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Cultural Intelligence and Short-Term Study Abroad Length: The Effect of an Undergraduate Cultural Development Course and Short-Term Study Abroad Program on Student CQ

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Abstract

Some colleges, departments, and study abroad offices have developed cultural development courses and study abroad opportunities designed to help improve students' cultural awareness, knowledge, and skills. Some evidence suggests combining these approaches can be effective at helping students increase their Cultural Intelligence (CQ). This study examined the effects of a combined semester long, on-campus cultural development course followed by either a three- or six-week faculty-led study abroad program on student CQ. Students in both short-term programs increased in all four CQ domains (motivation, cognitive, metacognitive and behavior CQ) relative to a comparison group. No differences were found between the three- and six-week program for motivation, cognition, and behavior. However, there was a significant difference in

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metacognitive CQ between the two programs. Our study suggests participating in a semester-long cultural development course prior to a short-term study abroad increases undergraduate students' motivation, cognitive, metacognitive, and behavior CQ.

Keywords:

Cultural intelligence, study abroad, cultural training, social learning theory

Introduction

As universities prepare students for personal and professional success, emphasis is being placed on helping students develop cultural awareness, specifically the knowledge and skills required to effectively navigate the day-to-day intercultural interactions (Liao & Thomas, 2020; Meacham & Gaff, 2006; NAFSA, 2005). The ability to effectively navigate in culturally diverse situations is known as Cultural Intelligence (CQ) (Ang et al., 2007). CQ is conceptualized as four related yet distinct domains: motivation (intrinsic and extrinsic factors, and self-efficacy during intercultural interactions); cognitive (understanding of cultural similarities and differences in regards to knowledge of business, values and norms, socio-linguistics and leadership); metacognitive (ability to plan for and adapt behavior during intercultural encounters through self- and other-awareness and checking assumption); and behavior (capability to execute intended actions, including speech acts, verbal and nonverbal communication). High cognitive, metacognitive and behavior CQ are associated with an individual's ability to apply cultural knowledge to diverse intercultural environments and adapt their behavior accordingly (Fang et al., 2018; Michailova & Ott, 2018). To help students develop high CQ, universities have investigated pedagogical techniques and their impact on individuals' development. Two primary techniques researchers have examined are study abroad and cultural training programs.

Study Abroad Programs and CQ Development

There is a smaller body of literature that has researched CQ growth in US students who study abroad (Chao et al., 2017; McRae et al., 2016; Varela & Gatlin-Watts, 2014). McRae et al., (2016) showed that students who studied while overseas significantly improved their cognitive CQ (i.e., their understanding of cultural differences) more than those who worked overseas; however, students who worked overseas significantly improved their metacognitive CQ (i.e., ability

to plan and adapt their behaviors) and behavior CQ (i.e., their ability to interact appropriately) more. Thus, the type of overseas experience a student has seems to be associated with the type of CQ growth a student will experience. Racicot and Ferry (2016) studied 60 undergraduate students who took courses while overseas during a winter term and found that motivational CQ was a predictor of metacognitive CQ. Plus, students who were more confident in their ability to plan and strategize (higher in metacognitive CQ) were more willing to pursue diverse experiences during their time overseas compared to students with lower metacognitive CQ.

Research also suggests that students on long-term study abroad increase in both cognitive (i.e. knowledge about the country) and metacognitive CQ (i.e. the ability to plan for how to interact with others) but found no difference in the student's motivation or behavior CQ (Varela & Gatlin-Watts, 2014). The longer students stayed overseas, the greater their metacognitive CQ growth (especially for students with lower pre-study abroad metacognitive CQ).

While there is evidence for CQ growth for students on long-term programs, research on non-CQ related study abroad programs provides some insights into how the length of a study abroad may influence students' CQ. Several studies suggest intercultural learning is more effective in long-term study abroad compared to short-term programs due to the increase in exposure and opportunities to interact with locals (Dwyer, 2004; Medina-López-Portillo, 2004; Stephenson, 2002; Vande Berg et al., 2009). However, one study evaluated shorter term (three-week), instructor-led study abroad programs which demonstrated intercultural learning can occur in in this setting (Lorenz et al., 2012). Additionally, research has demonstrated that long-term programs may cause regression in some students unless there is faculty guidance as part of the stud abroad program (Anderson et al., 2006; Lorenz et al., 2012; Pedersen, 2009).

University Cultural Development Courses/ Programs and CQ

University cultural development courses and programs are designed to provide special cultural instruction through stand-alone programs, component of a larger course, or an entire course. A few studies have examined cultural development courses and/or programs to help improve US students' cultural intelligence (Baker & Delpechitre, 2016: Bücker & Korzilius, 2015; Fischer, 2011; Hodges et al., 2011). These programs have used a wide variety of teaching methods, including, lectures, role-play, and experiential learning techniques.

Some programs have found differences in a few CQ domains. For instance, one study examined 172 textile and apparel students' CQ before and after completing a stand-alone series of 8 web-based modules focused on global issues related to the textile industry (e.g., global brand marketing, managing global sourcing, etc.) (Hodges et al., 2011). After completing the modules, students' cognitive (i.e., knowledge) and metacognitive (i.e., planning) CQ increased; however, motivation and behavior CQ scores did not improve. Baker and Delpechitre incorporated video case studies and intercultural buyer-seller role-play interactions into an existing advanced sales course and found significant improvement in all four CQ domains (Baker & Delpechitre, 2016). Bücker and Korzilius taught using an experiential simulation game and found that the game effectively helped increase motivation, metacognitive and behavior CQ among a small group of students compared to a control group (Bücker & Korzilius, 2015).

Fischer examined the effects of cultural training modules within a 42 undergraduate students course and found decreased motivation, cognitive, and metacognitive CQ after the training modules; however, students who self-reported as more open-minded before the modules were introduced had increased motivation CQ (Fischer, 2011).

Combined Study Abroad and Cultural Development Programs

To date, two studies have examined the impact of a combined cultural development program and CQ development. One study consisted of a 1-day pre-departure cultural training course followed by a 6-11-day service-learning study abroad to a comparison group (Engle & Crowne, 2014). They found an increase in all four CQ domains among students in the experimental group and no difference among students in the comparison. Chang Alexander et al. taught a nine-week cultural development course followed by a three-week faculty led, study abroad experience. Their program showed improvements in three CQ domains (cognitive, metacognitive and behavior CQ) (Chang Alexander et al., 2021). Both studies suggest that combining both modalities (teaching culture and cultural immersion abroad) are effective at increase students' CQ.

Current Study

This study examines the association between study abroad length on undergraduate students' CQ after completing a semester-long, on-campus cultural development course and then participating in a short-term study abroad program.

Methods

This study compares the results of an intensive university program comprising a semester-long, on-campus culture course followed by either a three- or six-week study abroad experience. The programs focus on two vastly different cultural zones: Europe and Japan. Students in the three-week study abroad program traveled throughout France, Italy, and Switzerland while students in the six-week program traveled throughout Japan. A comparison group was utilized, comprising of students in an on-campus, non-cultural development focused summer scholars' program. This study was approved by the Institutional Review Board at Purdue University.

Participants

Participation in all programs were open to students in any major and classification and final student selections were made through a competitive application process. After enrollment, all students were approached to participate in the study. Study participation did not impact students' ability to participate in their program. After consenting, all participants were assigned a study ID number and after data collection, the data were de-identified. All students provided written informed consent.

Study Design

Course/Study Abroad Groups

Students enrolled in either the three- or six-week study abroad experience participated in the same semester-long culture course. The course occurred on campus and met weekly for ten weeks. Each class was three hours long. Course topics and assignments focused on all four CQ domains and were developed using Social Learning Theory (SLT). SLT was utilized by instructors to help students by using observational learning, which combines behavior and cognitive elements that teach students new skills and behaviors that students would use in cultural encounters. SLT consists of three phases: attention, retention, and reproduction (Bandura, 1977). Step 1: the attention phase is where students are taught to pay attention to specific skills and behaviors, Step 2: the retention phase is where students learn through memorization or rehearsal of the newly observed skills and behaviors, and Step 3: reproduction phase is where individuals solidify their skill and behavior by enacting the newly observed and rehearsed behavior in real-world encounters, reflecting on these interactions and making any necessary self-corrective adjustments for

future engagement (Bandura, 1977). The culture course allowed students to engage in all three SLT elements while in a controlled environment. This format allows instructors to plan curriculum around the SLT.

During the course, all students practiced two primary activities they would use during their time abroad: journaling about cultural interactions and interacting with individuals from other cultures. The journaling assignments required reflection on past cultural interactions focusing on what went right, what went wrong and how each party's cultural values and communication styles impacted the interaction. Based on these reflections, the students created an action plan to prepare for future cultural interactions and bridge cultural divides when they arise. Students were required to interview two people who held a passport from a country other than theirs. Through these interviews, students were able to test, apply and reflect on the course material while becoming more comfortable discussing cultural differences with people from a different cultural background.

Study Abroad Programs

Both programs were immersive experiences applicable to all majors where students were provided structured and unstructured time to engage with local people and explore each country's respective culture during the three- and six-week study abroad programs. Structured activities included visits to historical sites, geographical sites, local community events, and "drop off" assignments. Drop off assignments required students to meet and interact with local people and apply the knowledge they gained during the cultural development course. Several times a week, students were required to reflect in a journal using breadth, depth, clarity, accuracy, and fairness on these activities. These interactions and reflections allowed for students to reproduce (Step 3 in SLT) what they learned in the classroom through cultural interactions (behavior CQ) and then reflect on how to adapt and plan for future interactions (metacognitive CQ).

During the three-week study abroad program traveled in Europe, students were exposed to large metropolitan areas as well as small, remote towns. Over the three weeks, students traveled approximately every 3-4 days to a new location. During the six-week study abroad program to Japan, students traveled approximately every 3-4 days to a new location within the same country. Over the course of six-weeks, students traversed Japan from the

southern territory of Okinawa, through Tokyo and into the northern regions of Hokkaido.

Comparison Group Program

The comparison group program was a summer university research program designed to allow students the opportunity to take courses and work in laboratories and with research groups while staying on campus for the summer. The program was chosen as a comparison because students were actively engaged in during the same time as the summer study abroad students. The program required students to work in a faculty member's laboratory for 140 hours during the 12-week summer session. Students in the program received no cultural training. At the end of the summer program, students completed a CQ post-assessment.

Measures

Data were collected through the Cultural Intelligence Center using the Cultural Intelligence Scale (CQS™) (Ang et al., 2007), a brief questionnaire measuring CQ across four validated (Ward et al., 2009) domains: motivation, cognitive, metacognitive, and behavior CQ. The CQS™ has construct validity (Matsumoto & Hwang, 2013), convergent, and discriminative validity (AL-Dossary, 2016; Moyano et al., 2015; Ward et al., 2009), and predictive validity (Matsumoto & Hwang, 2013).

Students' demographic data were also collected (age, ethnicity, gender identity, year in school, previous overseas experience, major, and grade point average).

Statistical Analysis Plan

Using the mixed-effects multilevel regressions function in Stata version 15.1, a multivariate multilevel model of change was estimated to examine the relationship between undergraduate students' CQ over time and program type. This model was built to compare students participating in either experimental group (three- and six-week programs) to the comparison group by estimating a model that included Time as a fixed effect and a cross-level interaction between Time and cohort participation.

To compare the three-week verses six-week programs, multivariate multilevel models of change were estimated to examine the relationship between undergraduate students' CQ over time and the length of their study

abroad program. This analysis contains estimated coefficients for a two-level hierarchical linear structure containing student responses collected at two time points nested within each student. At level 1, this dataset includes Time as a dummy variable, which was coded as 0=Time 1 (Pre) and 1=Time 2 (Post). At level 2, this dataset includes unchanging student characteristics such as program, age, ethnicity, gender identity, year in school, previous overseas experience, major, and grade point average.

The final model was built through a series of steps. First, we fit an unconditional means model, which accounted for the intercept but contained no predictors. Next, we fit a multilevel model of change using a linear slope parameter of Time as both a fixed and random effect. Then, we included all level 2 variables as fixed effects. The final model incorporated a cross-level interaction effect between student CQ from Time 1 (Pre) to Time 2 (Post) and program. This process of model building was repeated four times - once for each of the four CQ domains.

We also analyzed between-group differences in CQ development by calculating Cohens' d effect sizes using pre/post CQ scores. These effect size calculations help illustrate the magnitude of difference in CQ development experienced by each group.

Results

Participants

A total of 51 students participated in the culture course/study abroad program, 26 (50.9%) were in the three-week study abroad program and 25 (49.1%) in the six-week program. Among the 26 students in the three-week program, students were predominantly White (95%); almost three-fourths were female (73.07%); and most had never been overseas before (73.07%) (see Table 1 for full demographics). There were 25 students in the six-week program, students were predominately male (60%) a majority were White (64%), and over two-thirds had never been overseas before (68%).

	Three Weeks	**Six Weeks**
	n=26	n=25
Age		
≤19	10 (38%)	13 (52%)
20	12 (46%)	8 (32%)
≥21	4 (15%)	4 (16%)

Race/Ethnicity		
LatinX	1 (4%)	1 (4%)
Black	0	2 (8%)
White	22 (85%)	16 (64%)
Asian	2 (8%)	3 (12 %)
Two or More	1 (4%)	3 (12 %)
Gender Identity		
Female	19 (62%)	9 (36%)
Male	7 (27%)	15 (60%)
Non-binary	0	1 (4%)
1st Time Overseas?		
Yes	19 (62%)	17 (68%)
No	7 (27%)	8 (32%)
Year in School		
Freshman	6 (23%)	7 (28%)
Sophomore	6 (23%)	9 (36%)
Junior	11 (42%)	7 (28%)
Senior	3 (12%)	2 (8%)
GPA		
≤2.5	1 (4%)	5 (20%)
2.5-3.49	12 (46%)	12 (48%)
≥3.5	13 (50%)	8 (32%)
Residence Status		
In-State	15 (58%)	16 (64%)
Out-of-State	11 (42%)	8 (32%)
International	0	1 (4%)
Majors		
STEM	21 (81%)	16 (64%)
Liberal Arts	4 (15%)	2 (8%)
Business	1 (4%)	3 (12%)

TABLE (1): STUDENT DEMOGRAPHICS

CQ Comparison Between Cohorts

Students in both the three- and six-week groups significantly improved in all four CQ domains compared to the comparison group (see Table 2). The effect size for the for CQ subdomains in the three-week program ranged from large to very large), which indicates that there is a strong association between the culture course/study abroad and student CQ growth. The effect size for the six-week program were all very large. For the comparison group, the effect sizes were all classified as very small, indicating a weak association between the program and CQ growth.

Three Weeks Abroad				
	T1	T2	Change Score	Effect Size[3]
Motivation[1,2]	5.53 (0.24)	6.00 (0.69)	+0.47	0.91 (large)
Cognitive[1,2]	3.46 (0.49)	5.10 (0.36)	+1.64	3.81 (huge)
Metacognitive[1,2]	4.84 (0.40)	5.86 (0.26)	+1.02	3.02 (huge)
Behavior[1,2]	4.09 (0.49)	5.55 (0.36)	+1.46	3.39 (huge)
Six Weeks Abroad				
	T1	T2	Change Score	Effect Size[3]
Motivation[1,2]	5.77 (0.18)	6.16 (0.26)	+0.39	1.74 (very large)
Cognitive[1,2]	4.02 (0.34)	5.26 (0.36)	+1.24	3.54 (huge)
Metacognitive[1,2]	5.47 (0.29)	5.97 (0.32)	+0.50	1.64 (very large)
Behavior[1,2]	4.61 (0.54)	6.06 (0.38)	+1.45	3.11 (huge)
Comparison Group				
	T1	T2	Change Score	Effect Size
Motivation	5.35 (0.99)	5.36 (0.99)	+.01	0.01 (very small)
Cognitive	4.45 (1.29)	4.46 (1.29)	+.01	0.01 (very small)
Metacognitive	5.07 (1.27)	5.07 (1.27)	--	0.00 (none)
Behavior	4.60 (1.58)	4.58 (1.59)	-.02	0.01 (very small)

[1]Indicates significant within-group pre/post difference (p<.001)
[2] Indicates significant difference with comparison group (p<.001)
Cohen's d effect size scores: very small= .01, small=.2, medium=.5, large=.8, very large=1.2, huge=2.0 (Sawilowsky, 2009)

TABLE (2): TIME 1 (PRE), TIME 2 (POST) CQ SCORES, CHANGE SCORES, AND EFFECT SIZES

Between 3-and-6 Week Programs

Motivation CQ. As described in our methods section, motivation CQ was modeled using a two-hierarchical linear structure with time (pre and post) nested within each student (see Appendix A for the complete model results). When examining the unconditional means, the unconditional means was 5.87 regardless of group and there was a very small between-student variance (2.5%). For our Level 1 variables, time was a significant fixed effect (0.39, p <.001) but not significant as a random effect (0.41, n.s.). Thus, time as a random effect was removed from subsequent models. We then examined student characteristics as both fixed effects as well as interactions. Fixed and interactive models indicated no difference in motivation CQ development between students who participated in the three- and six-week programs for any of the student characteristics.

Cognitive CQ. The unconditional means for cognitive CQ was 4.49 (0.12), regardless of their cohort and the between student variance was extremely low (1.14e-26) which indicates that most of the effect on cognitive CQ is explained by within person factors (see Appendix B for the full Model). Level 1 variables showed that Time was significant as a fixed effect (p<.001), but not significant as a random effect (0.86, n.s.). Thus, time as a random effect was removed from our

subsequent models. After adding all predictors, we found no significant difference in cognitive CQ development between students who participated in the three- and six-week study abroad programs.

Metacognitive CQ. The unconditional mean for metacognitive CQ was 5.59 (see Appendix C for the full model). As in both preceding cases, the between-student variance was extremely low (6/62e-22), indicating nearly all the effect on metacognitive CQ is explained by within-person factors. Our models indicated that Time was significant as a fixed effect ($p<.001$), but not significant as a random effect (0.64, n.s.). Thus, Time as a random effect was removed from subsequent models. Then, we added all predictors into the model. Our Level 2 model showed that Program Length was a significant predictor of their metacognitive CQ (-0.41, $p < .001$), which indicates students who participated in the Japan study abroad group had significantly high metacognitive CQ at Time 1 than did the Europe study abroad group. We discuss the possible explanations for this finding in the discussion section. All other predictors were not significant. On average, students' metacognitive CQ increased by 0.73 ($p<.001$) from pre to post. Our final model added a cross-level interaction effect between students' metacognitive CQ growth from Time 1 (Pre) to Time 2 (Post) and Program Type. This model indicates after controlling for all level 2 variables, students in the three-week study abroad program significantly increased their metacognitive CQ by 0.56 points more, on average, compared to students in the six-week program.

Behavior CQ. The unconditional means for cognitive CQ was 5.12, regardless of their cohort and the between student variance was extremely low (1.88e-20), which indicates almost all of the effect on behavior CQ is explained by within person factors (see Appendix D for the full model). Level 1 variables showed that Time was significant as a fixed effect (1.36, $p<.001$), but not significant as a random effect 1.20, n.s.). Thus, time as a random effect was removed from our subsequent models. After adding all predictors, we found no significant difference in behavior CQ development between students who participated in the three- and six-week study abroad programs.

Discussion

We found that a combined cultural development course and short-term study abroad experience can have a significant impact on students' CQ development in all four CQ domains. Our results are consistent with the two

previous studies (Chang Alexander et al., 2021; Engle & Crowne, 2014). Our study extends upon this previous work by examining various short-term study abroad program lengths and CQ growth. Among the students who participated in either the three- or six-week study abroad, we observed no association between program length and motivation, cognitive, or behavior CQ development.

We also found no student characteristics (age, gender identity, race, year in school, first time overseas, major, or GPA) associated with any of the four CQ domains scores. However, we did observe a difference in metacognitive CQ, finding students who participated in the three-week study abroad program developed more than their six-week counterparts. Students metacognitive CQ change score for Europe (+1.02) was greater than the Japan program (+0.50)/ Although there was a change difference between study abroad programs, both programs significantly increased their metacognitive CQ relative to a comparison group. Additionally, when examining only post metacognitive scores, there were no statistically significant differences between the groups (Europe = 5.86 vs. Japan = 5.97), each group ended with similar levels of metacognitive CQ. The difference was a result of lower level of metacognitive CQ Pre scores (Europe =4.84 vs. Japan =5.87). This finding is supported by Rosenblatt et al. who showed that students who begin their program with a lower CQ catch up to their higher-CQ peers when they return from overseas. Thus, cultural development training seems to serve as an "experience equalizer" For students. Moreover, Mosakowski et al. (2013) concluded cultural training embedded within a program that students identify as meaningful or significant (e.g., studying abroad) seem to be more effective at motivating students to develop metacognitive strategies to interact in both the specific-cultural context they will experience abroad as well other cross-cultural settings encountered at home (Mosakowski et al., 2013).

For metacognitive CQ, no other student characteristics examined were significantly associated with CQ growth (age, gender identity, race, year in school, first time overseas, major, or GPA). While our study does not answer why we observed a difference in metacognitive CQ between the three- and six-week study abroad groups, it does highlight study abroad program locations may differ in some key features that may impact metacognitive CQ development. Several studies suggest metacognitive CQ may be linked to cultural contact experiences (Chang Alexander et al., 2021; Engle & Crowne, 2013; Li et al., 2013; Reichard et al., 2015; Shokef & Erez, 2008; Taras et al., 2013; Varela & Gatlin-

Watts, 2014; Wood & St. Peters, 2013) such as those encountered while studying abroad. According to Varela and Gatlin-Watts (2014), shorter program length and smaller cultural distance between home country and the study abroad location appeared to moderate the effects of metacognitive CQ growth.

While both the three- and six-week programs were designed to provide as similar as possible an experience in instruction and opportunities, one main difference between our programs that may be regarded as an indicator of cultural distance is foreign language. Foreign language proficiency was not a requirement of either study abroad, and most students did not speak the language(s) of their study abroad program location. Therefore, most students were only able to communicate with locals if they spoke English. Although students in the six-week program spent more time abroad, they may have encountered fewer opportunities to speak with locals as English fluency was less common in many of the regions throughout Japan. Additionally, beyond language skills, students bring to study abroad program their own biography, including their pre-conceived ideas, assumptions, and representations. This biography is likely to influence how a student approaches and immerses themselves in their study abroad experience, which likely effects CQ growth. More research is needed to uncover situational factors surrounding study abroad locations that may impact CQ.

Strengths, Limitations, and Future Research

Our study has important strengths and limitations that may provide guidance for future research. One strength of our study was that it was the first to examine the association between study abroad program length, after students completed a shared cultural training program. Another strength of our study was our quasi-experimental design, which allowed us to test the effects of our program using two experimental groups and a control group. Third, we used multilevel modeling to account for several potential confounding student-level and program-level characteristics. Multilevel modeling is a strong set of techniques that can analyze data on individual change (Raudenbush & Bryk, 2002). In this analysis, multilevel modeling helped avoid several potential dataset limitations. Multilevel modeling excels for analyzing datasets with only two time-points, which can be insufficient for studying individual growth over time (Raudenbush & Bryk, 2002). Furthermore, Time 1 (pre) and Time 2 (post) data for both study groups and the comparison group were not collected concurrently. Multilevel modeling addressed these issues by scaling the CQ

instrument in order to maintain constant variance over the data collection time points, to avoid difficulties when measuring determinants of change (Raudenbush & Bryk, 2002).

We recognize our study has important limitations that may provide guidance for future research. Our study only collected data at two time points – once prior to the cultural development course and again after the completion of the study abroad program. Accordingly, we are unable to distinguish how much of our students' CQ development is due to the cultural development course and how much is due to the study abroad program. This limitation makes it difficult for us to compare our findings directly to studies that only observed either cultural development courses or study abroad programs. Future studies that incorporate combined interventions should add a third time point between the cultural training course and the study abroad to better understand the unique influence of each intervention type.

Furthermore, study abroad programs that differ in location may offer different opportunities for CQ development. For example, in our study, the students who participated in the three-week program to Europe encountered more people who spoke English than the students on the six-week program to Japan. Accordingly, while we discussed how this difference in our own program locations may have influenced CQ, there may be additional differences. Future studies should continually incorporate study abroad location differences to determine which factors contribute to or hinder student CQ development. Although our sample mimics some of the demographics found for other CQ short-term study abroad programs and was representative of the racial composition of the university (e.g., predominantly White), the sample is not diverse racially. Although the student population comes from a large university with 79% of undergraduates studying STEM, our sample may not be generalizable to large universities because most of the students in the programs coming from STEM. Thus, the results may not apply to other study abroad programs and student populations. We also didn't collect other potentially useful information, such as, students who are on financial aid and/or receiving Pell grants. Future studies would benefit from exploring more diverse study abroad cohorts.

Conclusions

Our study also demonstrated students who studied abroad for three- or six-weeks improved in all four CQ domains relative to a comparison group. Further analysis revealed students in both study abroad groups experienced similar rates of increased motivation, cognitive, and behavior CQ. Metacognitive CQ increased significantly more for students in the three-week program, compared to students in the six-week program; however, Time 2 metacognitive CQ was not significantly different between groups. All observations comparing the three- and six-week programs persisted after controlling for student-level variables. Our study suggests participating in a semester-long cultural development course *prior to a* short-term study abroad increases undergraduate students' motivation, cognitive, metacognitive, and behavior CQ.

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Appendix A

	Unconditional Means (SE)	Level 1 Variables (SE)	Level 2 Variables (SE)	Interaction (SE)
Fixed Effects				
Time		0.39 (0.10)**	0.38 (0.11)**	0.31 (0.15)
Student Characteristics				

Program			-0.23 (0.13)	-0.30 (0.16)
Age			0.08 (0.06)	0.08 (0.06)
Ethnicity			-0.03 (0.05)	-0.03 (0.05)
Year in School			-0.06 (0.09)	-0.06 (0.09)
Gender Identity			-0.19 (0.12)	-0.19 (0.12)
1st Time Overseas			0.09 (0.13)	0.09 (0.13)
GPA			0.007 (0.11)	0.01 (0.11)
Time*Program				0.14 (0.21)
Intercept	5.87 (0.06)**	5.68 (0.07)**	4.51 (1.12)**	4.55 (1.13)**
Random Effects				
Intercept Variance	0.008 (0.05)	0.18 (26.62)	0.02 (0.04)	0.02 (0.04)
Time		0.41 (53.23)		
Residual Variance	0.33 (0.07)	0.05 (26.62)	0.27 (0.05)	0.27 (0.05)
ICC	0.025			
AIC	186.35	176.19	179.86	181.42
BIC	194.22	191.95	208.29	212.44

*p<.01, **p<.001

TABLE (3): CHANGE MODEL FOR MOTIVATION CQ OVER TIME

Appendix B

	Unconditional Means (SE)	Level 1 Variables (SE)	Level 2 Variables (SE)	Interaction (SE)
Fixed Effects				
Time		1.45 (0.16)**	1.45 (0.17)**	1.28 (0.24)**
Student Characteristics				
Program			-0.34 (0.20)	-0.49 (0.27)
Age			-0.02 (0.09)	-0.02 (0.09)

Ethnicity			-0.13 (0.07)	-0.13 (0.07)
Year in School			0.06 (0.15)	0.06 (0.15)
Gender			0.22 (0.19)	0.22 (0.19)
Identity				
1st Time Overseas			-0.27 (0.21)	-0.03 (0.18)
GPA			-0.03 (0.18)	-0.03 (0.18)
Time*Program				0.31 (0.33)
Intercept	4.49 (0.12)**	3.77 (0.14)**	5.17 (1.79)*	5.25 (1.79)*
Random Effects				
Intercept Variance	1.57e-26 (8.50e-26)	0.86 (59.98)	0.07 (0.14)	0.07 (0.11)
Time		0.98 (119.95)		
Residual Variance	1.39 (0.19)	0.17 (59.97)	0.68 (0.14)	0.67 (0.14)
ICC	1.16e-26			
AIC	326.69	277.02	271.12	272.25
BIC	334.56	292.77	299.56	303.27

**p<.01, ***p<.001

TABLES (4): CHANGE MODEL FOR COGNITIVE CULTURAL INTELLIGENCE OVER TIME

Appendix C

	Unconditional Means (SE)	Level 1 Variables (SE)	Level 2 Variables (SE)	Interaction (SE)
Fixed Effects				
Time		0.73 (0.14)**	0.71 (0.14)**	0.42 (0.19)
Student Characteristics				
Program			-0.41 (0.16)*	-0.69 (0.21)**
Age			0.08 (0.08)	0.08 (0.09)
Ethnicity			0.03 (0.06)	0.03 (0.06)

Year in School			-0.15 (0.12)	-0.15 (0.12)
Gender Identity			-0.11 (0.15)	-0.11 (0.15)
1st Time Overseas			-0.31 (0.17)	-0.31 (0.17)
GPA			-0.19 (0.14)	-0.19 (0.14)
Time*Program				0.56 (0.27)
Intercept	5.59 (0.08)**	5.23 (0.12)**	5.08 (1.44)**	5.23 (1.44)**
Random Effects				
Intercept Variance	4.68e-22 (3.19e-21)	0.64 (25.56)	0.01 (0.07)	0.03 (0.07)
Time		0.72 (51.11)		
Residual Variance	0.71 (0.09)	0.12 (25.56)	0.49 (0.09)	0.45 (0.09)
ICC	6.62e-22			
AIC	260.24	237.98	233.24	231.19
BIC	268.11	253.73	261.67	262.21

**p<.01, ***p<.001

TABLES (5): CHANGE MODEL FOR METACOGNITIVE CULTURAL INTELLIGENCE OVER TIME

Appendix D

	Unconditional Means (SE)	Level 1 Variables (SE)	Level 2 Variables (SE)	Interaction (SE)
Fixed Effects				
Time		1.36 (0.16)**	1.37 (0.16)**	1.25 (0.24)**
Student Characteristics				
Program			-0.52 (0.24)	-0.64 (0.29)
Age			-0.02 (0.17)	-0.02 (0.17)
Ethnicity			-0.09 (0.09)	-0.09 (0.09)
Year in School			0.07 (0.17)	0.07 (0.17)
Gender Identity			-0.07 (0.23)	-0.07 (0.23)

1st Time Overseas			-0.24 (0.25)	-0.24 (0.25)
GPA			-0.43 (0.21)	-0.43 (0.21)
Time*Program				0.23 (0.33)
Intercept	5.12 (0.12)**	4.44 (0.17)**	7.11 (2.13)**	7.17 (2.13)**
Random Effects				
Intercept Variance	1.88e-20 (1.29e-19)	1.20 (51.18)	0.24 (0.13)	0.24 (0.13)
Time		0.91 (102.37)		
Residual Variance	1.52 (0.21)	0.19 (51.18)	0.66 (0.13)	0.65 (0.13)
ICC	1.24e-20 (0)			
AIC	338.09	291.77	285.86	287.38
BIC	345.97	307.52	314.29	318.39

**p<.01, ***p<.001

TABLES (6): CHANGE MODEL FOR BEHAVIOR CULTURAL INTELLIGENCE OVER TIME

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Monica L. Miller is a Clinical Professor in the Purdue University College of Pharmacy. Dr. Miller also serves as a study abroad/international program lead as well as the College of Pharmacy's Intercultural Learning Liaison in both roles, she helps pharmacy students develop intercultural competence skills to effectively work with underserved populations domestically and globally. She is a Service Learning Faculty Fellow whose dedication to teaching, mentorship and work with the Purdue Kenya Partnership has been consistently recognized and celebrated.

John A. Gipson is the Director of Summer Session at Purdue University. The program runs the Think Summer program for students, including, Summer Internships and the Summer Stay Scholar Program. Dr. Gipson implements programs to reduce time to degree, increase affordability, and improve access to academic programs.

Charles A. Calahan directs Global Learning in the Center for Instructional Excellence at Purdue University. As an award-winning teacher in the College of Health and Human Sciences, his teaching and learning focused on active and experiential learning via advanced and innovative technologies. Since 2005, he was a paradigm pioneer at Purdue University in hybrid or blended learning. He is a Purdue University Diversity Fellow, Service-Learning Fellow, and a Member of the Purdue Teaching Academy.

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