



European J. of International Management

ISSN online: 1751-6765 - ISSN print: 1751-6757

<https://www.inderscience.com/ejim>

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DOI: [10.1504/EJIM.2023.10057603](https://doi.org/10.1504/EJIM.2023.10057603)

Article History:

Received:	26 August 2022
Last revised:	10 March 2023
Accepted:	14 March 2023
Published online:	23 June 2025

Team climate and performance in global virtual teams: exploring the effects of cultural intelligence and emotional intelligence on team climate satisfaction

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Abstract: The literature has largely overlooked the role of multiple intelligences in Global Virtual Teams (GVTs). Based on a global data set including 723 individuals from 37 countries working in 218 GVTs, the present study aims to explore the impact of emotional intelligence (EQ) and cultural intelligence (CQ) on improving team climate satisfaction and, in turn, the effect of team climate satisfaction on the performance in GVTs. The multilevel analysis results show that team climate satisfaction mediates the effects of EQ and CQ on performance in GVTs. At the individual level, team members' satisfaction with the team climate negatively mediates the relationship between team members' EQ and CQ and their performance in GVTs. In contrast, at the team level, the average team climate satisfaction positively mediates the relationship between the average EQ and CQ of team members and the collective performance in GVTs. We discuss the implications for research and practice.

Keywords: global virtual teams; cultural intelligence; emotional intelligence; performance; team climate satisfaction.

Reference to this paper should be made as follows: Davaei, M., Gunkel, M. and Taras, V. (2025) 'Team climate and performance in global virtual teams: exploring the effects of cultural intelligence and emotional intelligence on team climate satisfaction', *European J. International Management*, Vol. 26, Nos. 3/4, pp.565–594.

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This paper is a revised and expanded version of a paper entitled 'The role of multiple intelligences in promoting team climate and its' performance outcomes in global virtual teams' presented at 'AIB Annual Meeting' Miami, USA, 6–9 July 2022; 'EURAM Conference in Winterthur/Zurich', Switzerland, 15–17 June 2022; and '47th EIBA Annual Conference' Madrid, Spain, 10–12 December 2021.

1 Introduction

To accommodate the accelerating pace of globalisation, an increasing number of multinational organisations structure their work using multicultural teams (Groves and Feyerherm, 2011). The virtual team format has become a prevalent practice for dealing with the demands of globalisation and increasing interconnectivity between cultures (Gibson and Cohen, 2003; Nydegger and Nydegger, 2010), and organisations are expected to rely increasingly on 'temporary, culturally diverse, geographically dispersed and electronically communicating workgroup[s]' (Jarvenpaa and Leidner, 1999, p.792), referred to as Global Virtual Teams (GVTs). The COVID-19 pandemic prompted a

further shift to telework and virtual meetings in lieu of international business travel. For example, in 2020, about half of the employees in the USA were working remotely, compared to only 15% right before the pandemic (Brynjolfsson et al., 2020). It is expected that many companies, which have shifted to virtual work during the COVID-19 pandemic, will keep remote working as an option for their employees even after the pandemic (Bartik et al., 2020). Therefore, it is essential to identify and improve the factors and processes that influence GVTs' performance.

Teams with diverse cultural backgrounds, especially those working virtually, may lack a shared perception of events, practices and procedures (Anderson and West, 1998). The shared perception of the team members towards the work environment has been defined as team climate, which impels them to trust each other and to cooperate and achieve the team goals together (West and Anderson, 1996). Team climate has an essential role in uncertain or non-routine situations, like GVTs, because the social cues of team climate provide directions for the team members' efforts (Maruping and Magni, 2012). Thus, developing a positive team climate in GVTs can be critically important for team performance. However, team climate is unique in GVTs due to the communication and collaboration difficulties of working in a multicultural virtual context (Cordes, 2017). GVTs face unique obstacles to effective communication and collaboration (Tavoletti et al., 2023) that affect the development of a positive team climate and performance. First, they depend on technology-mediated communication that lacks verbal and nonverbal emotional signals, which are clearly present in face-to-face teams. This may influence effective communication (Martins et al., 2004) and subsequently hinder the promotion of a positive team climate and effective performance in GVTs. Emotional intelligence (EQ), the ability to identify, comprehend and regulate one's and other's emotions (Mayer et al., 2008), has been proposed to facilitate effective communication in a virtual team environment (Pitts et al., 2012). Second, cultural diversity, as an inherent feature of GVTs (Gibson and Gibbs, 2006), increases the complexity of team member relations and collaboration dynamics (Pauleen, 2004) and affects team processes and outcomes (Gibbs et al., 2017). Intercultural abilities pertaining to the sensitivity and handling of cultural heterogeneity of GVT members, such as Cultural Intelligence (CQ), have been suggested as crucial competencies for working in GVTs (Hertel et al., 2006).

Further, cultural diversity in multicultural teams may lead to a diversity of ways in which GVT members express and understand emotions, causing tension and apprehension among them (Schellwies, 2015). Thus, EQ may also help manage negative emotions and improve team members' satisfaction with the team climate in GVTs. Although past research has demonstrated the impact of EQ on promoting team climate in homogeneous face-to-face teams (e.g., Pirola-Merlo et al., 2002) or virtual teams (e.g., Gamero et al., 2021), as well as has investigated the relation between CQ and team climate in multicultural teams (e.g., Sağ et al., 2016), to our knowledge, these relationships have not been investigated in a single study and the GVT context. Particularly, previous studies have seldom examined EQ in multicultural contexts (Davaei and Gunkel, 2023), and much focus has been given to the significance of CQ as a critical ability for GVT members (Henderson et al., 2018; Presbitero, 2021). Although in prior research, much attention has been paid to the EQ as a driver of team effectiveness in domestic face-to-face teams (e.g., Ashkanasy, 2003; Nelis et al., 2009), research has yet to address it in GVTs in detail (Davaei and Gunkel, 2023; Lepsinger and

DeRosa, 2010). Table 1 summarises prior research on the role of EQ and CQ in promoting team climate in teams and the research gaps we intend to address in the present study.

This study intends to provide insights into the impact of EQ and CQ on increasing team climate satisfaction and, subsequently, on the performance in GVTs. According to the theory of multiple intelligences (Gardner, 1983), every human possesses distinct intelligences. Individuals require a blend of different forms of intelligence to perform effectively in a particular organisational setting. For example, Davaei et al. (2022) suggested that in GVTs, team members' EQ and CQ reduce intragroup conflicts, which in turn, improves team performance. Building on Gardner's (1983) theory of multiple intelligences, our basic argument is that to perform well in GVTs, increasing team members' satisfaction with team climate is necessary and various types of social intelligence, like EQ and CQ, may form such team climate satisfaction.

Table 1 Summary of past research and the research gaps

<i>Summary of past research</i>	<i>The research gaps</i>
The importance of EQ in virtual teams, as well as domestic face-to-face teams (e.g., Ashkanasy, 2003; Cole et al., 2016)	The role of EQ in multicultural teams (Davaei and Gunkel, 2023; Lepsinger and DeRosa, 2010)
The EQ-team climate relationship in homogeneous face-to-face teams (e.g., Pirola-Merlo et al., 2002)	The EQ-team climate relationship has rarely been examined in multicultural contexts
The EQ-team climate relationship in virtual teams (e.g., Gamero et al., 2021)	The EQ-team climate relationship and the CQ-team climate relationship have not been examined in a single study
The CQ-team climate relationship in multicultural teams (e.g., Sağ et al., 2016)	

To examine the impact of EQ and CQ on team climate satisfaction and the performance consequences of team climate satisfaction in GVTs, we present a multilevel empirical study using a sample of 723 individuals, forming 218 GVTs with team members from 37 countries. The findings enhance the literature on the international human resources management by examining the importance of multiple intelligences in GVTs as key competencies impacting team climate satisfaction and performance in such teams. While the existing research on team climate development and GVTs' performance has mostly examined the impact of only one type of intelligence in a single study, the present study highlights the significance of examining EQ and CQ at once in the multicultural GVT context. Furthermore, this study highlights the importance of team climate satisfaction as a mediator between EQ and CQ and performance in GVTs. The multilevel model presented in this study investigates this mediation effect at both individual and team levels.

Throughout the paper, the term team climate satisfaction means *team members' satisfaction with a team climate* of trust, openness for linguistic diversity, information elaboration, and team learning behaviour. In the remainder of the article, we, first, present our theoretical framework and advance our hypotheses. Then, we describe the research methods deployed and measures used to test the model. Next, we present the results of our analysis and conclude with a discussion of the implications of our findings, their limitations and directions for future research.

2 Theoretical background

2.1 Antecedents

Team climate: Team climate is defined as the perception of events, practices and procedures shared by team members (Anderson and West, 1998). Team climate indicates the team members' attitudes and behaviours (West and Richter, 2011) and is extensively known for understanding and evaluating a team's working environment. Individuals usually seek signals from their team environment to interpret events, develop attitudes and form expectations regarding their behaviours (Liao and Chuang, 2004). When applying the concept of team climate, it is crucial to define the particular facets of the team climate construct according to the expected types of workgroup behaviour and outcomes (Rousseau, 1988). For example, when the team climate is supposed to predict performance, team climate should encourage team members to engage in behaviours that foster effective performance. In GVTs, a team climate construct consisting of components such as team trust, openness for linguistic diversity, elaboration of task-relevant information and team learning behaviour could be a predictor of effective performance.

Team trust is one of the key factors affecting individuals' interactions and various organisational outcomes (Mayer et al., 1995). It enables cooperation and reduces complexity even in uncertain working situations (Luthans, 1992), like GVTs. Indeed, teams with a high level of trust are more likely to handle the virtual environment's uncertainty, complexity, and expectations than those with a low level of trust (Jarvenpaa et al., 1998; Jarvenpaa and Leidner, 1999). Furthermore, according to previous research, trust is essential to virtual teams' performance (Kardell et al., 2023; Pinjani and Palvia, 2013; Sarker et al., 2011). In GVTs, trust is particularly salient due to the added challenges of working in a global and culturally diverse work environment (Jarvenpaa and Leidner, 1999; Jarvenpaa et al., 2004). In fact, 'trust is the glue of the global workspace, and technology does not do much to create relationships' (O'Hara-Devereaux and Johansen, 1994). Trust is important in GVTs, as a GVT context makes other forms of social control, like direct supervision, infeasible (Jarvenpaa et al., 1998).

Language differences in GVTs often cause social categorisation and biases, which could result in conflicts within groups (Barner-Rasmussen and Aarnio, 2011; Welch and Welch, 2008). A team climate for diversity has been found to alleviate bias, conflict and other social categorisation problems leading to constructive group outcomes and effective performance (Gonzalez and DeNisi, 2009). Openness to linguistic diversity could be one of the essential team climate dimensions in GVTs. Linguistic diversity illustrates the communicative aspect of diversity (Jonsen et al., 2011), and openness to linguistic diversity represents the individuals' acceptance of each other's different language proficiency, vocabulary and accents (Lauring and Selmer, 2012). The paucity of tolerance to respect for these language variations could lead to foreign language anxiety, hampering individual performance in GVTs (Presbitero, 2020a).

The diversity in GVTs, increases the range of knowledge, opinions, perspectives, attitudes and skills, thus improving team decisions and performance (Jackson and Joshi, 2010; Van Knippenberg and Schippers, 2007). Information sharing has been suggested to play a significant role in GVTs' success (e.g., Kardell et al., 2023; Rafaeli and Ravid, 2003). However, to make more qualified decisions and achieve better performance, only the availability of information is not enough (Van Knippenberg et al., 2004), but also it

must be effectively discussed, elaborated and incorporated (Hoever et al. 2012; Van Knippenberg and Van Ginkel, 2010). Using verbal communication to exchange, discuss and incorporate information and perspectives is referred to as elaborating information (Meyer et al., 2011; Van Knippenberg et al., 2004). Previous studies demonstrate the importance of elaboration of task-relevant information in team decision quality (Van Ginkel et al., 2009) and team performance (e.g., Kearney and Gebert, 2009; Kearney et al., 2009; Van Ginkel and Van Knippenberg, 2008, 2009), particularly for teams working in complicated and dynamic environments (e.g., Homan et al., 2007, 2008), like GVTs. Thus, promoting a climate for the elaboration of task-relevant information in GVTs enables positive impacts of diversity by utilising a more comprehensive range of knowledge and perspectives (Homan et al., 2008; Van Knippenberg et al., 2004), a process that may explain why heterogeneous teams usually perform better than homogeneous ones (e.g., Nederveen-Pieterse et al., 2011; Van Knippenberg and Van Ginkel, 2010).

GVTs allow organisations to swiftly adapt to evolving business environments (Mulebeke and Zheng, 2006) and growing competition (Hunsaker and Hunsaker, 2008; Pauleen, 2003). To decide as quickly and efficiently as possible, such workgroups should be highly effective learning systems. They need to promote learning behaviours to achieve high-quality outcomes and survive in fast-changing business environments (Brodbeck, 1996; Edmondson, 2002; Kozlowski and Bell, 2008). Learning behaviour at the team level refers to a set of activities – like looking for feedback, information exchange, seeking advice, analysing mistakes and experimenting – performed by individuals through which a team acquires and analyses data that allows it to adapt and improve. These activities make learning happen at the team level. In other words, by learning activities, a team can recognise environmental changes, improve team members' shared understanding of a situation or explore any unanticipated effects of their prior actions (Edmondson, 1999). Promoting a team climate for learning is critical to stimulate and support team members in engaging in team learning behaviours (Crans et al., 2021). A team climate for learning is defined as team members' shared perception of the work environment that promotes or hinders learning in the team (Brodbeck, 2003; James et al., 2008). Previous research suggests that a team climate for learning is an essential predictor of team effectiveness and performance (Ramírez et al., 2014).

Therefore, a team climate of team trust, openness for linguistic diversity, elaboration of task-relevant information, and team learning behaviour could predict performance in GVTs.

Multiple intelligences theory: Intelligence is a term traditionally referred to the general, unitary faculty of intelligence or 'g' (Spearman, 1904) and is often used as a measure of cognitive functioning abilities, like 'the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience' (Gottfredson, 1997, p.13). Gardner (1983) proposed a multiple intelligences theory and challenged the conventional idea of the single measure of intelligence by claiming that individuals' cognitive ability is comprised of a set of abilities, talents or mental skills, referred to as intelligences (Gardner, 1993). This theory presents a pluralistic view of the mind, recognising various dimensions of human ability. According to Gardner's multiple intelligences theory (1983), there are, in fact, at least eight distinct intelligences – linguistic, mathematical, musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal and naturalistic – which 'all humans possess certain core abilities in each of the intelligences' (Gardner, 1993, p.28). Thus, individuals demonstrate an uneven profile of intelligences, such that each person has more potential

in certain intelligences. While the traditional view of intelligence believed that intelligence is predetermined and fixed and does not change over a lifetime, multiple intelligences theory suggests that some intelligences emerge at a very young age, like logical-mathematical, while others appear to arise more gradually and can improve throughout life such as personal intelligences (the interpersonal and intrapersonal intelligences) (Gardner, 1993). Intrapersonal intelligence refers to the ability to understand one's emotions, ideas, motivations and self-reflection and effectively use such information to regulate one's life (Gardner, 2006). People with intrapersonal intelligence tend to be prone to self-perception and control. In contrast, interpersonal intelligence is the ability to work cooperatively with others in a group and to communicate verbally and nonverbally with them (Stanford, 2003). Interpersonally intelligent individuals can detect others' moods, traits, feelings and intentions and use this information to tailor their interactions with them (Gardner, 2006). In the late 20th century, the research activity started focusing more on personal intelligences and its importance as a key factor in critical life outcomes (Mayer, 2009), particularly by introducing new concepts in intelligence research, like EQ (Salovey and Mayer, 1990) and CQ (Earley and Ang, 2003). The concepts of EQ and CQ are situated in the theoretical framework of multiple intelligences and are akin to what Gardner has termed personal intelligences. He, in fact, argues that by personal intelligences, he was actually referring to emotions (Goleman, 2008).

An increasing body of research emphasises the importance of EQ in workplace processes and outcomes (e.g., Cherniss and Goleman, 2001; Goleman, 1995, 1998; Wasylyshyn et al., 2006). According to Wasylyshyn (2010), more than 60% of the abilities considered essential to perform effectively are emotional abilities. EQ has a vital role in the interpersonal environment of organisations (Pittenger, 2015) and is usually viewed as a treatment for challenging interpersonal issues (Samiuddin et al., 2017). However, EQ is claimed to be culture-bound (e.g., Ang and Van Dyne, 2008), meaning that the behaviour of individuals resulting from EQ could be different in various cultural settings (Law et al., 2004). One may have high EQ in one's own culture but not when interacting with people from other cultural backgrounds. In fact, EQ is not specific to intercultural settings, and EQ alone can rarely resolve cross-cultural challenges. Therefore, EQ alone does not guarantee success, particularly in a culturally diverse GVT context. Studies show that CQ can help organisations reduce the obstacles arising from cultural diversity (Scholz, 2012). Prior research emphasises the importance of studying EQ and CQ together in multicultural environments (Davai et al., 2022). While related to each other (Davai et al., 2022), EQ and CQ are quite distinct constructs (Crowne, 2009; Moon, 2010; Schlaegel et al., 2021) and collectively facilitate interpersonal interactions in the GVT context. Therefore, EQ and CQ complement each other in a global context, leading to more effective interactions in cross-cultural settings.

2.2 Hypotheses

Individual level: Team members with higher EQ can better address the interpersonal challenges of virtual teamwork (Nauman et al., 2006) and support and respect one another, resulting in more satisfaction with the team climate (Luca and Tarricone, 2001; Pirola-Merlo et al., 2002). Moreover, in GVTs, there is a link between team outputs and team members' openness to diversity (Fujimoto et al., 2000). It is easier for culturally intelligent employees to analyse and adapt to the different cultures within the organisation. Therefore, they can perform more effectively than their less culturally

aware colleagues (Presbitero, 2016; Presbitero and Toledano, 2018; Presbitero, 2020b). Furthermore, previous research demonstrates the positive effects of CQ on team climate in GVTs (Baker et al., 2023; Sağ et al., 2016).

Team climate is a psychological construct, and it will be perceived and defined based on the views of individuals (James and McIntyre, 1996). Individuals with higher EQ and CQ scores are expected to have a more positive perceived team climate. That is, team members with high EQ and CQ will likely be more effective at building positive relationships with their team members. Thus, they will be more satisfied with the interactions within the team and subsequently will perceive and rate the team climate higher. Therefore, we hypothesise:

Hypothesis 1a: Team members' EQ is positively related to their satisfaction with the team climate in GVTs.

Hypothesis 1b: Team members' CQ is positively related to their satisfaction with the team climate in GVTs.

People respond to the work environment according to how they perceive it (James and McIntyre, 1996). In a team, each team member has a perception of the level of team climate, which 'has long been known as one of the most important sources of social influence that affects individual behaviour in the team environment' (Xue et al., 2011, p.300). Previous research shows that a positive perception of the team climate promotes performance in the team (e.g., Acuña et al., 2008; Agrell and Gustafson, 1994; Anderson and West, 1998; Colquitt et al., 2002; Marks et al., 2001). In fact, team climate satisfaction has been regarded as an antecedent variable of performance (Mumford et al., 2002; Rajnandini et al., 1999; Wiley, 2000). Therefore, we propose:

Hypothesis 2: Team members' satisfaction with the team climate is positively related to their performance in GVTs.

According to McGrath's (1984) input-process-output model, various input factors, including individual and environmental factors, are combined and affect the team interaction process. These team processes (e.g., team climate), in turn, influence the team output (e.g., performance). Based on this model, we assume that EQ and CQ, as individual input factors, impact individual performance through team climate satisfaction. Therefore, we examine whether team members' satisfaction with the team climate mediates the link between both EQ and CQ of team members and their performance. Hence, we propose:

Hypothesis 3a: Team members' satisfaction with the team climate positively mediates the relationship between the EQ of team members and their performance in GVTs.

Hypothesis 3b: Team members' satisfaction with the team climate positively mediates the relationship between the CQ of team members and their performance in GVTs.

Team level: Previous research has shown that the team's average EQ and CQ are related to team process effectiveness (e.g., Jordan et al., 2002). Thus, the concept of EQ and CQ should be viewed not only as individual competencies but also as critical group competencies for teams (Druskat and Wolff, 2001; Fang et al., 2018; Gelfand et al., 2008; Yari et al., 2020), helping to establish a positive team climate (Druskat and Wolff, 2001), which in turn, leads to better collective performance in teams (e.g., Agrell and Gustafson, 1994; Anderson and West, 1998; Colquitt et al., 2002; Marks et al., 2001). Therefore, we propose:

Hypothesis 4a: The average EQ within the team is positively related to the average team climate satisfaction in GVTs.

Hypothesis 4b: The average CQ within the team is positively related to the average team climate satisfaction in GVTs.

Hypothesis 5: The average team climate satisfaction within the team is positively related to collective performance in GVTs.

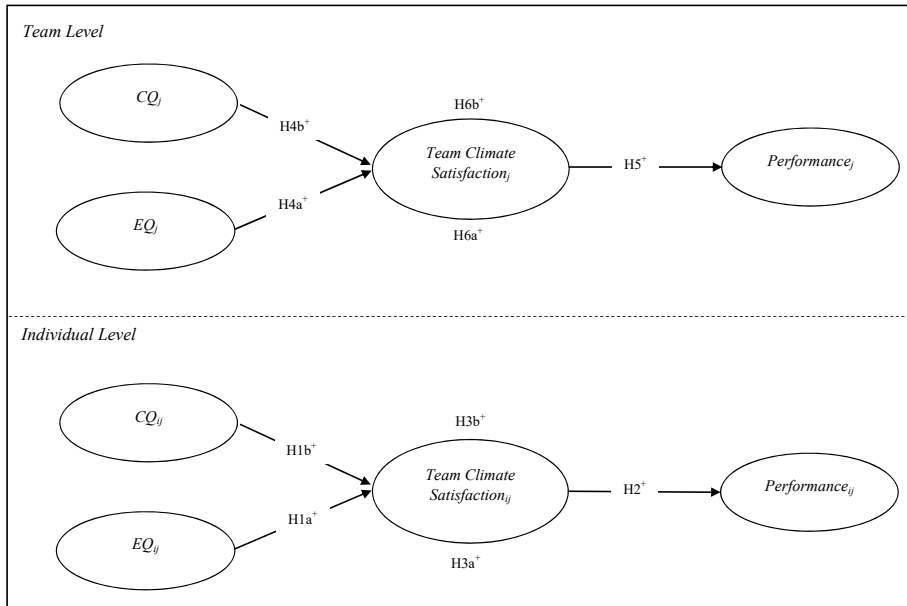
GVTs whose members, on average, have higher EQ and CQ scores will likely better navigate interpersonal issues in multicultural teams and, thus, have better relationships with team members and, subsequently, will be more satisfied with the team climate. The higher the satisfaction of the team members with the team climate, the higher the team performance. Therefore, we propose that the average team climate satisfaction within the team mediates the effect of group EQ and CQ on collective team performance. Thus, we hypothesise:

Hypothesis 6a: Average team climate satisfaction within the team positively mediates the relationship between the average EQ within the team and the collective performance in GVTs.

Hypothesis 6b: Average team climate satisfaction within the team positively mediates the relationship between the average CQ within the team and the collective performance in GVTs.

Figure 1 depicts the multilevel conceptual model of this study. Since all four variables have been assessed at the individual level, this model is described as a 1–1–1 multilevel model, investigating both within and between effects.

Figure 1 Conceptual model



3 Methodology

3.1 Sample and data collection

The data were collected as part of the X-Culture project, which is a virtual international business consulting project. Every semester, more than 5000 undergraduate and graduate business students from about 120 universities in 40 countries collaborate on this project. The participants propose solutions to an actual business challenge posed by real client companies. To do so, they work in GVTs for eight to nine weeks. During teamwork, individual and team performance is assessed constantly based on weekly deliverables, progress reports and peer evaluations. The team members evaluate various aspects of teamwork (such as team trust, team learning behaviour, conflict, etc.) every week and provide information about themselves by filling out intelligence tests, personality tests, and so on.

We used the data set from the second semester of 2018, comprising 1043 students, which is the most recent round of the competition when all constructs in our model were empirically measured. All participants who had left more than two items of each of the EQ, CQ and team climate satisfaction dimensions unanswered were removed from the sample. We also excluded all participants with a missing value for each control variable and performance. The final sample comprises 723 participants, working in 218 GVTs of four to six members, in which each member typically comes from a different country. 88.8% of participants are undergraduate students, while the rest are graduate students. 63.4% of participants have at least one year of work experience, and 29.7% have managerial experience. The average age in the sample is 22 years, and 60% are females. The participants come from 37 different countries.

The sample's demographic details are shown in Table 2.

Table 2 Individuals' demographic characteristics

<i>Demographic data</i>	<i>Frequencies (n= 723)</i>	<i>Percentage</i>
<i>Gender</i>		
Female	434	60.0%
Male	289	40.0%
<i>Age</i>		
25 and less	648	89.6%
26–30	50	6.9%
31 and more	25	3.5%
<i>Education</i>		
Graduate	81	11.2%
Undergraduate	642	88.8%
<i>Work experience</i>		
Never had a job	132	18.3%
0–6 months	132	18.3%
1 year	123	17.0%
2–3 years	139	19.2%
4–6 years	129	17.8%
7–10 years	37	5.1%
More than 10 years	31	4.3%

Table 2 Individuals' demographic characteristics (continued)

<i>Demographic data</i>	<i>Frequencies (n= 723)</i>	<i>Percentage</i>
<i>Managerial experience</i>		
Never worked as a supervisor	508	70.3%
Supervised 1–2 people	110	15.2%
Supervised 5–10 people	70	9.7%
Supervised 10–20 people	29	4.0%
Had their own business with more than five permanent employees on the payroll	6	0.8%

3.2 Methods

Before testing the research hypotheses, to ensure the robustness of the measures, a Confirmatory Factor Analysis (CFA) using *R* (Version 4.0.2) and SPSS was performed for EQ, CQ, and team climate satisfaction measures separately. We used Multilevel Structural Equation Modelling (MSEM) to test the research hypotheses. This method is suggested when dealing with two-level latent variables (Klein and Kozlowski, 2000; MacKinnon, 2008; Sophia et al., 2007), as it allows the examination of complex relationships between latent variables at individual and team levels (Hox et al., 2010; Muthén, 1994; Snijders and Bosker, 2011). The data were analysed using Mplus (Version 8.3).

The goodness of the measurement model was assessed through convergent and discriminant validity. To establish convergent validity, we examined Cronbach's alpha (α), Composite Reliability (CR) and Average Variance Extracted (AVE). As demonstrated in Table 3, each construct's items are good measures due to the high convergent validity indicated by the Cronbach's Alpha and CR indexes greater than .70 and .60, respectively. The AVE of team climate satisfaction meets the acceptable level of .50, while the AVE of EQ and CQ is below the recommended level. However, as suggested by Fornell and Larcker (1981), AVE may be a more conservative estimation of the validity of the measurement model, and 'on the basis of pn (composite reliability) alone, the researcher may conclude that the convergent validity of the construct is adequate, even though more than 50% of the variance is due to error' (Fornell and Larcker, 1981, p.46). Therefore, as the CR of both EQ and CQ surpass the recommended level, the internal reliability of the measurement items is acceptable. These results demonstrate that all three EQ, CQ and team climate satisfaction measures display reasonable levels of convergent validity. Regarding discriminant validity, which explains how a single construct is different from the other constructs in the same model, we compared the inter-construct correlations with its respective square root of AVE (SRAVE) (shown on the diagonal of Table 4) to make sure that the value of SRAVE for each construct is greater than its correlation with other constructs (Fornell and Larcker, 1981). Further, by comparing item cross-loadings (see Table 3), we ensured that each item loaded higher on its intended construct than on other constructs. Tables 3 and 4 show that both conditions have been met, confirming adequate discriminant validity of constructs.

Table 3 Team climate satisfaction, emotional intelligence and cultural intelligence factor analysis

<i>Items</i>	<i>Factor loading</i>			<i>AVE^a</i>	<i>CR^b</i>	<i>α^c</i>
	<i>Team climate</i>	<i>CQ</i>	<i>EQ</i>			
CQ01	.12	.59	.19			
CQ02	.07	.58	.23			
CQ03	.13	.62	.13			
CQ04	.10	.59	.17			
CQ05	.09	.63	.02			
CQ06	.01	.66	.02			
CQ07	.04	.62	-.04			
CQ08	.06	.65	.06			
CQ09	.08	.63	-.03			
CQ10	.04	.63	.07			
CQ11	.06	.61	.30	.34	.91	.91
CQ12	.06	.50	.12			
CQ13	.00	.63	.12			
CQ14	.04	.59	.21			
CQ15	.07	.63	.13			
CQ16	.14	.52	.14			
CQ17	.12	.59	.14			
CQ18	.13	.54	.10			
CQ19	.10	.63	.15			
CQ20	.13	.58	.12			
EQ01	.06	.12	.58			
EQ02	.05	.08	.62			
EQ03	.05	.04	.70			
EQ04	.07	.10	.69			
EQ05	.00	.24	.35			
EQ06	.07	.18	.45			
EQ07	.08	.09	.28			
EQ08	.05	.20	.53			
EQ09	.12	.17	.55	.31	.87	.87
EQ10	.11	.05	.61			
EQ11	.06	.08	.64			
EQ12	.08	.09	.53			
EQ13	.10	.11	.52			
EQ14	.13	.07	.68			
EQ15	.05	.10	.73			
EQ16	.05	.07	.63			

Table 3 Team climate satisfaction, emotional intelligence and cultural intelligence factor analysis (continued)

Items	Factor loading			AVE ^a	CR ^b	α ^c
	Team climate	CQ	EQ			
TC01	.76	.04	.10			
TC02	.82	.02	.07			
TC03	.79	.05	.06			
TC04	.86	.05	.06			
TC05	.76	.16	.09			
TC06	.55	.11	.09			
TC07	.63	.17	.10			
TC08	.83	.05	.10	.58	.95	.95
TC09	.84	.10	.13			
TC10	.74	.09	.14			
TC11	.85	.09	.09			
TC12	.82	.13	.09			
TC13	.83	.13	.12			
TC14	.67	.16	.07			
TC15	.68	.10	.10			

Note: ^a AVE = Average Variance Extracted; ^b CR = Composite Reliability; ^c α = Cronbach's Alpha.

Table 4 Means, standard deviations and Pearson's product-moment correlations

Variable	Mean	SD ^a	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) EQ	4.07	.46	.56								
(2) CQ	3.94	.55	.38**	.58							
(3) Team climate satisfaction	3.99	.79	.26**	.27**	.76						
(4) Performance	3.98	.71	.05	.03	.03	1					
(5) Age	22.02	3.69	.05	-.13**	.02	-.02	1				
(6) Gender	1.40	.49	.05	-.04	.04	-.18**	.02	1			
(7) English proficiency	8.94	1.30	.12**	-.01	.01	.05	.10**	-.02	1		
(8) Educational level	1.11	.32	.00	-.13**	-.17**	.16**	.14**	.01	.15**	1	
(9) Cultural diversity	.80	.13	.02	-.01	.12**	.06	.06	-.04	.10**	.24**	1

Notes: * Correlation is significant at the 0.05 level (two-tailed test);
 ** Correlation is significant at the 0.01 level (two-tailed test);
^aSD = standard deviation;
 Square root of the average variance extracted (AVE) shown along the diagonal;
 N = 723.

The model's overall goodness of fit was tested by the Comparative Fit Index (CFI), the Tucker-Lewis index (TLI) and the Standardised Root Mean Square Residual (SRMR) (Asparouhov and Muthén, 2018).

3.3 Measures

Team climate satisfaction: Team climate satisfaction was measured by the four dimensions of team trust, openness for linguistic diversity, elaboration of task-relevant information and team learning behaviour. We measured team trust using four items proposed by Kirkman et al. (2006), which were adapted initially from Jarvenpaa and Leidner (1999). We assessed openness for linguistic diversity using four items adapted from Luring and Selmer (2012), which were initially introduced by Harzing and Feely (2008) and Hobman et al. (2004). The elaboration of task-relevant information was measured based on the four items developed by Kearney et al. (2009). Finally, the four items to measure team learning behaviour were adapted from Edmondson (1999). Each item was answered on a 5-point Likert scale ranging from 1 'disagree' to 5 'agree'. To evaluate the validity and reliability of this measure, we performed CFA. We examined factor loadings to ensure that all items were loaded cleanly and strongly on their corresponding factors. After dropping one item for openness for linguistic diversity with a very low factor loading, all factor loadings for this measure were between .66 and .90. Therefore, the items to measure openness for linguistic diversity were decreased to three items. The CFA results for this four-factor model show a reasonably good fit, with $\chi^2 = 467.36$ (df = 84, $p < .001$), CFI = .96, TLI = .95, GFI = .92, RMSEA = .08 and SRMR = .04.

For each factor, scale reliability was established with Cronbach's alpha, CR and AVE. Cronbach's alphas of all factors range from .82 to .91, exceeding the acceptable level of .70. CR ranges from .81 to .91, while AVE ranges from .59 to .73, which meets the acceptable level of 0.60 for CR and .50 for AVE recommended by Fornell and Larcker (1981). These indicators demonstrate that the measurement items have high-internal reliability. The description of all items contributing to team climate satisfaction, as well as the factor loadings and Cronbach's alpha, CR and AVE indexes, are provided in Table 5.

Table 5 Team climate satisfaction factor analysis

<i>Items</i>	<i>Description</i>	λ^a	<i>AVE</i> ^b	<i>CR</i> ^c	α^d
<i>Team trust (Kirkman et al., 2006)</i>					
TC01	My team members have a high degree of trust in each other.	.78			
TC02	My team members believe that others on the team will follow through on their commitments.	.87	.71	.91	.91
TC03	My team members always do what they say they will do.	.83			
TC04	My team members trust each other to contribute worthwhile ideas.	.90			

Table 5 Team climate satisfaction factor analysis (continued)

Items	Description	λ^a	AVE ^b	CR ^c	α^d
<i>Openness for linguistic diversity (Lauring and Selmer, 2012)</i>					
TC05	My team members enjoy doing jobs with people despite language barriers.	.87			
TC06	My team members make an extra effort to listen to people speaking different languages.	.66	.59	.81	.82
TC07	My team members are keen to learn from people even when communication is slowed down by language barriers.	.76			
<i>Elaboration of task-relevant information (Kearney et al., 2009)</i>					
TC08	The members of this team complement each other by openly sharing their knowledge.	.85			
TC09	The members of this team carefully consider all perspectives in an effort to generate optimal solution.	.89			
TC10	The members of this team carefully consider the unique information provided by each individual team member.	.79	.73	.91	.91
TC11	As a team, we generate ideas and solutions that are much better than those we could develop as individuals.	.87			
<i>Team learning behaviour (Edmondson, 1999)</i>					
TC12	We regularly take time to figure out ways to improve our team's work processes.	.88			
TC13	This team frequently seeks new information that leads us to make important changes.	.89			
TC14	In this team, someone always makes sure that we stop to reflect on the team's work processes.	.71	.62	.87	.87
TC15	People in this team often speak up to test assumptions about issues under discussion.	.68			

Notes: ^a λ = Factor Loading;^b AVE = Average Variance Extracted;^c CR = Composite Reliability;^d α = Cronbach's Alpha.

Emotional intelligence (EQ): EQ was assessed using the WLEIS instrument, developed by Wong and Law (2002). Different studies in various countries have proved the validity and reliability of this instrument (e.g., Fukuda et al., 2012; LaPalme et al., 2016; Li et al., 2012; Libbrecht et al., 2014). The four dimensions of EQ, including self-emotional appraisal ($\alpha = .76$; AVE = .46; CR = .77), others' emotional appraisal ($\alpha = .73$; AVE = .42; CR = .75), use of emotion ($\alpha = .78$; AVE = .48; CR = .79) and regulation of emotion ($\alpha = .81$; AVE = .52; CR = .82) were each assessed using four items, through a 5-point Likert scale (1 'strongly disagree' and 5 'strongly agree'). The CFA for this measure met an acceptable level of model fit ($\chi^2 = 226.11$ ($df = 98$, $p < .001$), CFI = .97, TLI = .96, GFI = .96, RMSEA = .04, and SRMR = .04). The descriptions of all EQ items, as well as the factor loadings, and Cronbach's alpha, CR and AVE indexes are listed in Table 6.

Table 6 Emotional intelligence factor analysis

Items	Description	λ^a	AVE ^b	CR ^c	α^d
<i>Self-Emotional Appraisal</i>					
EQ01	I have a good sense of why I have certain feelings most of the time.	.59			
EQ02	I always know whether or not I am happy.	.59	.46	.77	.76
EQ03	I have a good understanding of my own emotions.	.76			
EQ04	I really understand what I feel.	.74			
<i>Others' Emotional Appraisal</i>					
EQ05	I always know my friends' emotions from their behaviour.	.58			
EQ06	I am a good observer of others' emotions.	.73	.42	.75	.73
EQ07	I am sensitive to the feelings and emotions of others.	.45			
EQ08	I have a good understanding of the emotions of the people around me.	.81			
<i>Use of Emotion</i>					
EQ09	I always tell myself I am a competent person.	.60			
EQ10	I would always encourage myself to try my best.	.72			
EQ11	I am a self-motivated person.	.78	.48	.79	.78
EQ12	I always set goals for myself and then try my best to achieve them.	.66			
<i>Regulation of Emotion</i>					
EQ13	I can always calm down quickly when I am very angry.	.60			
EQ14	I am quite capable of controlling my emotions.	.79	.52	.82	.81
EQ15	I have good control of my own emotions.	.82			
EQ16	I am able to control my temper and handle difficulties rationally.	.71			

Notes: ^a λ = Factor Loading;

^b AVE = Average Variance Extracted;

^c CR = Composite Reliability;

^d α = Cronbach's Alpha.

Cultural intelligence (CQ): We assessed four dimensions of CQ, including metacognitive CQ, cognitive CQ, motivational CQ and behavioural CQ, utilising a 20 Item-measure developed by Ang and Van Dyne (2008). We measured metacognitive CQ ($\alpha = .85$; AVE = .59; CR = .85) using four items, cognitive CQ ($\alpha = .89$; AVE = .58; CR = .89) with six items, motivational CQ ($\alpha = .84$; AVE = .53; CR = .84) with five items and behavioural CQ ($\alpha = .86$; AVE = .57; CR = .87) using five items. Each item was answered on a 7-point Likert scale ranging from 1 'strongly disagree' to 7 'strongly agree'. The CFA results for the CQ measure show a reasonably good fit ($\chi^2 = 540.04$ ($df = 164, p < .001$), CFI = .95, TLI = .94, GFI = .93, RMSEA = .06 and SRMR = .04). Table 7 provides the descriptions of all CQ items, as well as the factor loadings, and Cronbach's alpha, CR and AVE indexes.

Table 7 Cultural intelligence factor analysis

<i>Items</i>	<i>Description</i>	λ^a	<i>AVE</i> ^b	<i>CR</i> ^c	α^d
<i>Metacognitive CQ</i>					
CQ01	I check the accuracy of my cultural knowledge as I interact with people from different cultures.	.72			
CQ02	I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me.	.75			
CQ03	I am conscious of the cultural knowledge I apply to cross-cultural interactions.	.84	.59	.85	.85
CQ04	I am conscious of the cultural knowledge I use when interacting with people from different cultural backgrounds.	.77			
<i>Cognitive CQ</i>					
CQ05	I know the arts and crafts of other cultures.	.80			
CQ06	I know the cultural values and religious beliefs of other cultures.	.78			
CQ07	I know the rules (e.g., vocabulary, grammar) of other languages.	.68	.58	.89	.89
CQ08	I know the legal and economic systems of other cultures.	.76			
CQ09	I know the marriage systems of other cultures.	.80			
CQ10	I know the rules for expressing nonverbal behaviours in other cultures.	.74			
<i>Motivational CQ</i>					
CQ11	I am sure I can deal with the stresses of adjusting to a culture that is new to me.	.78			
CQ12	I enjoy interacting with people from different cultures.	.60			
CQ13	I enjoy living in cultures that are unfamiliar to me.	.75	.53	.84	.84
CQ14	I am confident that I can get accustomed (get used) to the shopping conditions in a different culture.	.71			
CQ15	I am confident that I can socialize with locals in a culture that is unfamiliar to me.	.74			
<i>Behavioural CQ</i>					
CQ16	I alter my facial expressions when a cross-cultural interaction requires it.	.77			
CQ17	I change my nonverbal behaviour when a cross-cultural situation requires it.	.84			
CQ18	I change my verbal behaviour when a cross-cultural situation requires it.	.67	.57	.87	.86
CQ19	I use pause and silence differently to suit different cross-cultural situations.	.74			
CQ20	I vary the rate (speed) of my speaking when a cross-cultural situation requires it.	.72			

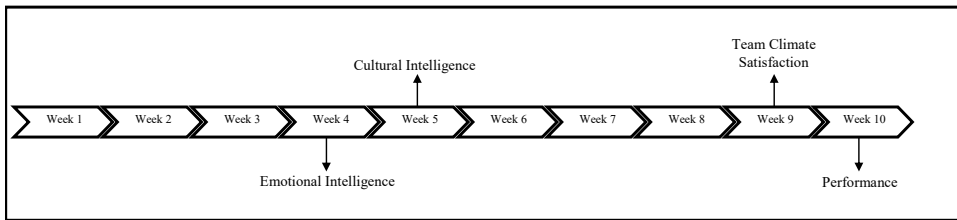
Notes: ^a λ = Factor Loading;
^b AVE = Average Variance Extracted;
^c CR = Composite Reliability;
^d α = Cronbach's Alpha.

Performance: We measured the individual performance through a composite measure of peer evaluations an individual received during the project. The measure included five aspects related to both task and contextual performance (Conway, 1999), such as effort (‘Please evaluate the performance of each of your team members: Was hard-working.’), quality of ideas (‘Please evaluate the performance of each of your team members: Had creative ideas.’), communication (‘Please evaluate the performance of each of your team members: Nice, friendly, positive.’), collegiality (‘Please evaluate the performance of each of your team members: Worked closely with this person.’), and help coordinate team efforts (‘Please evaluate the performance of each of your team members: Showed leadership, helped with coordination.’). The evaluation was measured on a scale that ranges from 1 ‘poor’ to 5 ‘excellent’

Controls: Control variables include age, gender, English proficiency, educational level and cultural diversity. Age was measured in years. Gender (1 for female, 2 for male) and educational level (1 for students at the undergraduate level, 2 for students at the graduate level) are dichotomous variables. English proficiency was assessed using a short TOEFL-like test and on a scale ranging from 1 ‘poor’ to 10 ‘excellent’. To measure the teams’ level of cultural diversity, we divided the number of different nationalities within a team by the team size. The results ranged from 0.5 to 1. Team cultural diversity was coded as 1 when all team members were from different countries, and 0 when all team members were from the same country, while the numbers in between denote other cultural diversity combinations.

Figure 2 represents the timeline of when dependent and independent variables were measured during the study.

Figure 2 Measurement timeline



4 Results

Table 4 presents the descriptive statistics and Pearson’s product-moment correlations. As the table shows, EQ is positively and significantly correlated with CQ ($p < .01$), suggesting that the higher the level of individuals’ EQ, the higher the level of their CQ. Further, both EQ and CQ are positively and significantly related to team climate satisfaction ($p < .01$). This implies that as the EQ and CQ of team members increase, their satisfaction with team climate also improves. Performance is also negatively and significantly related to gender ($p < .01$) and positively and significantly related to educational level ($p < .01$). In other words, women seem to show better performance, as well as graduate-level students, show higher performance than undergraduates.

Table 8 presents the MSEM and mediation analysis results. The results are consistent with the inputs presented by the correlations matrix. At the individual level, EQ is

positively and significantly related to team climate satisfaction (.24; $p < .001$). CQ of individuals is also positively and significantly related to team climate satisfaction (.17; $p < .01$). This means that the higher the level of EQ and CQ of each team member, the more satisfied with the team climate they are. Thus, Hypotheses 1a and 1b are supported. Contrary to what we predicted, team members' satisfaction with team climate is negatively and significantly associated with their performance (-.14; $p < .01$). Thus, Hypothesis 2 is not supported. Hypotheses 3a and 3b state that team members' satisfaction with team climate positively mediates the relationship between both their EQ and CQ and their performance. The results show that both EQ (-.04; $p < .01$) and CQ (-.02; $p < .05$) negatively and significantly influence individual performance through team climate satisfaction. Therefore, Hypotheses 3a and 3b are not supported.

Table 8 MSEM and mediation analysis results

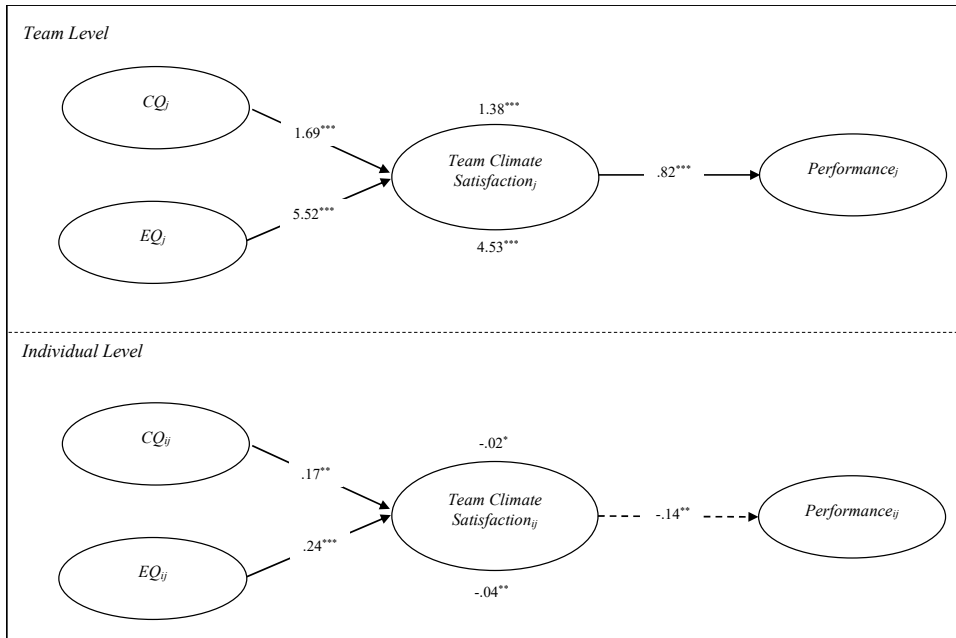
Level of analysis	Relationship	Hypothesis	Estimate	S.E.	Est./S.E.	P-Value	Result
Individual Level	EQ → Team Climate Satisfaction	1a	.24	.06	4.28	.000	Supported
	CQ → Team Climate Satisfaction	1b	.17	.06	2.80	.005	Supported
	Team Climate Satisfaction → Performance	2	-.14	.05	-3.08	.002	Not Supported
	EQ → Performance (indirect)	3a	-.04	.01	-2.63	.009	Not Supported
	CQ → Performance (indirect)	3b	-.02	.01	-2.04	.042	Not Supported
Team Level	EQ → Team Climate Satisfaction	4a	5.52	1.38	4.01	.000	Supported
	CQ → Team Climate Satisfaction	4b	1.69	.39	4.37	.000	Supported
	Team Climate Satisfaction → Performance	5	.82	.11	7.62	.000	Supported
	EQ → Performance (indirect)	6a	4.53	1.23	3.70	.000	Supported
	CQ → Performance (indirect)	6b	1.38	.36	3.87	.000	Supported

Notes: CFI= .86, TLI= .70, SRMR (within)= .06, SRMR (between)= .16; N= 723.

At the team level, the average EQ is positively and significantly related to the average team climate satisfaction within the team (5.52; $p < .001$). Similarly, the average CQ is also positively and significantly associated with the average team climate satisfaction (1.69; $p < .001$). This implies that in GVTs, as the average of EQ and/or CQ increases within the team, the average team climate satisfaction also improves. The average team climate satisfaction within the team is also positively and significantly related to collective performance (.82; $p < .001$). Moreover, average team climate satisfaction positively and significantly mediates the relationship between average EQ and collective performance (4.53; $p < .001$), as well as average CQ and collective performance

(1.38; $p < .001$). Thus, Hypotheses 4a, 4b, 5, 6a and 6b are supported. Furthermore, performance is positively and significantly related to educational level ($.59; p < .001$) and negatively and significantly related to gender ($-.27; p < .001$). That is, as the educational level of team members increases, they perform better within the team. Further, it suggests that women perform better in GVTs. The MSEM fit indices, such as CFI = .86, TLI = .70, SRMR (within) = .06, and SRMR (between) = .16, indicate a satisfactory agreement of the model with the data. Figure 3 represents the results of model testing.

Figure 3 Results of model testing



Note: The coefficients above and below the team climate satisfaction construct refer to the mediation effects.

5 Discussion

GVTs continue to grow in popularity in response to globalisation and the information revolution (Lepsinger and DeRosa, 2010), requiring new workplace competencies. Drawing on the multiple intelligences theory (Gardner, 1983), the present study acknowledges the importance of EQ and CQ as two critical competencies in collaboration with members of different cultural backgrounds. We examined the causes and effects of team climate satisfaction in GVTs. The results of our study can be discussed considering the different levels of analysis. At the individual level, the results show that EQ and CQ of individuals are positively related to their satisfaction with the team climate. However, team climate satisfaction is negatively associated with individual performance. At the team level, the results show that both team’s average EQ and CQ are

positively associated with the average team climate satisfaction within the team, which in turn, is positively related to collective performance in GVTs.

We also examined the mediation effect of team climate satisfaction on the relationship between EQ and CQ and performance in GVTs. The results show that at the individual level, team climate satisfaction has a negative significant mediation effect on the relationship between EQ and CQ and individual performance in GVTs. That is, team members with higher EQ or CQ tend to be more satisfied with the team climate. The team member's satisfaction with the team climate, in turn, negatively mediates the effect of EQ and CQ on individual performance in GVTs. While, at the team level, the indirect effect of EQ and CQ on performance via team climate satisfaction is positively significant, indicating that GVTs whose team members have higher average EQ and/or CQ tend to be more satisfied with team climate, which in turn positively mediates the effect of group EQ and CQ on collective team performance. The contradictory findings at the individual and team levels are an interesting topic that calls future researchers to explore in more depth.

The main contribution of this research is to highlight the significance of studying CQ and EQ simultaneously in GVTs. Based on the theory of multiple intelligences (Gardner, 1983), intelligences are interactive, and more than one type of intelligence can be applied in a specific situation (Martin, 2001). However, existing research has mainly examined the impact of only one type of intelligence in a single study. Particularly, past research has mainly focused on the importance of CQ in the GVT context (e.g., Presbitero, 2020b, 2021; Richter et al., 2021), while the role of other types of intelligence like EQ in GVTs has been overlooked (Davaei and Gunkel, 2023). EQ is a key dimension of CQ, meaning that to have a high CQ, one needs to have a high EQ as well. According to Peterson (2004), CQ runs through various aspects of the EQ concept and multiple intelligences theory, including linguistic, spatial, intrapersonal (or emotional) and interpersonal intelligences. According to Peterson (2004), EQ can be viewed as similar to intrapersonal intelligence. In multicultural settings, individuals must be able to reflect on themselves and their own culture. As a result, they can compare themselves with others and adjust their behaviours in new cultural settings. Furthermore, individuals with interpersonal intelligence are able to interact appropriately with people from different cultural backgrounds (Bovornusvakool et al., 2015). As a result, CQ and EQ complement each other in multicultural contexts like GVTs. A recent study shows that EQ and CQ are interrelated constructs, emphasising the importance of studying CQ and EQ together in GVTs (Davaei et al., 2022). Moreover, the results of our study indicate that EQ and CQ improve team climate satisfaction in GVTs. This result strengthens the prior research findings indicating that EQ and CQ of individuals reduce the occurrence of intragroup conflicts in GVTs (Davaei et al., 2022). That is, satisfaction with the team climate could be a reason to reduce conflict in a team.

5.1 Managerial relevance

This study extends our understanding of multiple intelligences and their impacts on the performance of individuals in GVTs. The results of our study are most relevant to human resource managers dealing with team member selection in GVTs. According to previous research, EQ (e.g., Clarke, 2010; Slaski and Cartwright, 2003) and CQ (e.g., Erez et al., 2013; Presbitero and Toledano, 2018) can be improved through experience, education and training; thus, investing in EQ and CQ training programs may result in more

satisfaction with team climate and performance in GVTs. However, improving intelligences through training programs is not the most effective solution, as training programs are costly and inefficient in creating results (Cadman and Brewer, 2001). Instead, using EQ and CQ assessment tools and selecting suitable candidates at the recruitment stage can minimise training costs and improve productivity in GVTs (Wasylyshyn, 2010).

5.2 Research limitations

Our findings must be viewed considering the present study's limitations. Using a student sample may be discussed as an important limitation of the study. The external validity of the results may be affected by having used a student sample, for their motivation to work on a project may not be representative of that held by employed employees (Furumo and Pearson, 2006). However, one should note that first, the students participating in this study were in business programs and many had work experience. Second, this project's work design and incentive structure were like an actual consulting project. The participants had access to the CEO and top managers, the same as in any other consulting project. In fact, the GVTs of our study were real project teams working for actual client companies with real compensation and career growth opportunities. Further, several incentives have been raised for the best students and the most successful teams, such as after-market commission and travel stipends to the annual symposium, internship and job offers by the client organisations. Therefore, the GVTs of the present study cannot be regarded as artificial groups used in an experiment. Even though the student projects are substantially shorter than those in an organisational setting, the type of teams in the present study reflects many temporary, project-oriented teams in organisations (Cohen and Bailey, 1997). Therefore, the findings can be generalised to short-term project teams in organisations. Future studies may extend this research and examine GVTs in organisations.

The second limitation of this study is the teams' cultural combinations. Cultural differences have the potential for both synergy and disruption (Morosini, 1998; Parkhe, 1991). It may result in a lack of fit and thus could lower satisfaction with the team climate. On the other hand, differences in cultures may complement each other, leading to a positive synergetic effect on performance (Hofstede, 1989). Therefore, it is unclear how results might differ with the different cultural distances between the team members. The influence of cultural distance on team climate satisfaction and performance in GVTs may be addressed by future research.

Third, although the data used for our study includes self-evaluations and peer evaluations and were collected during different time points, the study used a cross-sectional research design, limiting our ability to make causal inferences. Future research may want to extend this study by performing longitudinal studies to confirm causality.

Finally, our results show that at the individual level, team climate satisfaction is negatively associated with individual performance. This result could be due to the free-riding effect. Free-riding is 'a behaviour pattern wherein an individual working in a group setting fails to contribute their fair share to a group effort perceived by group members' (Aggarwal and O'Brien, 2008, p.256). Individuals may perform at lower levels when they perceive a positive team climate – they trust their team members and believe they will work on achieving the team's goals. Thus, they receive a 'free ride' by contributing little and relying on other members to finish the collaborative work. GVTs

are more vulnerable to free-riding behaviour (Latane et al., 1979), as they lack face-to-face contact and informal interactions, leading to less intrinsic involvement (Finholt and Sproull, 1990), and thus more free-riding behaviour. Future research may want to examine the effect of free-riding behaviour on the relationship between team climate satisfaction and performance in GVTs.

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