

# Evolution of Cultural Intelligence in Students Working in Multi-national Teams: A Case-Study

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**Abstract**—The number of individuals from different cultural backgrounds that work together has increased in the last years and it is expected to keep growing. Cultural differences in the workplace correlate to poor task performance and may lead to conflicts. The abilities to best interact in a multi-cultural context are still unclear, but researchers argue that being comfortable in multi-cultural environments requires more than just cognitive intelligence. Individuals who live or work in other cultures seem to gain knowledge that can further affect their behaviors and facilitate their interactions in multi-cultural settings. We theorize that individuals working together in multi-national teams, even for a short period, may experience a change in their cultural intelligence. Using a Pre- and Post-test design, we examined 69 graduate students. Subjects worked together in a project-based class for one semester (15 weeks). Cultural intelligence was measured by the Cultural Intelligence Scale (CQS). Results indicate that individuals' cultural intelligence grow 7,2% over the period of one semester. The cultural intelligence facets metacognitive, cognitive, and motivational presented significant increases as well. The outcomes of this study can be used in the training of individuals that need to act in culturally diverse environments. Possible directions for further research are discussed.

**Keywords**—cultural intelligence, intergroup relations, multi-cultural, multi-national, team

## I. INTRODUCTION

The number of individuals working or studying in international settings is increasing and this growth is expected to continue [1]. Nevertheless, these experiences are frequently classified as unsuccessful [1, 2, 3]. Cooperation between individuals from different backgrounds has been proven necessary to address the complex tasks demanded by the job market [4, 5]. However, cultural differences in the workplace seem to be correlated to poor task performance [6] and may lead to conflicts [7, 8, 9]. Members of multi-cultural teams hold diverse cultural identities, affecting their understanding, interpretation, and behavior [9, 10, 11]. Research indicates that cultural values play a critical role in human behavior in organizations [6], as those values influence both role expectations and perceptions of role expectations [12, 13].

Individuals who operate in multi-cultural contexts are expected to develop shared common meanings, values, and codes of behaviors to effectively communicate with each other and coordinate their activities [14]. It has been shown that individuals who live or work in different cultures gain knowledge that can further affect their attitudes and behaviors [15, 16, 17]. However, the abilities to best interact in a multi-cultural context are still unclear [18].

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The concept of cultural intelligence (CQ) emerged because researchers believe that being comfortable in multi-cultural environments requires more than just cognitive intelligence [18]. CQ is defined as an individual's capability to function and manage effectively in culturally diverse settings [19]. Individuals with high CQ have a set of mental (metacognitive and cognitive), behavioral, and motivational abilities that allow them to work effectively with persons from diverse cultures and adapt to foreign environments [19, 20]. These individuals are considered to be culturally competent [18].

### A. The Multidimensional Concept of CQ

CQ is conceptualized by Ang and van Dyne [19] as a four-dimensional construct: two mental facets (metacognitive and cognitive), along with the motivational and behavioral facets of CQ [19].

Metacognitive CQ is defined as a person's mental processing in order to gain awareness and understanding of the appropriate ways of a different culture [12, 21]. Those high on metacognitive CQ are consciously aware and mindful of cultural preferences and norms [22]. Additionally, individuals with a higher metacognitive CQ always question cultural assumptions and adjust their mental models to find the preferred one [21].

Cognitive CQ focuses on knowledge of norms, practices, and conventions in different cultural settings [12]. Individuals high on cognitive CQ have better cognitive-processing capabilities in a new cultural setting and can incorporate further information to understand and interpret new experiences [21]. Moreover, they can anticipate and understand similarities and differences across cultures [22] and understand better their own role and their role expectations [12, 13].

Motivational CQ is the capability to direct attention and energy toward learning about, practicing and functioning in culturally different situations [6]. Those high in motivational CQ experience intrinsic satisfaction when acting in multi-cultural environments and are confident about their ability to function in these settings [22]. Those individuals tend to have a stronger desire to accept challenges in a new environment and a greater will to tolerate frustration, what consequently leads to better adaptability [21].

Finally, behavioral CQ is the capability to exhibit situationally appropriate actions from a broad repertoire of verbal and non-verbal behaviors [12]. An individual with a higher behavioral CQ gains more natural acceptance by the associated group, which helps him/her to develop better interpersonal relationships [21].

Previous studies on multi-cultural settings have established a positive relationship between CQ and

adjustment/adaptation to new contexts [e.g., 12, 20, 23] and between CQ and job performance/effectiveness [e.g., 12, 21, 23, 24]. It has been showed that CQ aids leaders to enhance their teams' performances [11, 25] and that CQ also helps integration in overseas contexts [26].

### B. Development of CQ

Conceptual and empirical work on multidimensional CQ suggests that CQ dimensions are capabilities that can be developed, correlating this growth to environmental and individual factors [17]. Travelers that cross international borders gain a cultural experience that seems to guarantee them more opportunities to acquire and cultivate metacognitive strategies and interaction models, such as greater cultural sensitivities to and awareness of cultural differences and norms [15, 16, 17]. Individuals high on metacognitive CQ are more conscious and mindful of environmental changes, including cultures in different travel destinations [17, 22]. Yet, more cultural experiences may not translate into higher awareness during intercultural interactions [17], as the negative physical and psychological impact of the trip may prevent travelers from processing and adapting those cultural experiences at a deeper level [17].

Research shows that short-term trips increase the knowledge of specific cultural environments and develop the cognitive aspect of CQ [17]. Individuals high on cognitive CQ have more stored cultural information [17]. Higher exposure to international experiences should build travelers' confidence in their ability to function in different cultures [15, 17, 26], that is, enhance motivational CQ. Individuals with high motivational CQ are interested in learning about effective interactions at different destinations [17, 22, 26, 27].

The contact with multi-cultural environments should also expose travelers to wider repertoires and deeper understanding of behavioral norms [17]. Individuals high on behavior CQ may consciously monitor and adjust their verbal and nonverbal behaviors to align them with the cultural expectations of the locals [17]. Yet, knowledge of the acceptable behaviors does not necessarily translate into actual behavior [17], as individuals tend to slowly change their comportment, learning from their social interactions [15, 16, 17, 29]. Particularly in short trips, travelers may not have adequate opportunities to practice and develop verbal and nonverbal repertoires of acceptable behaviors [17].

Previous findings postulate that training courses may enhance individuals' CQ so that they become more willing to learn and face cultural challenges, as that might make them achieve higher performances [24, 27, 31]. Some authors report that cultural training is most effective a) when it is designed to be relative to specific individuals in a specific context; b) when it is begun prior to the trainees' departure from their home culture; and c) continues periodically during their stay in the host country [20]. Whereas, others claim that training should happen with a well-structured program that has: a) clear organizational support; b) close contact with individuals from a specific culture different from one's own for a highly concentrated period of time of at least a one to two weeks duration; c) very high frequency of contact and communication (near constant contact during the program duration) with the targeted cultural group; d) equal status of both groups of participants (trainees and targeted cultural group); and e) clear and meaningful goals in which there is mutual dependence between both the trainee and targeted

cultural groups. Even though that training seems to enhance CQ, most individuals do not get through it before traveling [17].

The *contact hypothesis* proposed by Allport [28] suggest that the increased contact with a specific context would improve inter-group relationships. According to Social Learning Theory [29], individuals learn new behaviors through attention, retention, and reproduction. Moreover, Social Learning Theory claims that this learning integrates both cognitive and behavioral processes and is influenced by motivation and consequences [29]. Therefore, for an individual to learn appropriate behaviors to live and work in a country, they need to observe natives' behaviors and have the opportunity to reproduce them in the environment [18].

Research shows that CQ increases in short-term (7 to 12 days) structured international experiences, with pre-trip training [27] and without pre-trip training [17]. Yet, a limitation of these studies, as some authors report [27], is that this growth might be explained by what has been labeled as the *honeymoon phase* of cultural adaptation to a foreign culture. This typically occurs in the very early arrival period of a subject to a foreign country [27]. Findings also claim that CQ also increases in longer exposures (6 months) with pre-trip preparation [31]. Still, it is not clear if this growth would also be significant in a non-structured exposure, without pre-trip training.

### C. CQ in multi-national educational settings

Authors [18] report that CQ has been perceived as an important skill set for graduates in the current globalized environment. Multi-cultural environments are also present in academia, as some programs present a mix of students from all over the globe. The concept of creative chaos firstly appears at academia, to characterize a specific dynamic process of collaborative design and development [30], where students from different disciplines and different cultures work together for one semester (15 weeks) in the development of an innovative product. Creative chaos is seen as the term to "try and encapsulate the creative production process, which is often full of ambiguous ideas about what you are trying to actually make" [30, p. 14]. This process is chaotic as individuals, working in interdisciplinary and multi-national teams, need to iterate their way toward a good design that also meets the goals of the project [30].

We designed a study to investigate if having a non-structured experience in a multi-national team for a short period (15 weeks) would change the self-reported cultural intelligence of its team members. Previous studies about the evolution of CQ have been made with: short exposure (up to 1 month) without pre-trip training [17]; short exposure (up to 12 days) with pre-trip training [27]; longer exposure (6 months) with pre-trip training [31]. To the best of our knowledge, this was the first time that CQ has been investigated in individuals operating in multi-national teams in a 15 weeks period.

## II. METHOD

Subjects in this study were 85 college graduate students in a disciplinary diverse graduate program, with the duration of two years, in a Northeastern US university, in Spring 2017. Participants worked in teams, in a project-based class, for one semester. Teams in this study went through a specific dynamic

process of collaborative design and development, the creative chaos [30].

A total of 69 students agreed to voluntarily take part in the study (81% response rate). Nine questionnaires were incomplete, hence were excluded from the data analysis. Participants had gender equality (51% females and 49% males) and the mean age of 25 years old (age range 21-42). Responders come from China (42,4%), US (31,8%), India (12,1%), South Korea (4,6%), Taiwan (3,1%), Great Britain (1,5%), Israel (1,5%), Malaysia (1,5%), and Singapore (1,5%).

Cultural Intelligence Scale (CQS) [12] measured CQ (Pre-test: N=60,  $\alpha=.78$ ; Post-test: N=34,  $\alpha=.84$ ). CQS is a self-reported 20-item instrument with questions like “I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me.”, “I know the rules for expressing non-verbal behaviors in other cultures.”, “I am confident that I can socialize with locals in a culture that is unfamiliar to me.”, and “I use pause and silence differently to suit different cross-cultural situations.”. CQS uses a seven-point scale ranging from 1=*strongly disagree* to 7=*strongly agree*. CQS comprises four sub-scales to measure the four-dimensions of CQ: Strategy (metacognitive facet of CQ; 4 items,  $\alpha=.70$ ); Knowledge (cognitive facet of CQ; 6 items,  $\alpha=.63$ ); Motivation (motivational facet of CQ; 5 items,  $\alpha=.73$ ); and Behavior (behavioral facet of CQ; 5 items,  $\alpha=.73$ ).

This study was designed as a quasi-experiment with Pre- and Post-test. Participants were assigned to groups by their faculty members. The assignment process attains to build disciplinary and culturally diverse teams, as it has been reported that when developing innovative artifacts, heterogeneous teams perform better [30].

Subjects firstly received an email with an invitation to participate in the study. Those that agreed to take part received an email with the first questionnaire at the beginning of the semester (Pre-test) and another questionnaire at the end of the semester (Post-test). Both questionnaires included the instrument CQS (20 items). The first survey also included demographic questions (age, gender, and country of origin).

### III. RESULTS AND DISCUSSION

CQ presented a 7.2% growth (Pre-test global M=5.1; Post-test global M=5.39) over 15 weeks (Fig. 1). This result confirms previous findings that describe CQ dimensions as capabilities that can be developed and that can increase over time [17, 18, 20, 27, 31]. This is consistent with Bandura’s Social Learning Theory [29] and reports that individuals who live or work in other cultures gain knowledge that can further affect their understanding, attitudes, and behaviors [e.g., 12, 15, 16, 17, 25, 27]. Individuals who operate in multi-cultural contexts are expected to develop with their teammates shared common meanings, values, and codes of behaviors in order to effectively communicate with each other and coordinate their activities [12, 13, 14, 25]. They should achieve a better understanding of their own role [6, 12, 13], superior adaptation to the multicultural setting [19, 20], and that may lead to more effective work [19, 20]. Interactions within multi-cultural teams seem to enhance individual cultural competency, which is consistent with the *contact hypothesis* [28].

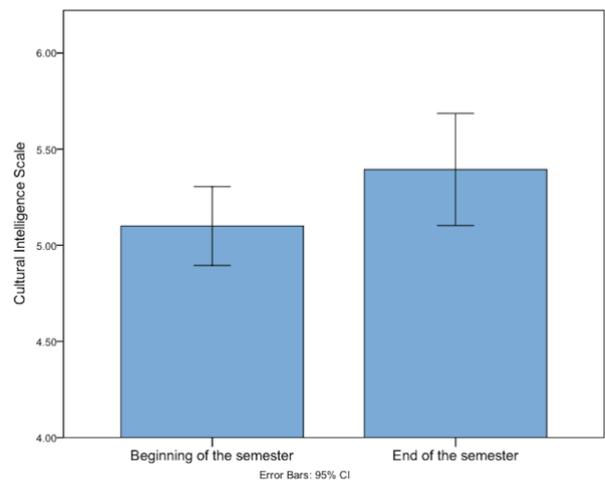


Fig. 1. Comparison of the cultural intelligence scale

All CQ facets increased from Pre-test to Post-test (Fig. 2). A paired-samples *t*-test has uncovered statistically significant differences in the sub-scales Strategy, Knowledge, and Motivation (Table I). The difference in the sub-scale Behavior did not meet the 95% confidence threshold (Table I).

Previous findings mention that being exposed to other cultures increases individuals’ metacognitive CQ, that is, their sensitivity and awareness of differences and norms [15, 16, 17, 21, 22], but also rises cognitive, motivational, and behavioral CQ [27, 31]. However, some authors report a negative physical and psychological impact of the trip, that may prevent travelers from processing and adapting to the new context [17], as more cultural experiences do not translate into higher metacognitive CQ [17]. Conversely, Engle and Crowne [27] report that a short-time (7 to 12 days) structured international experience, with pre-trip training, is enough to increase all CQ facets and did not find the negative physical and psychological impact of the trip. However, as Engle and Crowne [27] refer, the *honeymoon effect* might have influenced their results. Şahin *et al.* found that, in a six-months international experience with pre-trip training, all CQ facets grow and they did not report the negative effect of the trip [31].

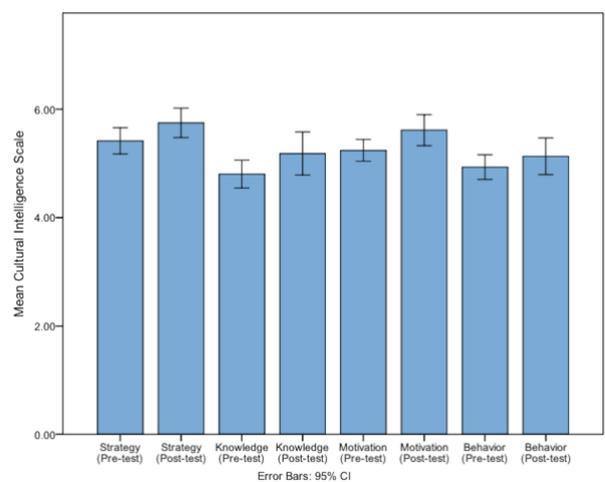


Fig. 2. Evolution of the cultural intelligence scale, per facet

TABLE I. CULTURAL INTELLIGENCE SCALE (CQS) IN THE PRE-TEST AND POST-TEST

| CQ facets (n=35) | Pre-Test M (SD) | Post-test M (SD) | t     | df | p               |
|------------------|-----------------|------------------|-------|----|-----------------|
| Strategy         | 5.42 (0.71)     | 5.75 (0.79)      | -2.75 | 34 | .01             |
| Knowledge        | 4.80 (0.75)     | 5.18 (1.16)      | -2.4  | 34 | .05             |
| Motivation       | 5.24 (0.59)     | 5.62 (0.84)      | -2.85 | 34 | .01             |
| Behavior         | 4.93 (0.66)     | 5.13 (0.98)      | -1.47 | 34 | ns <sup>a</sup> |

<sup>a</sup>. Non-significant at a 95% confidence level.

Our data show that metacognitive CQ increased over the period of 15 weeks (Table I), which confirms past findings, even though these had different time exposures [17, 27, 31]. Our study did not include pre-trip training, what might explain a more conservative growth rate in the metacognitive when compared to other studies [27, 31].

Research shows that short-term trips tend to increase the knowledge of specific cultural environments and develop the cognitive aspect of CQ [17, 18, 27, 31]. Our study corroborates this claim, as the knowledge CQ is higher in the Post-test, that is, after a short-period exposure to a multi-national team environment (Table I).

Motivational CQ was higher at the end of the semester (Table I), confirming previous findings that reported that exposure to multi-cultural settings raises confidence in the ability to function in different cultures [15, 17, 26], and boost their stimulus to learn about effective interactions on those contexts [17, 22, 26, 27, 31].

Behavior CQ is the sub-scale that presents a lower level and a lower growth rate (Table I). Social Learning Theory researchers help to explain this lower growth as they argue that through social interactions individuals become aware of the behavioral norms, while their comportment tends to change at a slower pace, especially when compared to cognitive change [15, 16, 17, 29]. Literature is inconsistent when reporting the evolution of behavioral CQ, as some authors found that short-term travelers often do not have adequate opportunities to practice and develop verbal and nonverbal repertoires of acceptable behaviors [17], whereas others claim that short-term trip (7 to 12 days) or longer trips (6 months) are enough to change behavior and increase behavioral CQ [27, 31]. Our study showed that CQ grows in a 15 weeks period, but not in a significant level, which does not confirm Engle and Crowne [27] results. This might be explained by the fact that, contrary to other works [24, 27], in our study participants did not go through previous training, or by the *honeymoon phase* that might have positively biased Engle and Crowne's study, which the authors identify as a limitation [27]. Moreover, our sample included individuals from nine different countries, with their own cultural identities, which might have made it harder for participants to behave accordingly to these multiple cultural differences.

#### IV. CONCLUSION AND LIMITATIONS

The present study makes a valuable contribution to the body of research on multi-cultural effectiveness in working teams. It also contributes to the understanding of the evolution of cultural intelligence. First, it shows that exposure to multi-national settings, even for a short period (15 weeks) and without pre-trip training, enhances cultural intelligence, in its

metacognitive, cognitive, and motivational facets. Thus, it can further predict a better adaptation to culturally diverse environments.

Second, it indicates that, even though individuals increase their cognitive CQ within 15 weeks of exposure to a multi-national context, behavioral change seems to take more time to be effective.

Last, this study offers important implications for practice, both for practicing managers and multi-national companies, as it suggests that operating in multi-national teams improves the understanding of the cultural differences and enhances the ability to work more effectively on those environments.

Although the present study provides valuable insights into an understanding of the extended literature on cultural intelligence and examines if the exposure to multi-national environments enhances cultural intelligence, a key limitation is that the sample was comprised of university students, therefore it may not be generalizable to non-student populations. Still, as a study of Cultural Intelligence in diverse academic teams, we believe this work has significant applicability to a wide range of educational settings and is suggestive of diverse teams in general.

Further research should consider including pre-trip training when investigating the effects of CQ after the exposure to multi-national teams during a short period (15 weeks, for instance). It could also consider measuring CQ in different points of the exposure (e.g., before training, right after training, at the arrival to the multi-national setting, two-weeks after the arrival, and 15 weeks after the exposure). These additional efforts will further confirm the validity and generalizability of the findings of the current study.

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