular 'native speaker' norm. Students meaning-negotiated together, giving credence to Kern's (2014) view that culture, identity, and language are dynamic and enmeshed within the globalised virtual environment. Of interest was the fact that a number of participants felt empowered by the ability they had to engage meaningfully with peers from around the world using English, underpinning the view that VEs have the potential to eliminate native speaker bias and promote fairer communication conditions (Kohn & Hoffstaedter, 2017). Additionally, the increased open-mindedness and empathy of the participants are consistent with the goals of the critical approaches to telecollaboration theorised by Helm (2016), such that exchanges on the net are intended to meet larger social and political imbalances as opposed to merely creating shallow cultural encounters. While this work did not expressly involve critical pedagogy, the qualitative responses revealed that participants undertook reflective activity consistent with critical intercultural awareness, acknowledging their own cultural prejudices and constructing a more worldly state of mind. The pronounced impact evident within the quantitative results (Cohen's $d = 1.22$) indicates that virtual exchanges are not supplementary or niche activities, but significant educational interventions that have the potential to be a key means of developing students' intercultural competence. This underlines the calls of academics like de Wit (2016) and

Beelen and Jones (2015) for incorporating internationalisation at home (IaH) initiatives within the mainstream curriculum so that all students—not just the small cohort who go abroad—are provided with opportunities for effective intercultural learning.

Addressing communication and technical challenges for sustainable virtual exchanges

Though the results point towards the significant advantages of virtual exchange, they also reveal significant challenges that should be met to make such schemes inclusive and viable. Students experienced logistics challenges, especially time zone coordination and internet connectivity. These challenges are aligned with the challenges identified by Guimarães et al. (2019) and Latifi et al. (2022), where they acknowledge that technology gaps may restrict the access and fairness of virtual internationalisation initiatives.

Time zone differences made scheduling meetings inconvenient for students at times resulting in hasty or infrequent interactions. This corroborates Yue et al., (2023) contention that temporal aspects have a profound impact on the quality and level of intercultural communication within virtual contexts. Having flexible scheduling features, asynchronous elements, and institutional backing during the coordination of tasks is the key to transcending such challenges. Reliability on the internet was another nagging problem, especially as technical breakdowns cut off conversations or created misunderstandings. As noted by Breines, Raghuram, and Gunter (2019), digital infrastructures are distributed unevenly across the world, and thus even the most carefully constructed virtual exchange schemes may end up inadvertently replicating the world's inequalities unless issues of access to technology are actively addressed. To counter these impacts, institutions should make sure that students are provided with consistent means of accessing the internet and provide technical training and assistance where necessary. Another challenge of concern as reflected in the literature is the possibility of reinforcing prevailing cultural views if VEs are not carefully constructed (Fermín-González, 2019). While this study's participants overall enjoyed positive intercultural interactions, there were a limited number of instances of misunderstanding or perceived cultural insensitiveness reported. These were then typically addressed by means of open discussion and negotiation, the type of adaptive intercultural practice encouraged by telecollaborative initiatives (Belz, 2005; Schenker, 2012). However, the potential for cultural hegemony underscores the need for designing VEs that facilitate two-way learning and respect. Programmes should go beyond the exchange of information simpliciter towards fostering profound discussion, challenge questioning, and co-creation of knowledge as promoted by Furstenberg et al. (2001) and Helm (2016). Facilitators have the key role of mediating such discussions by ensuring that the learners recognise and challenge implicit biases as well as power dynamics. Additionally, the results imply that virtual exchanges need to be designed deliberately as part of the academic curriculum and not as something optional or extracurricular. As noted by Lewis and O'Dowd (2016), effective virtual exchange depends on careful curriculum planning, student and staff preparation, and coordination of intercultural outcomes with the educational mission. The participants of this investigation gained from systematic pre-exchange orientations and reflective follow-up tasks that should be made a mainstream part of VE programme

execution. The pandemic of COVID-19 sped up the embrace of digital education across the world (O'Dea & Stern, 2022), revealing that virtual teaching will not be a short-term fix but a permanent reality of the future of higher education. Yet according to Mittelmeier et al. (2021), a complete transformation of institutional policy, the establishment of effective technical infrastructures, and investment in the professional development of educators are needed for genuinely inclusive IaD.

Space, time, and place should also be reconsidered within virtual spaces (Raghuram et al., 2023; Temple, 2018). Students' capacity to constitute a sense of community and belonging within virtual spaces hinges as much on the technology as on the instructional practices that develop trust, empathy, and collective meaning-making (Swist & Kuswara, 2016; Mallon et al., 2023). Students in this research explained how casual talk, humour, and group work contributed towards making the virtual space a 'place' of authentic human connectivity, positively supporting the contention that enriching placemaking exists even within digital spaces. In the future, institutions should also promote such hybrid models combining physical mobility and virtual interaction. Physical exchanges in conjunction with virtual interactions involving students from other nations will offer rich, multi-dimensional intercultural exposure (Huang et al., 2024). Such hybrid models have the ability to dismantle binaries like 'home' and 'abroad', as well as 'local' and 'global', and provide more dynamic, accessible, and inclusive models of international education.

Conclusion

This research supports the fact that virtual exchange (VE) is a significant means of enhancing students' intercultural competence, linguistic confidence, and interpersonal relationship-building skills at the level of higher education. The dramatic gain by the participants in IDI scores, supplemented by rich qualitative evidence, indicates that carefully designed online intercultural interactions have the potential to provide transformative learning opportunities even over physical and cultural distances. These results confirm the earlier studies that pointed towards the consistent educational gains brought about by VE models emphasising substantive conversations, collaboration, and reflective thinking (Baroni et al., 2019; Helm, 2017; O'Dowd, 2019). Concurrently, this study also recognises the continuing technical and logistics challenges that can undermine the success and accessibility of VE initiatives. Problems like the lack of stability of the internet, time zones, and unequal access to digital tools need actively to be addressed for virtual exchange to realise its potential as an equal form of internationalisation at a distance (Guimarães et al., 2019; Latifi et al., 2022). Critical thought also needs to be invested in designing VE courses that avoid reproducing dominant cultural scripts and enable two-way, respectful intercultural exchange (Fermín-González, 2019). Ultimately, the results show that virtual exchanges cannot be regarded as a secondary substitute for mobility, but rather as integrated, evolutionary international pathways of education. Institutional commitment and careful planning, supplemented by pedagogical creativity, can ensure that the accessibility of intercultural opportunities grows through VE, preparing students for effective and engaged participation within a more integrated world.

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Conflict of interest

The author declares no conflicts of interest related to the research, authorship, or publication of this study.

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