



Exploring English pre-service teachers' perspectives on integrating virtual reality with a deep learning approach in an intercultural communication course.

Ainin Nur Fadillah¹, Ratna Andhika Mahaputri², Siti Aisyah³

¹ Department of English Education, Swadaya Gunung Jati University

^{2,3} Professor in Linguistic, Swadaya Gunung Jati University

Article Info	Abstract
Received: 2026-04-07 Revised: 2026-05-19 Accepted: 2026-09-23 Keywords: Deep Learning; English Pre-service Teachers; Intercultural Awareness; Intercultural Communication; Virtual Reality DOI: 10.24256/ideas.v14i2.11830 Corresponding Author: Ainin Nur Fadillah aininnurf@gmail.com Department of English Education, Swadaya Gunung Jati University	<i>This study explores how virtual reality (VR), when combined with a deep learning approach, supports the development of intercultural awareness among prospective English teacher (EPT) students in an Intercultural Communication course at a private university in West Java. A total of 21 sixth-semester EPT students participated, and their Padlet artifacts, video narratives, and questionnaire responses were analyzed using a qualitative case study design, drawing on (Braun & Clarke, 2023) six-phase thematic analysis combined with Fairclough's Critical Discourse Analysis (Pešić, 2022). Five themes emerged, addressing the two research questions. Two of them revealed something worth noting: VR functions not merely as a classroom aid, but as an immersive space where joyfull, meaningful connection, and full engagement occur simultaneously rather than in sequence. The other three themes point to changes that suggest a shift beyond surface-level perception. Students revised cultural assumptions they had never questioned before, drawing contrastive comparisons between their own culture and the ones they encountered in VR. Their affective responses also felt genuine rather than a collective formality, signaling the development of intercultural sensitivity. Questionnaire data support this: the majority of participants agreed that the VR sessions were enjoyable and sharpened their intercultural awareness. Overall, these findings suggest that VR combined with deep learning is a</i>

viable, and arguably underutilized, approach to building intercultural communicative competence among prospective English teachers.

1. Introduction

Intercultural communication (IC) can arise when two people from different cultural backgrounds try to understand one another not just in terms of language, but also in terms of unseen values and norms until both realize that these differences are crucial to their interaction (Baker, 2024). Situations like this occur frequently. (Sarwari et al., 2024) note that such interactions have become commonplace in both professional and everyday life, especially given the rapid pace of cultural development in society.

The main focus of this discussion is Intercultural Communication Competence (ICC), which refers to an individual's ability to achieve communication goals accurately and effectively when interacting with people from diverse cultural backgrounds (Byram, 2021). ICC comprises many aspects, including affective, cognitive and behavioural dimensions (Naranjo-Toro et al., 2026), nor can it be mastered in a short space of time; it develops through a lengthy process involving repeated direct experience (Deardorff, 2019). To avoid conflating related but distinct constructs, this study employs the following operational distinctions: intercultural awareness refers to the cognitive dimension, namely the ability to recognise and explain cultural differences (Chen & Hu, 2023); Intercultural awareness relates to the affective aspect, namely: emotional openness and a willingness to engage with cultural differences, rather than merely being aware of them; whereas intercultural competence is the manifestation of actual behaviour that enables one to act appropriately and effectively in intercultural interactions, developed through direct experience rather than solely through theoretical instruction (Deardorff, 2019). ICC is used throughout this paper as the umbrella construct integrating these three dimensions; the more specific terms are invoked only when a claim pertains specifically to the cognitive, affective, or behavioral component under discussion.

Despite this theoretical richness, conventional language learning in practice, particularly in Southeast Asia, tends to rely on materials that lack cultural context, leaving students with limited opportunities to experience cultural differences firsthand (Aisyah, 2025). This gap has a significant impact on trainee English teachers, who are ultimately expected to be able to manage intercultural classrooms, specifically with regard to the cognitive dimension of ICC discussed above. (Bennett, 2017) This statement outlines the developmental stages of this dimension as a gradual shift from ethnocentrism to ethnorelativism through ongoing experience and reflection, and this requires time and a genuine approach to truly engage across cultural boundaries not just merely knowing about them.

(Bennett, 2017) describes the process as a gradual movement starting from ethnocentrism, progressing through cumulative exposure and reflection, until reaching a point of ethnorelativism.

It is this gap that has led the field of Intercultural Communication, over the past two decades, to begin promoting the use of digital tools in language learning. (Sehlaoui & Zaid, 2025) demonstrated the contribution of Computer-Assisted Language Learning (CALL) to intercultural competence by providing learners meaningful opportunities to form interpersonal connections and learning communities. Whilst previous-generation CALL tools relied heavily on text-based interaction, the latest generation of CALL applications increasingly incorporate a wide range of multimedia, audiovisual and simulation-based features. VR extends the scope of this trend by providing an immersive and practical learning environment. Neither traditional nor multimedia-based CALL tools have yet been able to replicate this in terms of the level of sensory engagement or in providing users with a realistic experience. Through cross-cultural simulations, VR enables learners to develop deeper understanding, enhance empathy, and build more adaptive communication skills particularly valuable where direct real-world exposure is limited (Adelana et al., 2023).

However, immersion alone does not automatically guarantee meaningful learning outcomes. To maximize VR's potential in intercultural education, its integration with a deep learning approach is considered essential. Deep learning, in this context, refers to a strategy that fosters higher-order thinking, reflection on experience, and the meaningful connection of concepts across contexts including cross-cultural ones. This aligns with (Kolb & Kolb, 2017) experiential learning cycle, which positions concrete experience as the foundation for reflection, abstraction, and active experimentation a sequence well-suited to VR-mediated intercultural encounters (Wibowo et al., 2024). The combination of VR and deep learning is a perfect match. VR provides a space to see things as if they were real life, while deep learning provides a framework for rethinking what is being experienced. For aspiring English teachers, this combination offers a cross-cultural learning experience that goes beyond the surface; it involves a process of reflection that unfolds within its context (Safira & Astuti, 2025).

Most VR research in language learning to date has focused solely on student engagement and their perceptions. What has rarely been explored is how VR can actually be systematically integrated with deep learning approaches, particularly in the context of intercultural communication. This is where this study comes in, seeking to directly examine how VR can be integrated into intercultural communication instruction for prospective English teachers (EPT) at a private university in Indonesia. Two research questions serve as our guide: (1) What are EPT perspectives on integrating VR with a deep learning approach in intercultural communication? and (2) In What ways does VR with a deep learning approach promote EPT intercultural communicative competence(ICC), encompassing its cognitive, affective and behavioral dimension?. By integrating immersive

technology into a deep learning framework, this study aims to contribute to EFL education that goes beyond linguistic competence to support the development of intercultural competence, an increasingly urgent priority in multicultural societies like Indonesia.

2. Material and Method

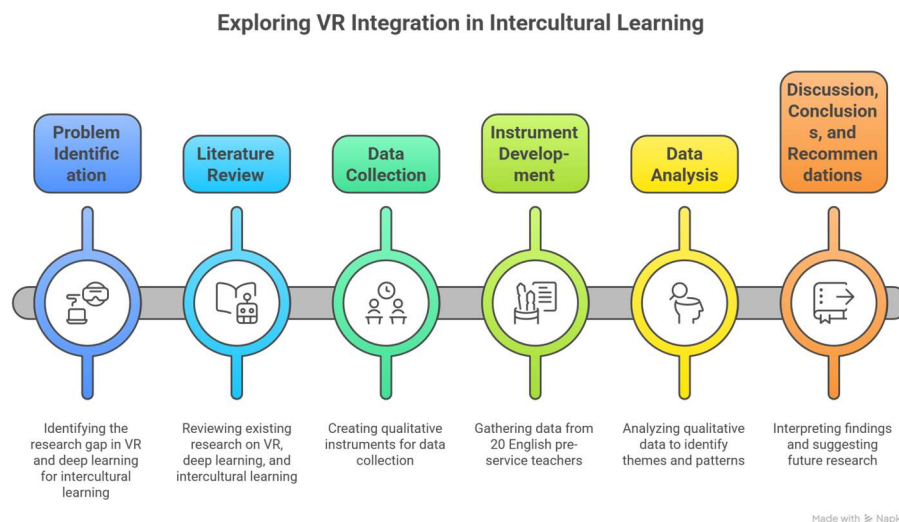
Research Design

A qualitative case study design was chosen for this research. The 12 items were developed through a combination of researcher-constructed items and items adapted from, (Mahaputri, R.A., et al., 2026), covering VR immersion experience, the three deep learning dimensions (joyfull, meaningful, mindful), and intercultural awareness development. The instrument underwent expert judgment validation by one expert in Professor linguistic, who evaluated item relevance, clarity, and content alignment with the research questions prior to administration. Internal consistency reliability was calculated using Cronbach's alpha, yielding a coefficient of $\alpha = 0.736$, indicating acceptable reliability for a supplementary descriptive instrument within this qualitative case study. Statistical analysis alone cannot capture how a person's understanding of another culture might change. Such changes typically emerge through the communication they engage in, the assumptions they revise, and the small moments they choose to reflect on. Therefore, this study takes a closer look at how the use of VR, combined with a deep learning approach, is perceived to shape and support the intercultural awareness of prospective English teacher students at a private university in West Java. The context is quite specific and limited, making the case study method more suitable than a broader survey approach.

The researcher chose a case study design because the phenomenon under investigation, VR-mediated intercultural learning within a specific instructional context, is bounded, situated, and resistant to decontextualized generalization (Miller et al., 2023). Instead of pursuing statistical representativeness, this approach draws on rich, multi-perspective knowledge from diverse data sources. The researcher drew data for this study from three separate but complementary sources to enable methodological triangulation: (1) Padlet artifacts containing multimodal reflections retrieved from a Padlet platform used in an intercultural communication course; (2) video narrative from a student in the same course of questionnaire; and (3) a post-VR Questionnaire administered directly by the researcher to 21 pre-service English teachers in semester six at the same university, who had previously engaged in VR-based intercultural learning activities. This triangulation method, based on three data sources, makes the research findings more reliable and the data collection process more comprehensive. Reflections on Padlet and video narratives can be interconnected with the responses in the questionnaire; if all three point in the same direction and provide the same answers, it is most likely not a coincidence, but rather they are interconnected, making the findings reliable. (Kristiawan and Istiqomah, 2025)

note that this kind of approach is important to ensure the analysis remains focused on a single event namely, VR-based intercultural classroom learning.

Figure 1. Flow Chart



Participants

This study involved English pre-service teachers enrolled in an Intercultural Communication course. The researcher retrieved Padlet artifact reflections from this course as the primary qualitative data source, selecting entries for richness and analytical relevance to the research questions, following the principle of information-rich case selection in qualitative inquiry (Miller et al., 2023). In addition to gathering data from Padlet, three video narratives were also obtained from prospective English teacher students in the same class. These videos were subsequently compiled into a single narrative. In them, the students directly recounted their diverse experiences with intercultural learning using VR. The group consisted of 21 student teachers in their sixth semester of the English Education Program, who were recruited to complete a post-VR questionnaire. They were selected because they had previously participated in VR-based intercultural learning activities in the Intercultural Communication course, so their responses to the questionnaire could be validated based on real-world experience, specifically, intercultural communication learning using VR.

The researcher applied total sampling to this group, including all 21 eligible students (Etikan et al., 2016). The researcher informed all questionnaire participants of the study's purpose, and they gave consent prior to data collection. In this study, to protect the participants' identities, all data references in this report are labeled with pseudonyms for example, "Anonymous 1" assigned by the

researcher, rather than the participants' real names; the raw data files containing identifying information are accessible only to the researcher and are stored separately from the anonymized data excerpts used in the analysis and reporting. Prior to data collection, all 21 participants received a written information sheet (distributed via an online questionnaire) explaining the purpose of the study, the three data sources (work on Padlet, video narratives, and questionnaire responses), and that their participation was voluntary and non-evaluative. Since the same 21 students contributed all three data sources, this written consent covered all three. Participants were also informed verbally in class before filling out the written form that their reflections and narratives would be quoted in a publication. This verbal notification was not documented separately in writing. Institutional approval for this research was granted informally through permission from the course instructor.

Data Collection

The researcher gathered data through three instruments across the three sources described above. First, Padlet artifacts served as the primary qualitative data source. The researcher retrieved structured student reflections on four VR cultural scenes, a Japanese language classroom, an Indian market in Rajasthan, the Shopee Singapore headquarters, and a Western university dining hall, guided by four prompts: observed behaviours, communication style, cultural values, and emotional response. English pre-service teachers also completed four cross-cutting reflection tasks: which culture impressed them most (Reflection 1), similarities and differences with Indonesian culture (Reflection 2), cultural assumptions they became aware of (Reflection 3), and their overall VR experience (Reflection 4). The researcher used the Padlet platform because it supports real-time, multimodal, asynchronous contribution and generates authentic responses in a naturalistic learning environment. The researcher selectively retrieved entries that were analytically rich and directly relevant to the research questions. Second, the researcher collected three individual video narratives, each produced independently by a different pre-service English teacher, in which participants reflected on their VR-mediated intercultural learning experiences across the four cultural scenes. The researcher selected these three participants because their reflections were the most analytically comprehensive, each addressing all four VR scenes and articulating explicit shifts in intercultural awareness, consistent with information-rich case selection in qualitative inquiry (Miller et al., 2023). Third, the researcher administered a post-VR questionnaire of 12 closed items directly to the 21 semester-six participants. Items addressed VR immersion experience, the three deep learning dimensions (joyfull, meaningful, mindful), and intercultural awareness development, aligned with the two research questions. Questionnaire responses corroborated and helped triangulate the thematic findings from the Padlet artifacts and video narrative.

Data Analysis

Data analysis was conducted using two complementary frameworks and applied to all three available data sources. For the Padlet artifacts, the researchers followed the six-stage thematic analysis framework proposed by (Braun & Clarke 2023). This stage began with rereading all of the students' reflections to reacquaint themselves with the data, followed by initial coding, during which several codes emerged, such as "immersive presence," "cultural empathy," and "assumption revision." From these codes, the researchers identified recurring thematic patterns and then reexamined these same patterns across the entire dataset to ensure no oversights occurred. The final stage involved accurately naming and defining each theme before compiling them into a thematic report, which is discussed in the Results section.

(Kristiawan and Istiqomah, 2025) deep learning framework guided this process, structuring the analysis around the dimensions of joyfull, meaningful, and mindful learning. The video narratives were analyzed separately from the Padlet data. They were extracted from the students' spoken words, reviewed, and then transcribed into written form; afterward, they were read and analyzed by the author so they could be incorporated into the same thematic analysis. The reason for this is simple: what students say spontaneously in the videos often includes variations that do not always appear in their reflective writings on Padlet, thereby adding another perspective to their intercultural learning experiences.

Thematic Analysis and CDA were combined rather than applied separately because each framework addresses a different layer of the same data, and together they answer the two research questions more completely than either could alone. Thematic Analysis (Braun & Clarke, 2023) identified recurring patterns of meaning across the Padlet artifacts and video narratives, allowing the researcher to establish what changes in intercultural awareness the EPT students reported. Thematic coding alone, however, tends to describe the content of what participants said without accounting for how that content was linguistically constructed, positioned, or ideologically framed. In this study, Thematic Analysis and CDA were integrated rather than applied separately, because each framework addresses different layers of the same data; furthermore, when used together, they can directly address all the research questions of this study more comprehensively than if they were applied as separate methods. Thematic analysis (Braun & Clarke, 2023) detects and identifies patterns of recurring meanings across the available data Padlet artefacts and video narratives thereby enabling researchers to determine what changes in intercultural awareness were reported by pre-service English teachers. However, thematic coding alone can only describe the content of what the respondents said and wrote, without taking into account how that content was linguistically constructed, or how they reshaped their intercultural communicative awareness through certain rational and analytical choices, in particular how they positioned themselves in relation to 'the other' in cultural

terms and in terms of their ideological assumptions. In other words, thematic analysis addresses and provides the ‘what’ aspect that is, patterns of change at the content level whilst Critical Discourse Analysis (CDA) addresses the ‘how’ and ‘why’ aspects, namely discursive mechanisms. In other words, Thematic Analysis provides an overview of the ‘what’ namely, patterns of change at the content level whilst Critical Discourse Analysis (CDA) provides an insight into the ‘how’ and ‘why’ that is, the discursive mechanisms through which these patterns are linguistically realised; therefore, the combination of these two approaches enables researchers to move beyond a purely descriptive account of these themes towards a more critical interpretation of how intercultural awareness is linguistically constructed something that cannot be captured with the same depth by any single framework alone. The researchers analysed the questionnaire responses descriptively, reporting simple frequencies and percentages of agreement rather than inferential statistics, in line with their status as supplementary descriptive evidence rather than as standalone quantitative measures; these patterns are presented alongside thematic findings to reinforce and enrich, rather than to independently test, the qualitative interpretation (Mahaputri, R.A., et al., 2026)

Table 1. Combined TA-CDA Coding Procedure Across the Five Themes

This table extends the original two-excerpt illustration to cover representative excerpts from each of the five themes (Themes 1, 3, 4, and 5), following the same procedure: an initial TA code, the CDA textual-level feature that linguistically enacts it, and an interpretation grounded in the relevant literature. Replace the sentence "Table 1 illustrates this coding procedure with two representative excerpts" in the Data Analysis section with "Table 1 illustrates this coding procedure with eight representative excerpts spanning the five themes."

Excerpt	TA Code	CDA Feature (Textual Level)	Interpretation
"If this Japanese style were adapted in Indonesia, it could make our learning environment more focused and respectful, but we should still keep our friendly and open attitude." (Anonymous 9, Padlet Japan Classroom)	Selective cultural adoption	Contrastive conjunction ("but"), continuity marker ("still")	Signals selective borrowing rather than wholesale replacement, linguistic marker of critical cultural awareness (Byram, 2021)

"I stopped seeing communication as right or wrong, and started seeing it as different." (Anonymous 7, Video Narrative)	Cognitive reframing	Shift from evaluative binary lexis (right/wrong) to descriptive-pluralist lexis (different)	Marks the transition Byram (2021) identifies as critical cultural awareness
"It was so exciting and truly mind-blowing! ... it still felt like I was being taken on a trip to another country without actually having to go there." (Anonymous 2, Padlet Reflection 4)	Immersive presence / spatial displacement	Hyperbolic evaluative adjectives ("exciting," "mind-blowing"), spatial deixis ("taken on a trip," "without actually having to go there")	Deictic phrasing collapses the distance between virtual and physical travel, positioning the VR encounter as functionally equivalent to being there (Kolb & Kolb, 2017)
The immersive view makes you feel in the classroom rather than watching from the outside." (Anonymous 4, Padlet Reflection 4)	Sensory immersion / insider positioning	Contrastive prepositional pairing ("in the classroom" vs. "from the outside"), embodied-perception verb ("feel")	The in/outside contrast linguistically enacts a shift from spectator to participant footing, consistent with mindful learning as full presence (Kristiawan & Istiqomah, 2025)
"I used to assume that being a few minutes late was acceptable. However, in Singapore's office culture, punctuality and efficiency are highly valued." (Anonymous 8, Padlet Reflection 3)	Assumption correction	Modal past ("used to assume"), contrastive conjunction ("However"), evaluative intensifier ("highly valued")	The temporal marker "used to" frames the prior belief as obsolete, while "However" performs the corrective pivot Deardorff (2019) links to genuine cross-cultural empathy
"In Rajasthan, communication is	Differentiated comparative schema	Parallel syntactic structure across two	Parallelism enacts a differentiated (non-

<i>more expressive and relaxed... Japan emphasizes respect, group harmony, and personal responsibility in learning."</i> (Anonymous 10, Padlet Reflection 2)		clauses, comparative/evaluative adjectives	binary) knowledge structure, evidencing the capacity to hold multiple cultural frameworks distinctly (Byram, 2021)
<i>"I was impressed because this culture showed that communication is not only about words... Even though the market looked chaotic at first, it actually reflected a strong sense of community and warmth."</i> (Anonymous 8, Padlet Reflection 1)	Affective reframing	Concessive clause ("Even though... it actually"), lexical shift from negative ("chaotic") to positive evaluative terms ("community," "warmth")	The concessive structure stages a resolved tension between initial judgment and revised understanding, marking authentic rather than performative intercultural sensitivity (Chen & Hu, 2023)
<i>I no longer expect others to adjust to my way of communicating. Instead, I see intercultural communication as a shared effort to understand each other."</i> (Anonymous 7, Video Narrative)	Behavioral / attitudinal transfer	Negation ("no longer expect"), contrastive adverb ("Instead"), collective framing ("shared effort," "each other")	The shift from an egocentric expectation to a collaborative frame linguistically enacts the outer behavioural layer of intercultural competence (Deardorff, 2019)

3. Result

Thematic analysis was conducted through reflections documented on the Padlet platform and questionnaire responses. The process followed the six-phase method of (Braun & Clarke, 2023), further strengthened by Critical Discourse Analysis drawing on (Pešić, 2023). Through this analytical process, five themes emerged addressing the two research questions. Themes 1 and 2 address RQ1 (EPT perspectives on VR integrated with deep learning). Themes 3, 4, and 5 address RQ2

(the degree to which that integration promotes intercultural awareness).

Table 1 summarizes responses to all 12 post-VR questionnaire items, grouped by the theme each item corresponds to. These quantitative patterns are presented alongside qualitative evidence within each theme in the following subsections.

Table 2.. Summary of Post-VR Questionnaire Responses by Theme

Q. No	Questionnaire Item	Related Theme	Agree + Strongly Agree	Response Breakdown (SA/A/N/D/SD)
1	Using VR made my intercultural communication learning feel more real and immersive	Theme 1	71%	33% SA, 38% A, 29% D 0% SD
2	I was more engaged during VR sessions than in regular classes	Theme 1	76%	24% SA, 52% A, 10% N, 14% D, 0% SD
3	Learning intercultural communication through VR was enjoyable and not burdensome	Theme 2 (Joyfull)	100%	57% SA, 43% A, 0% D, 0% SD
4	The VR experience connected well with my intercultural experiences	Theme 2 (Meaningful)	86%	38% SA, 48% A, 14% N , 0% D, 0% SD
5	During VR sessions, I was fully focused on what I was learning	Theme 2 (Mindful)	86%	38% SA, 48% A, 5% N, 10% D, 0% SD
6	VR increased my knowledge about different cultural practices and communication styles	Theme 4	90%	43% SA, 48% A, 10% N, 0% D, 0% SD
7	VR made me more sensitive toward cultural differences	Theme 3	81%	38% SA, 43% A, 19% D, 0% SD
8	VR improved my ability to communicate with people	Theme 4	90 %	33% SA, 57% A, 5% N, 5% D, 0%

	from different cultures			SD
9	Through VR, I was able to understand different cultures of people from other cultures	Theme 3	90%	52% SA, 38% A, 5% N, 5% D, 0% SD
10	VR encouraged me to reflect on my own cultural values	Theme 3	86%	43% SA, 43% A, 5% N, 10% D, 0% SD
11	Learning directly through VR was more impactful than reading about other cultures	Theme 5	62%	24% SA, 38% A, 14% N, 24% D, 0% SD
12	VR with a Deep Learning approach helped me become more aware of intercultural communication in my daily life	Theme 4	100%	38% SA, 62% A, 0% N, 0% D, 0% SD

EPT Perspective on VR integrated with deep learning VR 360° as an Immersive Space for Intercultural Deep Learning

Theme 1 indicates that EPT participants did not regard VR merely as an instructional tool, but as a learning space distinct from conventional classroom instruction. Both the Padlet reflections and questionnaire responses point in this direction. Questionnaire data show that nearly three-quarters of participants (71%) felt that VR made intercultural learning feel more real and immersive (Q1: 38% agree, 33% strongly agree), and more than three-quarters (76%) reported feeling more engaged during VR sessions than in regular classes (Q2: 52% agree, 24% strongly agree). Figure 2 shows the distribution of responses for these two items.

A recurring pattern in the Padlet reflections is that participants described themselves as present within the scene, rather than watching it from the outside. Anonymous 1 wrote:

"It felt more immersive than just reading or watching a regular video because I could look around and notice small details like people's gestures, body language, and the environment around them. I felt as if I was actually present in each setting, which helped me understand how culture influences daily behavior and communication."

(Anonymous 1, Padlet Reflection 4)

Anonymous 1 positions himself as an active participant in the scene rather than a passive observer, a pattern that recurs in Anonymous 2's reflection:

"It was so exciting and truly mind-blowing! Even though the gadget I used wasn't an iPhone, it still felt like I was being taken on a trip to another country without actually having to go there. I could see the real atmosphere, how people interacted, and even small details like their facial expressions and gestures. All the details made me understand the meaning of culture from a real perspective, not just from textual information!"

(Anonymous 2, Padlet Reflection 4)

The video narrative data show a similar pattern. Anonymous 3 described:

"At first I thought that VR was just something fun and just related to games or entertainment, but after learning it in the intercultural communication class, I realized that VR actually has a deeper role in intercultural communication. In there, we can see how people live, how their environment looks, and how their culture appears. For me, this is interesting because it makes learning culture feel more real. It's not just reading or listening but actually saying and feeling the situation."

(Anonymous 3, Video Narrative)

Across both the Padlet and video data, participants consistently described VR through language of direct presence rather than observation being 'there,' seeing things as 'real,' rather than simply receiving information about a culture. This consistency across two independent data sources suggests that participants experienced VR as an immersive rather than a purely observational medium.

Deep Learning Dimensions of Joyfull, Meaningful, and Mindful Learning through VR

Theme 2 addresses how the three deep learning dimensions joyfull, meaningful, and mindful following (Kristiawan and Istiqomah, 2025), were reflected in participants' VR experience. The data suggest that participants experienced all three dimensions within the same sessions, rather than describing them as separate stages.

For the joyfull dimension, all 21 participants (100%) reported that VR learning was enjoyable and not burdensome (Q3: 57% strongly agree, 43% agree). This is consistent with qualitative reflections describing spontaneous enthusiasm for example, 'Wow, culture is really alive!' (Anonymous 2, Padlet Reflection 4) and Anonymous 1's description of VR as 'more realistic, interactive, and memorable.

For the meaningful dimension, questionnaire data show that 86% of participants felt VR aligned with intercultural experiences they already had (Q4: 48% agree, 38% strongly agree). Anonymous 2, reflecting on encounters across four cultural settings, observed:

"It also made me realize how different environments shape people's

interactions for example, how formality in Japan contrasts with the liveliness of India or the modern openness of Singapore. Overall, VR made learning about culture more realistic, interactive, and memorable."

(Anonymous 2, Padlet Reflection 4)

For the mindful dimension, 86% of participants reported being fully focused during VR sessions (Q5: 48% agree, 38% strongly agree). Anonymous 4 described this focus directly: 'The immersive view makes you feel in the classroom rather than watching from the outside.' Anonymous 5 reported a similar sense of sensory immersion: 'when Anonymous 14 described the strong aroma she smelled, I could almost imagine the distinctive scent of spices and sense the vibrant energy of the bustling market. Anonymous 6, through their video narration, actually captured all three dimensions at once in a single reflection.

"It was more interesting and helped me focus better, showing that learning does not have to be boring or passive. Learning with VR gave me a new and meaningful experience. It made learning more engaging, helped me to see how technology can support education in the future."

(Anonymous 6, Video Narrative)

Figure 3. A participant using the VR headset during an intercultural communication session. This image illustrates the physical setup referenced in participants' reflections describing a sense of presence within the simulated environment (Theme 1).



Anonymous 6's video reflection touches on all three dimensions within a single, unprompted statement 'more interesting and helped me focus better'

relates to joyfull and mindful learning, while 'a new and meaningful experience' relates to meaningful learning. This suggests that, for at least some participants, the three dimensions were not experienced as sequential stages but as co-occurring aspects of the same VR session.

In That Ways to Which VR with a Deep Learning Approach Promotes EPT Intercultural competence

To answer the second RQ, three aspects were focused on from the data analysis. First, cultural empathy – how EPT began placing themselves in a different perspective and feeling more as if they themselves were present within that culture. Second, they also frequently compared Indonesian culture with the target culture as a way to understand the differences. Third, there were honest emotional responses, which serve as evidence that they were genuinely engaged, not merely following existing rules/procedures.

Cultural Empathy and Self-Repositioning through the Perspective of 'the Other'

Theme 3 addresses how participants began to revise cultural assumptions after experiencing them through VR. Questionnaire data show that 90% of participants agreed that VR helped them try to accept the perspectives of people from other cultures (Q9: 52% strongly agree, 38% agree), and 86% felt that VR made them more open-minded about their own cultural values (Q10: 43% strongly agree, 43% agree).

Padlet Reflection 3 asked participants to identify cultural assumptions they became aware of. Anonymous 1 wrote:

"I used to assume people everywhere show respect and friendliness in the same way. After watching the videos, I learned that every culture expresses these values differently. I also assumed that being direct and expressive was always a good way to communicate, but now I understand that in some cultures, indirect and calm communication is seen as more polite. This made me realize that my own habits are shaped by cultural norms, and I need to be more open-minded and sensitive when interacting with people from different backgrounds."

(Anonymous 7 , Padlet Reflection 3)

The recurring 'I used to think... but now I realize' structure appears across several reflections, suggesting a pattern of assumption revision rather than an isolated case. A further example illustrates a similar process of stereotype revision:

"I realize that what we had seen in brief online couldn't reflect the whole culture. I learn from the video about India Market that people tend to stereotyping one value to one country which could be misleading. India market is not as dirty as everyone brag about, and I will learn how to

not judge a book by just one page."

(Anonymous 7, Padlet Reflection 3)

This reflection suggests an awareness that prior media-based impressions of other cultures may have been incomplete. A similar pattern of assumption revision appeared in Anonymous 8's reflection on workplace norms: 'I used to assume that being a few minutes late was acceptable. However, in Singapore's office culture, punctuality and efficiency are highly valued.' Corrections of this kind recurred across several participants' reflections following the VR sessions. A similar pattern of assumption revision also appeared in the video narrative data:

"In discussions, I used to think that speaking up meant being confident and engaged. So, when someone was quiet or indirect, I sometimes saw it as a lack of interest. This class helped me realize that in some cultures, silence can mean respect, careful thinking, or politeness. As I learned more about cultural values, I became more empathic. Instead of reacting quickly, I started pausing and asking myself where someone might be coming from. This helped me listen better and connect more genuinely with people from different backgrounds."

(Anonymous 1, Video Narrative)

This reflection identifies a specific behavior (speaking versus remaining silent), the assumption previously held about it, and a revised understanding — a more specific pattern than a general statement of tolerance. Questionnaire data show a similar shift: 81% of participants said VR made them more sensitive to cultural differences in communication (Q7: 43% agree, 38% strongly agree). Figure 5 shows the distribution of responses to Q7, Q9, and Q10.

Taken together, these reflections and questionnaire responses suggest that VR exposure was associated with a process of internal repositioning toward cultural assumptions, beyond mere exposure to cultural difference.

Contrastive Comparison of Indonesian and Target Cultures as an ICA Strategy

Theme 4 addresses a strategy participants used without being prompted: comparing the target cultures they observed in VR against their existing Indonesian cultural framework. Questionnaire data support this pattern. 90% of participants said VR increased their knowledge of other cultural traditions and communication styles (Q6: 48% agree, 43% strongly agree), and 90% felt VR made them better able to communicate with people from other cultural backgrounds (Q8: 57% agree, 33% strongly agree). All 21 participants (100%) agreed that VR combined with deep learning increased their awareness of intercultural communication in daily life (Q12: 62% agree, 38% strongly agree).

Participants used Indonesian cultural practices as a reference point, but the comparisons were largely non-hierarchical. Indonesian culture was positioned as contextually distinct rather than superior or inferior. Anonymous 9's reflection on

the Japanese classroom illustrates this:

"If this Japanese style were adapted in Indonesia, it could make our learning environment more focused and respectful, but we should still keep our friendly and open attitude."

(Anonymous 9, Padlet Japan Classroom)

The framing 'if... adapted... but we should still keep' suggests selective cultural learning rather than wholesale replacement of existing practices. Anonymous 10 extended this comparison across multiple target cultures:

"In Rajasthan, communication is more expressive and relaxed with a local touch. In the Japanese classroom, communication is formal, polite, and structured... Rajasthan emphasizes the values of cultural heritage, courage, and royal traditions. Japan emphasizes respect, group harmony, and personal responsibility in learning."

(Anonymous 10, Padlet Reflection 2)

This reflection distinguishes between multiple target cultures rather than treating them as an undifferentiated 'other.' Comparisons were not limited to difference: Anonymous 2 noted that the Indian and Indonesian market atmospheres are 'equally lively, warm, and full of social interaction.' Anonymous 11 went a step further, proposing that Indonesian classrooms adopt Japanese standards of cleanliness and comfort. A similar shift appeared in the video narrative data. Anonymous 7 stated:

"I stopped seeing communication as right or wrong, and started seeing it as different."

(Anonymous 7, Video Narrative)

This reframing from a binary evaluative stance (right/wrong) to a descriptive one (different) is consistent with what (Byram, 2021) describes as critical cultural awareness. That a similar shift appears in both Anonymous 7's Padlet reflection and their spoken video narrative suggests the change extended beyond a single written reflection, though a single participant's data cannot establish how durable this shift is.

Authentic Emotional Responses as Markers of Intercultural Awareness

Theme 5 addresses the affective dimension of participants' intercultural awareness. Their emotional reactions varied across scenes and individuals. Questionnaire data show that 62% of participants felt that learning firsthand through VR was more memorable than reading about other cultures (Q11: 38% agree, 24% strongly agree).

Emotional responses varied between EPT and across scenes, reflecting unscripted intercultural encounters. The Japanese classroom alone produced a spectrum: composed admiration ('I felt calm and relaxed because the environment

was so peaceful,' *Anonymous 1*), motivated imitation ('I was very impressed and motivated to imitate their orderly behavior,' *Anonymous 12*), and ambivalence ('a mixture of admiration and amazement, but also like, the atmosphere is really stiff,' *Anonymous 2*). This mix of admiration and discomfort within a single scene suggests a more complex response than straightforward approval.

The Indian market produced the widest effective range. *Anonymous 13* reported exhaustion ('I felt exhausted seeing how crowded and full of social activity the market atmosphere was'). *Anonymous 1* was drawn to its energy. *Anonymous 8* articulated the most integrated response:

"I was impressed because this culture showed that communication is not only about words but also about emotions, gestures, and connection. Even though the market looked chaotic at first, it actually reflected a strong sense of community and warmth. This experience helped me realize that being expressive and emotional in communication can create closeness and harmony."

(Anonymous 8, Padlet Reflection 1)

The shift in language from 'chaos' to 'closeness and harmony' within the same reflection suggests a reframing of the initial impression, rather than a single fixed reaction. *Anonymous 7* expressed a similar sentiment in response to the Singapore office scene: 'Witnessing this harmony truly inspires me to bring the same attitude of respect and openness into my own interactions with others.'

The video narratives provide a distinct spoken register of this affective engagement. *Anonymous 3* reflected on the broader implications of his VR experience:

"VR can help students become more open-minded and more aware of cultural differences. It can be a good starting point to learn, discuss, and reflect before having real interaction with people from different cultures. Understanding culture is not instant, and technology should help us learn, not replace real human communication."

(Anonymous 3, Video Narrative)

Figure 9. A participant engaging with a culturally themed VR scene. This image documents the type of scene associated with the emotional responses discussed in Theme 5, such as expressions of surprise, discomfort, or admiration.



The statement 'technology should help us learn, not replace real human communication' suggests a degree of critical distance alongside his positive engagement with VR, rather than uncomplicated enthusiasm. Anonymous 7 demonstrates a similar pattern of behavior:

"I no longer expect others to adjust to my way of communicating. Instead, I see intercultural communication as a shared effort to understand each other, something I will carry with me beyond this class."

(Anonymous 7, Video Narrative)

Both Anonymous 3 and Anonymous 7 raised this point without being prompted, which suggests these reflections were not simply responses expected by the researcher, though this study cannot confirm whether these attitudes carry over into participants' actual teaching practice. The variation in reactions across EPTs and across scenes is also interesting to analyze and think of it as a kind of affective diversity. VR doesn't make everyone react the same way. Each student has their own reaction: some are influenced by their cultural background, some are shaped by past experiences, and others simply draw different affective conclusions. This kind of variation isn't a weakness in the data but rather evidence of the diversity of the data collected. It validates the authenticity of the encounter: EPT articulated genuine, individualized meaning-making rather than performing expected reactions. Taken together, the five themes suggest that VR-integrated deep learning functioned as a multidimensional influence on participants' intercultural competence. Themes 1 and 2 indicate that VR created an immersive learning space in which the three dimensions of deep learning joyful,

meaningful, and mindful appeared to co-occur. Themes 3 through 5 suggest this immersive engagement was associated with changes in cultural assumptions, a more contrastive understanding of cross-cultural knowledge, and affective responses that varied across participants and scenes. Questionnaire data, including unanimous agreement on Q3 and Q12, are broadly consistent with the patterns observed in the Padlet and video narrative data. These findings are discussed in relation to existing theory and literature in the following section.

4. Discussion

The results of this study indicate that combining the use of Virtual Reality (VR) with a deep learning approach can help shape the way prospective English teacher education (EPT) students understand and analyze intercultural communication, both emotionally and through their cognitive understanding. One of the strengths of this study is that EPT students reported being able to clearly distinguish their learning experiences using VR from their typical classroom experiences; for them, VR is not merely an additional tool for learning, but a learning environment that offers a distinct experience, with its own unique characteristics and lasting memories. This aligns with the findings presented by (Adelana et al, 2023), which show that the use of VR in learning can help students develop a deeper understanding and foster empathy through simulations involving various cultures. One such scenario involves trying to experience what it is like to interact directly with another culture, something that is usually quite difficult to do. The way EPTs describe their experiences using recurring patterns indicates that VR is not merely viewed from a distance as if being watched or observed from the outside but is truly “experienced firsthand,” as if the EPTs were actually present in the situation themselves. This aligns with the findings of (Kolb & Kolb, 2017), who noted that the most meaningful learning involves gaining a deep understanding through real-world experiences. This is further reinforced by questionnaire data showing that 71 % of participants felt that the VR method made intercultural learning feel more real and meaningful, whilst 76% of respondents felt more engaged than when attending regular classes. However, these figures reflect self-reported perceptions rather than the results of independent observations of engagement, and are based on a single sample group comprising just 21 students. Similar findings also emerged in a study conducted by (Mahaputri, R.A., et al., 2026), which demonstrated that digital tools can enhance an individual’s skills and ability to understand all aspects of intercultural communication by providing users with opportunities for direct and more meaningful engagement. Beyond immersion, VR activated all three dimensions of deep learning, joyfull, meaningful, and mindful, simultaneously rather than sequentially, consistent with (Kristiawan and Istiqomah, 2025) (Kristiawan and Istiqomah, 2025) state that these three pillars of deep learning occur sequentially: Joyfull Learning → Meaningful Learning → Mindful Learning. However, research findings suggest that all three occur simultaneously. a pattern consistent with the questionnaire and

reflection data collected in this study. The results of a survey of all 21 participants at this institution show that they agree that learning with VR is an enjoyable and non-burdensome learning method for prospective students of the English Language Education programme, although this consensus may partly reflect the homogeneity of the sample rather than an effect that can be universally generalised. This suggests that VR may help reduce the sense of monotony and awkwardness that typically arises when studying other cultures, especially on topics that can sometimes be sensitive. Regarding the “meaningful” aspect, this was observed when participants attempted to compare one culture with another not merely gathering information, but truly understanding and processing it on their own. This ties into (Kolb & Kolb, 2017) stages of reflective observation and abstract conceptualization, in which real-world experiences may be transformed into insights that can be applied in other contexts a process this study's self-reported reflections appear to illustrate, though such transformation cannot be independently verified from the data available.

Unlike the model proposed by Kristiawan & Istiqomah (2025), which assumes a sequence of “joyfull-meaningful-mindful” based on a step-by-step instructional structure, 360° VR presents all three as a single multisensory experience. The novelty and pleasure of immersion, meaningful connections to real-world cultural experiences, and full attention engagement arise simultaneously from the same design elements, rather than from separate pedagogical stages. These findings suggest a revision of deep learning models: sequentiality may not be an inherent property of these three dimensions, but rather an artifact of conventional learning media that are fragmented into discrete stages.

Beyond immersion and engagement, the findings also point to a shift in participants' cultural assumptions that unfolds in a way consistent with process models of intercultural competence and the present self-reported data appear consistent with this interplay, though the qualitative and self-report nature of the data means this correspondence cannot be treated as confirmatory. The recurring 'I used to think... but now I realize' pattern, together with specific corrections such as those concerning workplace punctuality or the meaning of silence in communication, suggests a cognitive shift resembling what (Bennett, 2017) describes as movement from ethnocentrism toward ethnorelativism: participants moved from general assumptions toward more particular, situated understanding.

This cognitive shift did not appear in isolation from participants' emotional responses. Variation in participants' emotional reactions, ranging from admiration to discomfort within the same reflection, is consistent with (Chen & Hu, 2023) view of affective sensitivity as inseparable from cognitive understanding within intercultural competence, and several participants' stated intentions to carry attitudes of openness beyond the VR session point toward the kind of behavioral outcome (Deardorff, 2019) identifies as the outer layer of intercultural

competence, though self-reported intentions alone cannot confirm whether this behavior is sustained in practice.

The contrastive comparisons participants drew between Indonesian and target cultures extend this same process into practical application. Rather than treating the VR scenes as isolated examples of cultural difference, participants consistently related them back to their own cultural framework, evaluating practices as different rather than hierarchically better or worse, and in some cases proposing how specific practices might be adapted to Indonesian contexts. This pattern is consistent with what (Byram, 2021) terms critical cultural awareness, and these data demonstrate that students' cognitive and affective development has evolved into applied intercultural competence and is no longer merely a matter of understanding attitudes. However, because this research is based on case studies with limitations in the local sample, this trend should be viewed as a case illustration and does not have external validity to represent the characteristics of prospective teachers in general.

5. Conclusion

This study examines how the use of VR combined with a deep learning approach is perceived to enhance intercultural awareness among prospective English teachers (EPT). After analyzing the three data sources using Padlet artifacts, video narratives, and questionnaire responses, the results indicate that EPTs do not merely view VR as a classroom learning tool. Rather, they regard it as something that represents a truly new learning style. It also complements the three pillars of deep learning engaging and non-monotonous learning, meaningful learning (where content is directly linked to students' real-life experiences), and mindful learning (where students and teachers are fully aware and active throughout the learning process, understanding why and how the material is being learned) as described by (Kristiawan and Istiqomah, 2025). These three aspects occur continuously and simultaneously for every student. They also align with how students view various other cultural aspects. Many prospective English teachers are beginning to question the views they have held for years regarding merely having a general understanding of a culture. They also build cross-cultural knowledge without positioning one culture as superior to another, and the emergence of distinctive affective responses which, according to (Chen & Hu, 2023) and (Deardorff, 2019) serve as markers of genuine intercultural competence, rather than mere knowledge. The two research questions posed at the outset are answered by these findings, and VR-deep learning appears to be a promising new approach for pre-service teacher education.

The main limitation of this research lies in its case-study approach, which was conducted at a single institution and relied on participants' subjective (self-reported) data; consequently, it lacks external validity and cannot be generalised. On this basis, future research should expand the sample to include various educational institutions. And then, the use of longitudinal designs and direct

classroom observation techniques is highly recommended to verify the stability of these cognitive-affective changes, as well as their effectiveness in real-world pedagogical thinking and practice. Furthermore, the ethical procedures in this study had two shortcomings: consent to cite participants' data in publications was given verbally rather than in writing, and the study relied solely on permission from the course lecturer and written consent for general participation in the research.

2. References

- Adelana, O. P., Ayanwale, M. A., Ishola, A. M., Oladejo, A. I., & Adewuyi, H. O. (2023). Exploring pre-service teachers' intention to use virtual reality: A mixed method approach. *Computers and Education: X Reality*, 3. <https://doi.org/10.1016/j.cexr.2023.100045>
- Aisyah, S. (2025). *Enhancing Intercultural Competence through Virtual Reality and Artificial Intelligence: A Mixed-Method Study in an Indonesian Private University EFL Classroom*. <https://creativecommons.org/licenses/by/4.0>
- Baker, W. (2024). Intercultural communication. In *ELT Journal* (Vol. 78, Number 2, pp. 212–215). Oxford University Press. <https://doi.org/10.1093/elt/ccad040>
- Bani, M., & Masruddin, M. (2021). Development of Android-based harmonic oscillation pocket book for senior high school students. *JOTSE: Journal of Technology and Science Education*, 11(1), 93-103.
- Bennett, M. J. (2017). *Developmental Model of Intercultural Sensitivity*. www.idrinstitute.org
- Braun, V., & Clarke, V. (2023). Toward good practice in thematic analysis: Avoiding common problems and be(com)ing a knowing researcher. In *International Journal of Transgender Health* (Vol. 24, Number 1, pp. 1–6). Routledge. <https://doi.org/10.1080/26895269.2022.2129597>
- Byram, M. (2021). *Teaching and Assessing Intercultural Communicative Competence* (2nd ed.). Multilingual Matters. <https://doi.org/10.21832/9781800410251>
- Chen, H., & Hu, B. (2023). On the intercultural sensitivity of university students in multicultural regions: A case study in Macao. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1090775>
- Deardorff, D. K. (2019). *Manual for Developing Intercultural Competencies* (1st ed.). Routledge. <https://doi.org/10.4324/9780429244612>
- Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Ismayanti, D., & Syam, A. T. (2022). The Community Manipulation through Big Brother™'s Tyranny in George Orwell™'s Nineteen Eighty-Four. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, 10(2), 1556–1569.

- Kolb, A. Y., & Kolb, D. A. (2017). Experiential Learning Theory as a Guide for Experiential Educators in Higher Education. In *Experiential Learning & Teaching in Higher Education* (Vol. 7, Number 1). <https://nsuworks.nova.edu/elthe/vol1/iss1/7>
- Kristiawan, D., & Istiqomah, L. (2025). EFL Students' Perspectives on VR-Mediated EAP in the Indonesian Higher Education Settings: A Qualitative Case Study. *The Art of Teaching English as a Foreign Language (TATEFL)*, 6(2), 221–234. <https://doi.org/10.36663/tatefl.v6i2.1104>
- Mahaputri, R. A., Hendriwanto, H., & Kusriandi, W. (2026). Using Mobile Language Learning Technology to Promote Intercultural Awareness: Insights From an Extensive Listening Class. *Jurnal Pendidikan Terapan*, 178-185.
- Miller, E. M., Porter, J. E., & Barbagallo, M. S. (2023). Simplifying Qualitative Case Study Research Methodology: A Step-By-Step Guide Using a Palliative Care Example. *Qualitative Report*, 28(8), 2363–2379. <https://doi.org/10.46743/2160-3715/2023.6478>
- Nadeem, M. U., & Zabrodskaia, A. (2023). A comprehensive model of intercultural communication for international students living in culturally diverse societies: evidence from China. *Frontiers in Communication*, 8. <https://doi.org/10.3389/fcomm.2023.1332001>
- Naranjo-Toro, M., Basantes-Andrade, A., Meneses, M., & Guerra, J. (2026). Digital approaches to intercultural competence in higher education—a PRISMA systematic review with bibliometric and SWiM evidence. In *Frontiers in Education* (Vol. 11). Frontiers Media SA. <https://doi.org/10.3389/feduc.2026.1725080>
- Pesic, M. (2023). CRITICAL DISCOURSE ANALYSIS AS A CRITICAL SOCIAL STUDY: NORMAN FAIRCLOUGH'S APPROACH. *Politička Revija*, 74(4/2022), 89–113. <https://doi.org/10.22182/pr.7442022.4>
- Safira, S., & Astuti, P. (2025). *Conceptualizing the Implementation of Deep Learning in ELT through Cooperative Learning for Teaching Speaking Skills at the High School Level* (Vol. 42, Number 2). <https://journal.unnes.ac.id/journals/JPP>
- Sarwari, A. Q., Adnan, H. M., Rahamad, M. S., & Abdul Wahab, M. N. (2024). The Requirements and Importance of Intercultural Communication Competence in the 21st Century. In *SAGE Open* (Vol. 14, Number 2). SAGE Publications Inc. <https://doi.org/10.1177/21582440241243119>
- Sehlaoui, A. S., & Zaid, H. (2025). A CALL to threaten systemic inequities through critical crosscultural communicative competence in future teachers: Engaging ELs in STEM using a critical conceptual framework. *Journal of STEM Teacher Education*, 59(1). <https://doi.org/10.61403/2158-6594.1521>
- Wibowo, A. H., Mohamad, B., Djatmika, & Santosa, R. (2024). Designing and assessing experiential learning pedagogy for an intercultural

Ainin Nur Fadillah, Ratna Andhika Mahaputri, Siti Aisyah

Exploring English pre-service teachers' perspectives on integrating virtual reality with a deep learning approach in an intercultural communication course.

communicative competence training module: a quasi-experimental study.

Frontiers in Education, 9. <https://doi.org/10.3389/feduc.2024.1470209>