ARTICLE

Using immersive virtual reality for the assessment of intercultural conflict mediation

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Abstract

This exploratory study adopted immersive virtual reality (VR) technology to develop a task assessing college students' intercultural competence, specifically their ability to mediate an intercultural conflict. Participants were 22 students enrolled in the intercultural communication class in a U.S. university. They first completed a pre-conflict mediation task using a VR platform following three steps: (a) reading a scenario describing a conflict situation between people from different cultures; (b) observing two people having a conflict in a 360-degree VR video; and (c) mediating the conflict on-the-spot by proposing a solution to the conflict. After completing the pre-task, they attended two class sessions (75 minutes each) that aimed to develop their conflict mediation skills. After the sessions, they completed a post-conflict mediation task following the same steps as the pre-task. A comparison between the pre- and post-task performance revealed significant gains in conflict mediation skills assessed on five dimensions: social initiative, empathy, perspective-taking, solution, and clarity in discourse. Survey data showed that the VR task evoked realistic emotions from witnessing a conflict, which in turn prompted the participants to take initiative in mediating the conflict.

Introduction

Responding to globalization and increased international mobility, there is an urgent need to develop people's intercultural competence. According to Byram (2012), a successful intercultural speaker has two distinct yet interdependent competences: *communicative* and *intercultural*. The former involves the ability to communicate effectively, while the latter refers to traits and attitudes that help people engage with cultural differences. These two competences together assist people's ability to communicate effectively in intercultural settings.

While the importance of intercultural competence is clear, most existing studies have used a survey instrument measuring students' perceived intercultural competence. Very few studies have assessed students' actual performance in intercultural settings (Griffith et al., 2016). Yet, a performance-based assessment is critical because it sheds light on how students can actually navigate through intercultural encounters. To this end, immersive virtual reality (VR) could prove useful for creating an assessment tool. Affordances of VR technologies, such as multimodal cues, immersive environments, and lifelike simulations, can provide students with first-hand intercultural experiences in realistic settings.

Using immersive VR technology, this exploratory study assesses college students' intercultural competence as they mediate a conflict situation between culturally-different others. Intercultural conflict mediation is a critical aspect of intercultural learning because, as Spitzberg and Changnon (2011) claim, intercultural competence involves "the appropriate and effective management of interaction between people who, to some degree or another, represent different or divergent cognitive, affective, and behavioral orientations to

the world" (p. 7). Hence, key aspects of intercultural competence, such as perspective-taking, empathy, flexibility, and effective communication skill, are likely to develop while acting as a conflict mediator in intercultural settings. To assess these aspects, a conflict mediation task is developed incorporating a series of 360-degree VR videos. The task is used in the pre-post design to examine how students' performance changes after they receive instruction focusing on conflict mediation skills. Students' changes are assessed based on their use of conflict mediation strategies. In addition to the performance data, students' reported perceptions of the VR task are examined to assess benefits of the immersive VR as applied to intercultural learning and assessment.

Background

Intercultural Competence

Intercultural competence involves a body of knowledge, skills, attitudes, and personality traits that help people communicate effectively and appropriately while engaging with cultural differences (Byram, 2012; Deardorff, 2006; Fantini, 2012; Spitzberg & Changnon, 2011). Currently, there are more than 30 theoretical models of intercultural competence encompassing over 300 constructs (Leung et al., 2014). Those constructs are categorized into three areas: (a) traits, (b) attitudes, and (c) capabilities (Leung et al., 2014). Traits involve personal characteristics that determine a pattern of behaviors in culturally diverse settings. Flexibility, openness, empathy, perspective-taking, and emotional stability are some of the primary traits. Attitudes, on the other hand, determine how people view their culture in relation to other cultures. Ethnorelative (as opposed to ethnocentric) worldview is a prime example of this category. Finally, intercultural capabilities refer to people's ability to communicate effectively in intercultural settings, drawing on a range of resources such as knowledge of other cultures (Byram, 2012; Fantini, 2012) and adaptability to communicative situations (Gudykunst, 1993).

These traits, attitudes, and capabilities have been the foci of instruction and assessment of intercultural competence. Intercultural education, as Huber and Reynolds (2014) put it, involves "a pedagogy—aims, content, learning processes, teaching methods, syllabus and materials, and assessment—of which one purpose is to develop intercultural competence in learners of all ages in all types of education as a foundation for dialogue and living together" (p. 27). As this definition indicates, intercultural education is a holistic process that combines ongoing instruction and assessment for intercultural development. Huber and Reynolds present five principles that can inform the design of instruction and assessment (pp. 28–30):

- Experience: Experience how people act and communicate
- Comparison: Compare cultures for similarities and differences in a non-judgmental way
- Analysis: Analyze values and beliefs underlying cultural behaviors
- Reflection: Reflect on cultural analysis and develop critical awareness
- Action: Take action to engage with people who have different cultural affiliations

These five principles together indicate that intercultural competence develops not only by promoting learners' understanding and reflection of cultures, but also by supporting their action and participation in intercultural engagement.

Teaching Intercultural Competence

A number of tasks have been implemented to develop intercultural competence in formal classrooms (Liddicoat, 2011). Experiential learning, cooperative learning, and project-based learning have been the main approaches that guide the design of tasks and activities (Huber & Reynolds, 2014). Task types are wide-ranging, including role-plays and simulations, ethnography for cultural discovery, film and literary text analysis, analysis of cultural artifacts, group discussions, image-making, telecollaborative projects, and social media interaction.

One emerging trend is the application of immersive virtual reality (VR) to instructional task development.

Song (2019) created 360-degree videos filmed in South Korea and used them in a college-level Korean language class. Students watched authentic restaurant scenes in VR videos and took notes on cultural products, practices, and perspectives depicted in the videos. Then, they role-played ordering food using VR simulations. Students' reflection papers and interviews showed that VR-based instruction promoted their cultural awareness and curiosity about Korean culture. In another study, Akdere et al. (2021) developed VR simulations in which participants (undergraduate students in a U.S. university) interacted orally with people in pre-recorded 360-degree videos. The simulations illustrated a joint project with their imagined counterparts in Latin America. Pre-post survey results revealed participants' increase in cultural knowledge and intercultural sensitivity, but no gain was found in the areas of ambiguity tolerance and comfort with difference. In Shadiev et al.'s (2020) study, college students in China and Uzbekistan introduced their local culture by presenting 360-degree videos capturing local scenes. Participants' intercultural competence assessed via survey revealed gains in cultural knowledge and awareness, attitude, and skills. Li et al. (2020) provided Chinese youth exposure to ethnic minorities in Hong Kong via 3D animations. Gamification elements were added to VR scenarios in that participants had to discover information embedded in a VR scene in order to proceed to the next scene. Pre-post survey data revealed gains in interaction engagement, confidence, and attentiveness, but not in interactional enjoyment or respect. Finally, in Mills et al.'s (2020) study, students of French completed a five-day unit that exposed them to narratives of four Parisians recorded with a 360-degree camera. Pre-post survey data showed that the students developed more nuanced understanding of French culture after the VR sessions. They also improved their vision of French culture and their future role as participants in the French community.

These studies clearly support the benefit of using VR technologies for intercultural development. Immersive VR can help participants experience authentic environments by using VR headsets, which can generate embodied experience and a sense of presence (Rupp et al., 2019). Through VR simulations, participants have first-hand experiences of intercultural encounters that would otherwise be difficult to experience without actually being in the target culture. Direct participation in realistic intercultural situations can help develop core traits of intercultural competence, such as empathy, perspective-taking, flexibility, and ambiguity tolerance (Song, 2019). Rich multimodal input available in the virtual space can help develop the skill of analyzing contextual cues to understand meaning, which is a critical aspect of intercultural learning.

Assessing Intercultural Competence

While the benefits of immersive VR for intercultural learning are promising, existing studies have mainly adopted VR to develop instructional materials, and application of the technology to assessment tasks is under-represented. Most assessment work has been done using a survey instrument, which measures students' perceived (not their actual) intercultural knowledge and skills. A number of surveys exist in the field in a range of formats, including Likert-scale items, multiple-choice questions, and forced judgement responses (Fantini, 2006; Griffith et al., 2016). Survey items are created to assess theoretically motivated constructs of intercultural competence.

For example, Van der Zee and Van Odenhoven (2000) created the Multicultural Personality Questionnaire (MPQ) to assess five personality factors of intercultural success: cultural empathy, openmindedness, social initiative, emotional stability, and flexibility. Cultural empathy refers to the capacity of identifying with others' feelings and thoughts, while openmindedness and flexibility help people to be open to cultural differences and adapt to new situations. Social initiative allows people to take initiative in intercultural interactions, while emotional stability helps people stay calm even when such interactions are stressful. The MPQ assesses these personality factors using 91 Likert-scale items. Validity and reliability of the MPQ were confirmed by Van Odenhoven and Van der Zee (2002) who administered the MPQ to 305 students of international business schools in France and Netherland. They found that the MPQ significantly predicted the participants' adjustment to the business school over time, explaining 12–17% of the variance in mental health, physical health, and psychological well-being. In a subsequent study involving 102 expatriates in Taiwan, the dimension of emotional stability was found to be the most consistent predictor of cultural

adjustment, while dimensions of social initiative, cultural empathy, and flexibility predicted different aspects of adjustment (e.g., psychological well-being, life and job satisfaction) (Van Odenhoven et al., 2003).

Despite the popularity of survey measures, the self-report nature of survey-based assessment has several limitations. First, participants potentially overestimate or underestimate their knowledge and skills, leading to inaccurate representations of their intercultural competence. In addition, survey responses may be confounded with students' experience, that is, those who have limited intercultural exposure may have difficulty in reflecting on their skills and behaviors related to intercultural competence (Griffith et al., 2016). Given these limitations, a performance-based measure assessing students' actual behaviors in intercultural settings may provide a more reliable estimate of their intercultural competence. Such a measure can incorporate the intercultural traits, attitudes, and capabilities defined in survey measures so students' performance can be a direct reflection of those dimensions. The Intercultural Competence Assessment Project (INCA, 2004) is an example of such a performance assessment. Participants respond to a variety of intercultural scenarios using their own language. They also perform a collaborative role in a group. Key dimensions of intercultural competence—empathy, ambiguity tolerance, respect for otherness, and communication awareness—are incorporated into a rubric as assessment criteria.

A benefit of performance-based assessment is that students can directly place themselves in a situation where cultural differences are apparent. They can decide how to behave in such a situation and take a course of action while considering how the situation is going to unfold. While the dynamic nature of intercultural interaction can be simulated using a scenario, in-person simulations have practical constraints in terms of time and resources. An alternative approach is using VR-based simulations that can replicate real-life intercultural experiences that are often hard to come by. The correspondence between the real-life situation and the assessment situation helps improve the authenticity and ecological validity of assessment tasks. What participants can do in a virtual space is a likely representation of what they can do in real-life situations, enhancing both content and construct validity of assessment.

Content and construct validity can be promoted by embodied cognition and embodied experience generated by the immersive VR technology (Johnson-Glenberg, 2018). Embodied cognition refers to the idea that the mind, body, and environment are intricately connected and that cognitive states are "grounded in bodily states and activities" (Atkinson, 2010, p. 599). When students are placed in a context-rich VR environment, various aspects of the body, such as motor and perceptual systems, are stimulated, shaping their cognition. Hence, what students say and how they react in a VR space are likely to be a direct reflection of their cognition, which, in the case of this study, is about their understanding of and reflection on intercultural experiences.

Drawing on various affordances of immersive VR technologies—authenticity, feeling of presence, and embodied experience—this preliminary study develops an assessment task of intercultural competence. The task provides intercultural conflict simulations via 360-degree videos. It is given before and after teaching conflict mediation skills to assess students' development in that area.

Intercultural Conflict Mediation

Intercultural conflict mediation was selected as the target area of the present study because it is considered one of the major challenges of intercultural interactions (Jackson, 2020). Linguistic and cultural differences among individuals or group members often become a source of a disagreement and conflict. As Ting-Toomey (2012) claims, intercultural conflicts occur "because of our lack of necessary and sufficient knowledge to deal with culture-based conflict communication issues competently" (p. 279). Hence, it is important that we develop knowledge and skills to resolve conflicts in an effective and peaceful manner. Jackson (2020) emphasizes that intercultural conflict competence entails specific facework strategies unique to conflict situations. Some of the core elements of that competence involve cultural knowledge, attentiveness to the other's assumptions and emotions, constructive communication skills, and flexibility (Ting-Toomey, 2012). Incorporating these core elements, Jackson (2020, pp. 263–264) presents several

strategies for conflict mediation, including:

- Look for common grounds among people in conflict.
- Listen attentively. Try to be patient and attend to what others are saying.
- Try to understand both sides of an issue and be open to different perspectives.
- Be sensitive to face and identity needs. Show respect for the other person's position.
- Avoid personal attacks and offensive language.
- Generate possible solutions to the conflict that are mutually acceptable.

In this study, these strategies serve as the focus of instruction and assessment. Participants are taught how to use these strategies in class, and their strategy use is assessed using VR simulations that illustrate intercultural conflict situations. Instruction and assessment combined are considered to provide a holistic process of intercultural learning, which in turn helps develop key components of intercultural competence, specifically perspective-taking, empathy, emotional stability, flexibility, and effective communication.

Research Questions

1. Do college students improve their performance of intercultural conflict mediation as assessed by a task using immersive VR technology?
2. What are the students' perceptions of the VR-based assessment task?

Method

Participants

Participants were 22 students enrolled in the capstone course in a U.S. university. There were four male and 18 female students with a mean age of 22 ranging from 19 to 31. There were 10 seniors, eight juniors, one sophomore, and three graduate students. Five students were international students from China, Taiwan, Germany, and Saudi Arabia (with a minimum TOEFL score of 85 for admission), and the rest were Americans. The students from China and Saudi Arabia had lived in the U.S. for almost two years at the time of data collection, while the Taiwanese student and German students had lived in the U.S. for one semester. Other than these five international students, no students had prior experience living in a foreign country for more than a month. All participants except for three had learned more than one language.

Instruction

Structure

The instruction focusing on intercultural conflict mediation took place over two class sessions during the semester (75 minutes each). The instruction was structured according to Huber and Reyolds' (2014) five principles of intercultural development: experience, comparison, analysis, action, and reflection (see the Background section). In the first session, after observing a video illustrating an intercultural conflict situation, students compared perspectives of two people who were in conflict and analyzed how their perspectives were culturally bound. In the second session, students learned how to act as a conflict mediator. They watched a video illustrating conflict-mediating strategies and practiced those strategies in role-plays. Then, they reflected on their role-play performance.

Content

While Huber and Reyolds' (2014) principles guided the structure of instruction (how to teach), the content of the instruction (what to teach) followed Van der Zee and Van Oudenhoven's (2000) five dimensions of intercultural success:

- Social initiative: Tendency to approach social situations actively and take initiative
- Cultural empathy: Ability to identify with others' feelings, thoughts, and behavior

- Openmindedness: Ability to be open to different values and norms
- Emotional stability: Ability to remain calm in stressful situations
- Flexibility: Ability to adjust behavior to new and unknown situations

These dimensions were adapted to teach conflict mediation. *Social initiative* was determined as willingness to intervene to mediate a conflict between two individuals from different cultures while presenting a specific solution that benefit both parties. *Cultural empathy* and *open-mindedness* were determined as ability to recognize both parties' perspectives and the cultural values behind them. *Emotional stability* and *flexibility* were operationalized as ability to speak clearly, logically, and calmly while mediating a conflict.

The conflict scenario used in the instruction featured two individuals, Mateo from Mexico City and Sarah from New York City. They were both marketing directors at an international company. Mateo had just been transferred to the company's branch office in New York City to help Sarah. One day in the evening when Mateo was getting ready to go home, Sarah asked him to stay longer so they could finish creating a marketing video. Mateo insisted that the video can wait until tomorrow, but Sarah wanted to finish it immediately so they could use it the next day. This conflict scenario was developed into a play script by a professional playwright. Two hired actors acted out the play to produce a two-minute video. Table 1 displays a summary of instructional activities created around this video.

Table 1

Instructional Activities

	Focus	**Activities**
Session 1	• Comparison • Analysis	• Students listened to a lecture on intercultural conflict management. • Students read a text describing the cultural background of two people in conflict and responded to questions (e.g., *Who are they? What are their perspectives? Are the perspectives influenced by their cultures?*). • Students watched a video illustrating the conflict and answered questions (e.g., Describe the main problem. Explain perspectives of the people in conflict. Present a possible solution.).
Session 2	• Experience • Action • Reflection	• Students watched a video illustrating strategies for conflict mediation (e.g., expressing empathy and taking the other's perspective). • Students practiced the strategies by role-playing conflict mediation situations. • Students self-assessed their role-play performance as a conflict mediator using a rubric reflecting Van der Zee and Van Oudenhoven's (2000) five dimensions of intercultural success (see the next section).

During the instruction, the following conflict mediation strategies and expressions were taught, based on Van der Zee and Van Oudenhoven's (2000) five dimensions of intercultural success.

1. Initiative: Recognizing the problem explicitly and initiating mediation
     e.g., *I understand that you are having a problem with workload distribution*.
2. Empathy: Expressing empathy and understanding
     e.g., *I can see you are feeling overwhelmed and feeling unsupported. I wanted you to know that I'm here for you*.
3. Perspective-taking: Acknowledging people's perspectives

e.g., *I see that X values overtime work, but family life after work is important for Y*.

4. Solution: Presenting a solution with specific action plans

    e.g., *Let's think about who we might be able to get help from. To whom can we delegate? What about Ally? She has some room this week. You and I can split the rest*.

5. Clarity: Speaking clearly

Assessment

A VR-based task assessing skills of intercultural conflict mediation was developed and used before and after the instruction (pre-post). The VR task had two components: (a) a scenario describing a conflict between two individuals from different cultures (e.g., the individuals' cultural background and contrasting perspectives) and (b) a 360-degree video illustrating the conflict scene. In order to reduce the practice effect coming from repeating the same task, two parallel versions of the task were developed and used before and after the instruction. The two conflict situations used in the task (pre- and post-tests) were selected based on a pilot study, which involved administering a survey to 38 college students in an international university in Japan. The survey asked them to report intercultural conflict situations that they had experienced on campus. Two common conflict situations were selected from their responses. The following excerpts are abbreviated conflict scenarios (see the Appendix).

Conflict scenario, pre-test

Misako is taking a class in European history at an international university in Japan. The class watched a video on the fall of the Berlin Wall in 1989. After that, Misako is placed in a group with Kat, a German student. The professor asked the group to discuss the video. Misako doesn't want to say anything because she is not used to discussing ideas in class. In Japanese classes, students just listen and take notes. Kat is frustrated with Misako's silence because he wants to know what Misako thinks about the video.

Conflict scenario, post-test

Mika is a Japanese student studying information technology at an international university in Japan. There are many group projects in the class. Mika has been placed into a group with Andrew, an American student from New York City. The group hasn't made progress on their assignment. Andrew is often late for group meetings. Mika thinks he is not responsible enough for the project. Andrew, on the other hand, thinks that it is OK to be late for meetings as long as he completes the work assigned to him.

Based on these scenarios, two play scripts illustrating the conflict situations were developed by a professional writer. Two actors studying theater in a U.S. university acted out the scripts, which were recorded to produce 360-degree video clips (2–3 minutes per play). The videos were loaded into a VR headset. Participants first read a conflict scenario describing two main characters' perspectives and then put on a VR headset to watch a 360-degree video of two people acting out a conflict. At the end, the two actors in the video turned to face participants, and then the video froze. Participants were instructed to talk to the people when the video froze. Figure 1 presents a screenshot of the video.

Screenshot of a 360-Degree Video of a Conflict Situation (Pre-Test)

Participants' speech was video-recorded and transcribed verbally. We evaluated the speech using a rubric which reflects Van Oudenhoven and Van der Zee's (2000) five dimensions of intercultural success (Table 2). *Social initiative* was evaluated in terms of whether participants intervened to mediate the conflict situation and presented a specific solution benefiting both parties. *Cultural empath*y and *open-mindedness* were assessed on whether participants recognized both parties' perspectives based on their respective cultural backgrounds. *Emotional stability* and *flexibility* were assessed on participants' ability to speak clearly and logically while mediating a conflict.

Below is a sample response from the post-test. In this VR video, a Japanese student (Mika) and an American student (Andrew) are having an argument because Andrew is often late for the group project meeting. This participant received a full score of 4 on the dimension of Initiative because she clearly initiated the conflict mediation and remained involved. She received a score of 3 on Solution. Although she suggested that they can work on the project individually first and then work together when all people gather at the meeting, she did not provide a concrete solution to Andrew's tendency of being late. She received a full score of 4 on Empathy because she used emphatic language (e.g., *"I know you're…"*. *"I know it feels like…"*) and checked on people's feelings *("Sound good everyone?"*). She also acknowledged both parties' perspectives (score of 4 on Perspective-taking). Her response was also well-structured (score of 4 on Clarity): she presented her interpretations of the problem objectively by considering both sides of the argument, presented a solution to the problem, and ended with a collaborative tone.

Sample post-test response, Participant #2

Alright, let's just take a moment to take a couple of breaths here. Andrew, I… I know you're hungry and needed to stop by, but at the same time… it's hard for them to start working on things, especially like the more group oriented tasks, if you aren't here, so… just, maybe try to be more conscientious about being early like Mika's pointed out And then Mika, like, Andrew's not intentionally trying to disrespect, and I know it feels like that [he is]... but at the same time… he is making the effort and he is trying to get here. So… maybe, you guys can at least work on the more individually oriented tasks, so the ones where you don't need Andrew here to work on… though, just in case he runs late, like start with the individual tasks, and then move on to the group tasks. And… um… if there's something he needs to do for one of the group tasks in order for it to be ready, um… then it might just need to wait for next time. And, on another note Andrew, too, I think you should talk to the professor about you

being late, just if you haven't already. Sound good everyone?

Table 2

Assessment Rubric

	Initiative	**Solution**	**Empathy**	**Perspective-taking**	**Clarity**
4	Initiated the mediation actively and showed involvement	Solution was provided with useful details and specifics	Explicitly recognized the addressees' feelings	Explicitly acknowledged perspectives of both parties	Spoke clearly and logically
3	Initiated the mediation but not very active	Solution was provided with some details	Recognized the addressees' feelings but only sparsely	Addressed perspectives of both parties but only sparsely	Spoke some-what clearly and logically
2	Initiated the mediation but not involved	Solution was provided but it was vague and lacking details	Showed minimum understanding of the addressees' feelings	Addressed the perspective of only one party	Speech was not very clear/ logical; used emotional language
1	Did not initiate the mediation	No solution was provided	Did not recognize the addressees' feelings at all	Did not address the addressees' perspectives at all	Speech was disorganized and hard to follow

Survey

After completing the post-test, participants filled out an online reflection survey involving three open-ended questions. The first two questions asked them to describe what they thought was happening in the video and why it was happening. The third question asked the participants to report their perceptions about the VR task by responding to the question: *"What did you think about the VR task you just completed?"* Participants' responses to the third question were analyzed in this study in order to answer the second research question.

Data Analysis

The first research question asked whether participants made any gains in their conflict mediation skills after participating in the instruction sessions. Participants' spoken data from the VR-based assessment task were compared between the pre- and post-tests. Speech samples were transcribed, and two fluent speakers of English (one native and one nonnative speaker) rated all the samples. Speakers of different language backgrounds were selected as raters because intercultural communication often takes place between native and nonnative speakers. Both raters participated in a norming session lasting for one hour. They studied the scoring rubric (Table 2) and rated a few samples together. After the sample rating, areas of discrepancy were identified, and scoring rubric was adjusted accordingly. Then, they rated the rest of the samples independently, and their scores were compared. Interrater reliability was .83, which is considered appropriate. When the samples had two points off in rating, the raters discussed their rating to reach a consensus. For the cases with one point off, an average score was assigned as the final score. Because of the small sample size, the nonparametric test of the Wilcoxon signed ranked test was used to compare the difference between the pre and post-test score.

The second research question addressed participants' perceptions of the VR-based assessment task. Participants' responses to the open-ended survey question were analyzed thematically for notable trends (Braun & Clarke, 2006). The researcher first segmented the responses by individual thought unit (i.e., unit

expressing the same idea) and then assigned a label to each thought unit. After that, she compiled the labels to identify common themes. The sample below illustrates the analysis. The first thought unit received the label of "positive" because he expressed that the VR tool was "an interesting experience" and "a good way" of assessment. The second unit was labeled as "negative" because he felt "awkward" speaking to people in the video. The last unit was labeled as "emotion" because he reported "intense emotions" provoked in VR. A total of four themes emerged in the analysis: positive, negative, emotional, and authentic experience.

Sample survey response, Participant #6

I think it is an interesting experience and a good way to test a person's response to conflicts arising from cultural differences (positive) / It is a little awkward to respond to people who are not able to speak back and remain frozen the whole time (negative) / but once you get past that it becomes a valuable tool (positive) / It is better than just reading a piece of paper with a scenario on it because it actually demonstrates the intense emotions that can come with conflicts, especially ones of this nature (emotion).

Results

Analysis of Participants' Performance of Intercultural Conflict Mediation

The first research question asked whether participants made any gains in their conflict mediation skills after participating in two class sessions focusing on intercultural conflict mediation. Table 3 presents descriptive statistics of pre- and post-test scores for all five dimensions. The Wilcoxon signed ranked test revealed a significant difference between the pre and post-test overall score, $Z = .397$, $p = .0001$, with large effect size ($r = 0.85$), indicating that the participants made a large improvement after the instruction. The descriptive statistics show the mean score increase across all five dimensions assessed.

Table 3

Descriptive Statistics of Test Scores

		Mean	*SD*	**95%CI [lower; upper]**
Pre-test	Initiative	2.61	0.90	2.23; 2.97
	Solution	1.84	0.86	1.48; 2.20
	Empathy	1.84	0.93	1.45; 2.23
	Perspective-taking	2.05	1.08	1.60; 2.50
	Clarity	2.82	0.99	2.41; 3.23
	OVERALL	11.16	3.31	9.78; 12.54
Post-test	Initiative	3.73	0.59	3.48; 3.98
	Solution	3.61	0.60	3.36; 3.86
	Empathy	3.30	0.90	2.92; 3.68
	Perspective-taking	3.57	0.79	3.20; 3.86
	Clarity	3.72	0.67	3.46; 3.98
	OVERALL	17.93	2.68	16.81; 19.05

Note. $N = 22$. CI = confidence interval. Each dimension was rated on a four-point scale, ranging from 1 to 4 (see Table 2). Range for the total score: 4–20.

The dimensions of Initiative and Clarity showed the highest scores both at pre- and post-test, while major pre-post differences were found in discourse organization and degree of involvement. At pre-test, several participants appeared rather distant from the situation, leading to low scores in Initiative, because of the

monotonous tone used while mediating the conflict. This is illustrated in Excerpt 1 below (pre-test). The pre-test scenario involved a German student (Kat) and a Japanese student (Misako) having an argument over class participation (see the Method section). The German student wants the Japanese student to contribute more to a group discussion, while the Japanese student prefers to remain quiet and take notes. Participant #8 objectively presented her observation of the conflict situation and contrasting perspectives between Kat and Misako. She concluded that it is "interesting to see" their perspectives, giving impressions that she was rather detached from the situation. Her initiative was rated as 2 by both raters (*"The participant initiated the mediation, but was not very active"*; see Table 2).

Excerpt 1

Participant #8, pre-test

> *Uh, it seems like you have a misunderstanding. Uh, as she said, in Japan it's not normal for students to talk, um, they're more there to listen to lectures, so this is kind of a different experience for her, and you should kind of adapt to that. Um, but, he's trying to tell you that the class isn't about being correct, or just about learning, it's about putting in your perspective. And you don't have to be right, um, it's just interesting to see what your perspective is. So I think if you guys kind of keep that in mind, you'll have a better connection.*

However, the same participant showed greater involvement at post-test, where she mediated a conflict between an American student (Andrew) and a Japanese student (Mika) over Andrew's tardiness in attending group project meetings. In Excerpt 2 below, we can immediately see her involvement in expressions such as *"Ok, I hear you guys"*, *"...let's figure out how we can…"*, and *"so let's make a plan…"* (underlined), which were absent in the pre-test. She also addressed the person by name ("Andrew") and asked a direct question (*"Is there a way that maybe we could move the time…?"*). Another notable trend is numerous instances of "we", which shows that the participant presented herself as part of the group. This in-group stance contributed to a sense of collaborative effort and engagement in the conflict situation.

Excerpt 2

Participant #8, post-test

> *<u>Ok, I hear you guys</u>. You're both very frustrated with this situation, <u>so let's figure out</u> how <u>we</u> can make this work out for everyone. <u>We</u> want to get this project done, and <u>we</u> want to get the group going strong. <u>Andrew</u>, she, they're expressing that they can't start because they want you to be here so you know what's going on… As for the group meetings, uh, it would be nice if you could come on time. <u>Is there a way that</u> maybe <u>we</u> could move the time or the day so it'd be easier for you to show up on time so the group can work together?... <u>So let's make a plan</u> to talk about perhaps other times that would work better for the group so everyone can be here on time so you guys can discuss together about the project, and then you can start working on your individual parts of it.*

The largest pre-post gain was observed on the dimension of Solution. At pre-test, the mean score was 1.84, which means that, according to the rubric (Table 2), the solution presented was vague and lacking details and focus. After two sessions of training on conflict mediation, the participants' average score more than doubled, jumping to 3.61 (out of 4.00). They became able to present a solution with a sufficient amount of support and justification. Specifically, they were able to present a convincing argument explaining why their suggestion is worth considering. The following excerpts from pre- and post-test performance illustrate this. At pre-test, the solution that Participant #10 presented was to have something in writing, which appeared unclear as a suggestion, leading to the score of 1.0. More importantly, the participant's solution did not help bring the two individuals in conflict together; instead, she focused on how to get things done on their own without compromising each other's process.

Excerpt 3

Participant #10, Pre-test

> *I think you both are coming at this with a different set of experiences, which might make it sort of hard to complete the assignment. Maybe we could figure out a way where we could both have something written down or said so we feel like we are each getting the assignment done but in our own ways.*

The way this participant presented a solution changed drastically at post-test. As shown in Excerpt 4 below, while she acknowledged that people prefer different ways of contributing to group work (same with the pre-test), she also emphasized cooperation as a fundamental benefit for group work. Then, she gave a concrete suggestion to achieve collaborative efforts to each participant: Andrew should communicate with group members if he is coming late; Mika should not dismiss Andrew just because he is late. Critically, the phrase "work together" appeared four times while presenting the solution, which helped highlight the importance of collaboration, compromise, and common-ground building to accomplish a group project. This performance received a full score of 4.0 from both raters.

Excerpt 4

Participant #10, Post-test

> *I think what you both really want is for this group to work well together and to feel like each of you are contributing in the way that you want. So with that in mind, I think the best thing might be if we can sort of figure out, well so for Andrew, it seems like it's going to be very important that you come in at the right time so that you can all work together, and maybe if you're at all not able to come in, to still communicate. If maybe you can share numbers or something. And for you [Mika] I think it's important that you kind of work with Andrew rather than just kind of dismissing based off the way he's acting. Even though I can see that it's really upsetting and that it's getting in the way, but that's not his intention. In the end, I just really think we can all work together and figure this out 'cause we both want what's best. So, let's work on it together.*

The stance toward common-ground seeking was also prominent in the dimension of Perspective-taking. Perspective-taking addressed whether participants were able to explain both parties' perspectives explicitly while acknowledging cultural values behind their perspectives. At pre-test, the overall mean score was 2.05, meaning that they addressed the individuals' perspectives only sparsely or they focused on one party's perspective (not both). The mean score increased to 3.57 at post-test. As shown in Excerpt 3 above, before the instruction, Participant #10 only mentioned that the problem occurred due to individuals' different experiences, but did not specify the actual experiences, so the mediation ended up receiving a score of 1. However, after the instruction, this participant became able to verbalize each person's perspective. As Excerpt 5 illustrates, she acknowledged Andrew's view that each group member has individual responsibility while emphasizing the importance of group responsibility. She also identified with Mika, acknowledging why she might feel that Andrew is not contributing to the teamwork; at the same time, she defends Andrew for the care he demonstrates for the group. She presented a balanced interpretation of the problem at hand and tried to facilitate mutual understanding between Andrew and Mika.

Excerpt 5

Participant #10, post-test

> *So Andrew, I know that it seems like there's a lot being put on you and that the group isn't working on their own even though you can see that all of you in the group have an individual responsibility, but there's also a group responsibility. In the end this is a group project, so I think what the rest of the group is wanting is to really work together as a team and to make sure that you are always a piece of that. But at the same time, I can also fully understand that you've got your own life and maybe you're*

not always able to come in on time, but it's really important for this project that you're an active part of the group. I think also, I can see why you guys (Mika and the other Japanese students in the group) are thinking that maybe Andrew isn't putting in the effort to be part of this group, but I think he's showing that he really does care a lot.

This excerpt illustrates that the participant's perspective-taking was grounded in her goal of establishing mutual information and knowledge. By explicating both sides of the issue, she was trying to incorporate perspectives of the people in conflict into each other's mental states so the people can develop mutual understanding, leading to conflict resolution.

Another notable trend found in the perspective-taking performance was a number of emphatic expressions used to support people's viewpoints. In Excerpt 5 above, we can find exemplary expressions such as *"I know that…"*, *"I can also fully understand that…"*, and *"I can see why you guys… are thinking that…"*. By using these expressions, this participant showed compassion toward the individuals in conflict, signaling that she can relate to both sides. Other forms of empathy were found at post-test. For example, Participant #11 explicitly recognized the frustration felt among the individuals (*"We are all frustrated for very understandable reasons."*). The use of these expressions was reflected in the mean score of 3.30 for the Empathy dimension at post-test, which increased by more than one full point from the pre-test.

Analysis of Participants' Perceptions of the VR Task

The previous section showed that the participants significantly improved their conflict mediation skills as assessed using the VR task. This section addresses the second research question, that is, the participants' perceptions of the task. Participants' responses to the open-ended survey question (i.e., *What did you think about the VR task?*) were coded and categorized thematically to discern notable patterns (see Data Analysis).

Overwhelmingly, the participants commented on a sense of virtual presence, or what Shultze and Leahy (2009) call *telepresence*—the feeling that one is actually part of the world they are experiencing. A total of 17 unique comments (of 22 participants) were identified around this theme in the survey responses. Notably, the sense of being part of the environment and embodiment prompted them to step into the ongoing argument and mediate the conflict at hand. The following excerpts illustrate the level of telepresence evoked in the virtual space. Participant #3 reported that he felt being part of the situation, rather than imagining it, and felt an urge to intervene to resolve the problem (Excerpt 6). Adding to this, Participant #1 reported that the immersive space served as a motivator, prompting her to step in and act as a mediator (Excerpt 7).

Excerpt 6

Participant #3

I think through the VR task, it brings me more into the situation than just reading it and trying to imagine in my mind. I can feel like I'm someone in the scenario, which helps me push myself to come up with a solution, or at least something I can say to offer help. I do enjoy the experience through the VR task, it's interesting and helpful.

Excerpt 7

Participant #1

The way the VR recording is set up, I do feel like a bystander motivated to step in and mediate, which helps a lot as far as motivation.

Interestingly, the participants' urge to initiate a mediation was caused by the emotions provoked in the immersive space. As illustrated in Excerpts 8 and 9, Participants #8 and #13 felt uncomfortable being in the middle of the virtual conflict, which provoked similar emotions as in a real-life conflict situation. These instances indicate that the participants' sensory systems became stimulated in the VR space, leading to an embodied experience.

Excerpt 8

Participant #8

> *It is surprisingly lifelike, I get the same feeling of slight discomfort in the VR as I do when dealing with real-life conflict. I think that means it is a great tool.*

Excerpt 9

Participant #13

> *Personally, I feel very uncomfortable around conflict situations and the VR environment induced the same emotions I experience in the outside world when I am faced with conflict or faced with mediating a conflict.*

The participants also felt tension while observing the conflict, as illustrated in the comments such as: *"The argument got really heated this time"* (Participant #4) and *"They were getting quite heated, and I felt very uncomfortable as if I were there"* (Participant #7). Participant #6 also commented on the intensity of the situation, which made the task more realistic than just responding to a written scenario (Excerpt 10). Participant #21 even mentioned that she wanted to "flee the classroom" because she felt so uncomfortable (Excerpt 11).

Excerpt 10

Participant #6

> *It is better than just reading a piece of paper with a scenario on it because it actually demonstrates the intense emotions that can come with conflicts, especially ones of this nature.*

Excerpt 11

Participant #21

> *I wanted to flee the classroom and let the students handle things themselves.*

While these comments demonstrate that the argument displayed in the task was realistic, one participant commented on the 'virtual' aspect of the task (Excerpt 12). She mentioned that, despite the lifelike feel that was present in the task, after all, the task was still a simulation, not a reality. As a result, she felt removed from the real-life emotions such as anxiety or stress that are likely to arise in a real conflict, which in turn helped her focus on applying the knowledge and skills she learned in class so she could mediate the conflict successfully:

Excerpt 12

Participant #11

> *The VR task is quite interesting for working on these problems because it gives the listener the feel of being in the room and seeing the people in the conflict instead of just reading about it, but removes the pressure from dealing with people who are actually angry and allows the person to give a more accurate answer and actually work on the skills instead of being placed in them and dealing with the anxiety on top of trying to defuse a situation.*

Finally, three participants observed that the format of the task was not realistic. Since this study used pre-recorded conflict scenes acted out by people, the participants only observed the conflict in 360-degree videos and talked to the people in the video in the frozen mode. As a result, their mediation was one-directional without any interaction. As illustrated in Excerpt 13, Participant #7 mentioned that the task was

not realistic without verbal or non-verbal reactions coming from people they were speaking to.

Excerpt 13

Participant #7

> *It was quite an interesting opportunity to witness a conflict like this. They were getting quite heated, and I felt very uncomfortable as if I was there. It is a little strange and unrealistic, though (not a criticism since this does not have an easy solution haha), since they stand there and stare at you while you talk, whereas in real life you would be able to evaluate their body language or they would be able to communicate with you as you mediate.*

As this comment illustrates, while the immersive surrounding gave an authentic feel and a sense of embodiment to the participants, lack of interaction and one-directional speech made the task less authentic.

Discussion

This preliminary study, which was conducted as part of the existing course, developed an intercultural conflict mediation task using 360-degree VR videos. The study explored whether the VR task was able to elicit a performance reflecting the key dimensions of intercultural success based on Van Oudenhoven and Van der Zee (2000) (social initiative, solution, empathy, perspective-taking, and clarity) and whether participants' performance changed on those dimensions after they learned conflict mediation skills. The study also examined participants' perceptions of the VR task as a tool to assess conflict mediation in intercultural settings.

While this study was a preliminary attempt, results clearly showed that the participants were able to follow the conflict displayed in the 360-degree video and tried to resolve it even before the instruction sessions. When the video froze, essentially all participants spoke to the individuals in conflict, and no one remained silent. Yet, the quality of mediation changed after the instruction, as demonstrated in the large score increase across all five dimensions. The participants demonstrated active listening by attending closely to what others were saying and verbalized their understanding of both sides of an issue using empathetic language. They also actively sought common ground among individuals in conflict and generated a tangible solution that was mutually acceptable to them.

These skills that the participants demonstrated closely align with the construct of intercultural conflict competence (Ting-Toomey, 2012) and strategies of conflict mediation outlined by Jackson (2020). Also, these skills reflect common traits of intercultural competence identified in the literature, including perspective-taking, empathy, flexibility, openness, and emotional stability (e.g., Byram, 2012; Fantini, 2012; Van Oudenhoven & Van der Zee, 2001). The participants' performance data during the virtual mediation were characteristic of these traits and skills. Involvement and initiative were observed in their use of in-group language (e.g., the use of inclusive "we" and suggestions marked with "Let's"), while empathy was observed in the expressions of understanding and compassion (e.g., *"I understand that…"*, *"I totally see that…"*). In addition, while not in the assessment criteria, the participants' gestures indicated their involvement as a conflict mediator. Although we did not perform multimodal transcription of the data, video-recordings of participants' performance displayed their constant head movement turning from one side to the other while listening to the people's arguments. Active hand gestures were also observed when they were talking to the people in the 360-degree video.

These signs of involvement and initiative found in the data indicate the potential usefulness of the immersive VR technology when applied to assess intercultural competence. Since existing measures are overwhelmingly questionnaire-based, assessing participants' perceived behaviors (not actual behaviors) (Fantini, 2006; Griffith et al., 2016), the current measure assessing skills of conflict mediation in intercultural settings adds to the small body of performance-based assessment approaches in the field (e.g., INCA, 2004). Adopting the theoretically motivated strategies of intercultural conflict mediation (Jackson,

2020; Ting-Toomey, 2012) and traits of intercultural competence (Van der Zee & Van Odenhoven, 2000) as assessment criteria, the current measure demonstrated that the core constructs of intercultural competence, such as perspective-taking, cultural empathy, social initiative, and emotional stability, can be indeed elicited and observed in performance, and evaluated accordingly.

Critically, the VR technology helped to enhance the ecological validity of the performance-based measure, replicating intercultural conflict settings which were not easily experienced in real-life situations. Simulations in the virtual space helped participants gain hands-on experience in conflict mediation, which are likely to transfer to real-life settings. The correspondence between the laboratory experience and authentic experience was supported by the participants' survey responses. The immersive nature of the VR task led to the feel of being part of the environment as seen in their comments such as "lifelike", "realistic", and "the feel of being in the room". The immersive, embodied experience created in the virtual space was also evident in the feeling and senses reported by the participants. While observing the virtual conflict, they felt "uncomfortable", "intense", and "heated" as if they were in a real-life situation. Having these emotions, the participants were compelled to step in and mediate the conflict they were facing. These findings further support the benefit of immersive VR for intercultural learning. The virtual simulations can evoke specific feelings (e.g., discomfort) similar to those of real-life intercultural settings, which in turn prompt participants to put learned mediation skills into practice. These findings confirm existing findings that VR users have emotional responses that are comparable to affective experiences in the real world (Scanlon & Castaneda, 2018).

As Li et al. (2020) claim, motivation to learn about other cultures can be boosted through reproductions of cultural scenes. Replication of first-hand experiences can cultivate participants' curiosity and interest in other cultures in a way that they are prompted to engage in behavior aimed at intercultural learning. Because VR technology can produce realistic environments, it provides participants with opportunities for situated learning experiences. Realistic experiences can induce what Mills et al. (2020) call "actional immersion", in which participants are prompted to "initiate actions that have novel, intriguing consequences" (p. 6). In the present study, the actional immersion was observed in participants' verbal output for conflict mediation.

While the approximation of a real-life experience was clearly present in the current VR task, it is important to note that one participant explicitly commented on the virtual nature of the task. She mentioned that, since the task was a mock practice of a real situation, she was able to focus on using skills and strategies she learned in class, rather than feeling too anxious and overwhelmed to use them as in an actual conflict situation. Her comment indicates that the virtual reality is only realistic, and it is not real. At the same time, it reveals the educational value of the task. The VR simulation provides an opportunity to practice learned knowledge and skills, which could eventually contribute to participants' transfer of learning to real-life situations.

In summary, the present findings support the existing literature on the benefits of immersive VR for developing intercultural competence. Existing studies have used 360-degree videos to create opportunities to observe cultural practices, to interact with people from different cultures, and to engage in intercultural joint projects (Akdere et al., 2021; Li et al., 2020; Shadiev et al., 2020; Song, 2019). Using survey and interview data, these studies have revealed students' gains in cultural awareness, curiosity, interest, intercultural sensitivity, and perceived confidence in intercultural engagement. These findings, along with the present findings, indicate that a sense of presence and a direct participatory experience generated in a virtual space can promote intercultural learning, which is otherwise difficult to replicate in real-life settings. Participants are directly placed in a situation where cultural differences are visible and asked to act on the differences. Going beyond the existing studies that have used indirect measures (e.g., surveys and interviews) to assess the efficacy of VR-based tasks, the present study captured the participants' action while engaging in culturally-charged conflict situations. The various performance features revealed in the analysis provided direct evidence of intercultural learning.

Limitations and Future Directions

This study has several limitations that should be addressed in future research. First and foremost, the preliminary nature of the study needs to be improved with a larger sample size with diverse participant backgrounds. Since this study was conducted in an intact class, there were only 22 participants who were mostly female students from the U.S.A. Future research can expand on the participant pool in terms of both number and nationality. Given the focus of the study involving intercultural learning, participants from diverse cultural backgrounds could add to the quality of investigation. Adding to this point, the concept of 'target culture' should be fine-tuned in future research. This study used conflict situations between a Japanese and an American student primarily because of the pilot survey data that was available prior to the study (see the Method section). However, it is questionable whether those cultural scenarios were relevant to the current participant group. Future research should conduct needs analyses to determine which cultures are most meaningful for participants to learn about and develop materials accordingly.

Another limitation of the study relates to the format of the VR task. As several participants mentioned, the lack of interaction in the virtual space was awkward and strange. In the current task, the 360-degree video froze after displaying the conflict, and then participants were asked to respond to the people who remained frozen for the entire time and were not able to speak back. Without using advanced technology such as artificial intelligence and automatic speech recognition, it is nearly impossible to create an interactive task of the current focus (conflict mediation). A potential solution to this problem is to create a social VR platform so participants can observe and mediate a live conflict. We can have avatars of different cultural backgrounds perform a conflict, and participants can interact with them during their mediation. While this format is more time-consuming and less practical than the present task, it can facilitate a greater degree of engagement in intercultural encounters. By adding interactions to VR simulations, future research can further promote the often-cited benefits of immersive VR such as authenticity, feeling of presence, and embodied experience that have been revealed in this study and elsewhere in the literature.

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Appendix. VR Task Prompts

Instructions: This session will be video-recorded. You will put on a VR headset and watch a short video involving two people talking. Imagine that you know them well and you happen to be there. When the video stops, you can talk to them. When you are done, take off the VR headset.

Pre-test

This scenario reflects a problem between Misako, a Japanese student, and her classmate, Kat, from Germany. Read the background and perspectives of Misako and Kat.

Background: Misako is a Japanese student at an English-medium university. She is an engineering major but is currently taking a class in European history, which she has never studied before. Half of the students in the class are Japanese. The other half are European, Australian, or American. The class watched a video on the fall of the Berlin Wall in 1989. After that, Misako and two other Japanese students were placed in a group with Kat, a student from Germany. The professor asked the group to discuss the video, and then find the three most important ideas to submit as group homework.

Misako's perspective: In my high school, we didn't study much European history so I was a little nervous to take the class. I am interested but my spoken English isn't great. Also, in Japan, most classes are lectures, and students just listen and take notes. We do not speak. Kat was very friendly when we first formed the group. He said, "I grew up with this history. My parents were in West Berlin when the wall fell. I know a lot about it and can help with any questions!" We were silent. Finally, Kat said, "What do you think is the most important idea?" I was not confident that I had the right answer and it was embarrassing to say "I don't know." Since Kat knew the subject, he should be the one to find the important ideas for the group. Finally, Kat said, "Fine, I'll tell you what was most important." I wrote down what he said. But at the end he seemed really upset. He said, "If you don't participate, there's no reason to discuss!"

Kat's perspective: I grew up learning about European history. I took this class so I could hear what other students, especially the Japanese students, think about important changes from my part of the world. But they don't really talk in class. They just listen to the professor and take notes. I was really excited when the professor showed the Berlin Wall video because my parents were there. They never stopped talking about it when I was growing up! But when I offered to share the story with the Japanese students they just said, "That's nice." What does that mean? Did they want to hear more or not? So I asked them what they thought about the video. But they didn't say anything. So finally I just told them what I thought. They acted like I was the professor and wrote down what I said. But I'm not a professor, I'm a student, and I want to know what other students think.

Post-test

This scenario reflects a problem between Mika, a Japanese student, and his classmate, Andrew, from U.S.A. Read the background and perspectives of Mika and Andrew.

Background: Mika is studying information technology at an international university in Japan. There are many group projects in the class. In his current project, the professor made groups of four students and asked them to come up with an idea for an app to help with class scheduling. Mika has been placed into a group with two other Japanese students and with Andrew, an American student from New York City. The group has met 4 times so far, but they have not made much progress on their assignment.

Mika's perspective: Information technology is a very important class for me, but the experience has been frustrating. There are a couple of American students who often come in late. They don't apologize or say sorry to the professor; they just sneak in the back and sit down. So I was not excited to have Andrew in my group. At the beginning, we all said, "This group project is very important for our grade." And then we

made a list of tasks we would each do. But Andrew has come late for three of our meetings. He doesn't seem to recognize that he is holding up the group. The rest of us don't want to leave him out of the discussion, but if he doesn't want to be part of the group he should ask the professor to switch. In the meantime we just sit there waiting for him to show up.

Andrew's perspective: Being in Japan for college is a big change, even though everyone speaks English. A lot of things get lost between cultures. For example, if I'm running late to class, I try to come in as quietly as possible and just find the nearest seat in the back. It's not ideal, but better to go to some of class than to miss the whole thing. In American schools, we were all responsible for our own work, even when it was a group project. When our group first met to discuss the app project, we decided on different responsibilities. I feel that, if someone is taking care of their responsibilities, that's all that matters. But the Japanese students act like they can't do anything unless I'm there to get them started. If I'm running late, they just sit there and check their phones until I show up. It's like none of them want to take responsibility.

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