Cultivating global mindsets without leaving campus: Building interculturally competent engineer

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***Abstract*—This innovative practice paper describes a one-year pilot program designed to intentionally develop intercultural competencies in undergraduate engineering students, without leaving campus. The design of the program was informed by theoretical frameworks about national cultural differences and development of intercultural competencies. The activities of the program included, but were not limited to, exposing students to other cultures, constructing active learning environments that simulated cross-cultural dialogues, reflection activities, and individual mentoring. The effectiveness of the program was assessed via pre- and post- assessments of intercultural competence using the Intercultural Development Inventory (IDI). The IDI scores from the final program evaluation indicated that most participants moved from a monocultural mindset towards the transition to a more global mindset after completing the program. Most importantly, the difference in pre- and post- IDI scores was statistically significant with a p-value < 0.001. This study offers implications for faculty and staff, who are involved in developing globally competent engineers by modeling how to equip students to lead diverse engineering teams, and build effective strategies for conflict resolution, without leaving campus. The effectiveness of the activities, limitations of this research, and future directions of the program are discussed.**

Keywords— Intercultural Competence, Intercultural developmental Inventory (IDI), Campus internationalization, global engineer, global mindsets, on-campus programs

I. INTRODUCTION

Meeting the challenges of increasingly globalized environments, many higher education institutions are actively seeking ways to develop culturally competent graduates through their curricular and co-curricular efforts [1]. Many higher education institutions have traditionally focused their efforts on sending students abroad. This opportunity for transformative learning, addressing the development of intercultural competence in undergraduate students, can be challenging. Many institutions and faculty assume that study abroad gives students an experience in another culture that is meaningful. However, studies show that this experience does not increase intercultural competency, unless an intentional, guided, reflective, experiential learning based on sound theory is included [2]. While the traditional approach for cultural competency development is through study abroad programs, increasing numbers of program efforts are in place to increase campus internationalization. In 2014, Soria et al. reported that students who participated in learning communities, international/global performances, workshops or conferences, first-year seminars, service-learning, and common book reading programs were more likely to report development in intercultural skills than their peers who did not participate in these activities [3]. While many on-campus programs designed to increase intercultural knowledge, skills, and attitudes report students' self-perception of competence levels, there is no evidence in the literature about intentionally designed on-campus programs that use validated measurement tools to assess gains in intercultural competence. Further, the leading scholars state that intercultural development should be assessed by validated tools and measured using mixed methods [4]. Moreover, intentionally addressing intercultural development at higher education institutional programs, orientation, and courses are imperative for both domestic and international students as they graduate to be global-ready students [5]. Specifically, in the context of engineering education, the National Academy of Engineering (2005) concludes that "U.S. engineers must become global engineers .... The engineer of 2020 and beyond will need skills to be globally competitive over the length of her or his career [6]" Moreover, the National Association of State Universities and Land Grant Colleges' Committee for International Education, prepared a summary of the characteristics that define a globally competent student [7]. As per the committee report, a globally competent student has the following five characteristics: (i) Has a diverse and knowledgeable worldview; (ii) Comprehends international dimensions of his/her major field of study; (iii) Communicates effectively in another language and/or cross-culturally; (iv) Exhibits cross-cultural sensitivity and adaptability; and (v) Carries global competencies throughout life [7].

The need to cultivate a global engineer stems not only from the national accreditation boards, industries, and universities, but also from the demands of the changing world economies. Higher education institutions will need to find innovative ways to develop global competencies beyond traditional approaches, such as sending U.S students abroad.

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The Cross-Cultural Leadership Program (CCLP) described here is an innovative approach to on-campus development of intercultural competence.

II. THEORETICAL FRAMEWORK

There are numerous theoretical models and frameworks that address different aspects of intercultural competence. There are developmental models, such as the Developmental Model of Intercultural Sensitivity by Bennett [8], and the Intercultural Maturity model by King and Baxter Magolda [9] that explain the different developmental stages of intercultural competence. Other models use a Cognitive/Affective/Behavioral (CAB) approach or a Knowledge, Attitudes and Skills (KAS) approach to conceptualize the development of cultural competence. The work conducted by Darla Deardorff [10], the Intercultural Knowledge and Competence VALUE rubric by the AAC&U [11], and the work of Hofstede [12], are examples of these types of models. Other models deal with identifying critical factors in which cultures differ from each other. These models bring awareness about one's and other's cultural norms and provide a knowledge frame on how to appropriately interact across cultures. Among those models, there are the Hofstede's model of cultural differences [12], the Global Leadership and Organizational Behavior Effectiveness Research program (GLOBE) [13], Hall's Cultural Factors - Cross Cultural Theory [14], Trampenaars and Hampden-Turner's Seven Dimensions of Cultures [15] and Kluckhohn & Strodtbeck Values Orientation Theory [16].

The CCLP program described in this paper was designed around three theoretical frameworks. The first two frameworks - the Intercultural Knowledge and Competence VALUE Rubric, and the Intercultural Development Continuum (IDC) - are meant to describe and assess growth in intercultural competence from a developmental and KAS approach. The third model used in this program - the Hofstede's model for cultural differences - is intended to conceptualize cultural differences. These frameworks are described in detail below.

A. Intercultural Knowledge and Competence VALUE Rubric (AAC&U VALUE Rubric)

The Intercultural Knowledge and Competence VALUE Rubric, released in 2009 by the Association of American Colleges and Universities (AAC&U), is meant to be a tool to operationalize constructs describing Intercultural Competence [11]. At the same time, it provides a framework to understand what Intercultural Competence is, and which are the knowledge, attitudes, and skills (KAS) inherent to it. Intercultural Competence is defined as "a set of cognitive, affective, and behavioral skills and characteristics that support effective and appropriate interaction in a variety of cultural contexts" (from Bennett, J.M. 2008, transformative training: Designing programs for culture learning, cited in AAC&U, 2014). The KAS identified by the rubric are [11]: two types of knowledge, i.e. self-culture knowledge and awareness, and knowledge of cultural worldview frameworks; two skills, i.e. Empathy, and Verbal and non-verbal communication; and two Attitudes: Curiosity and Openness. The CCLP activities were designed to address all of the KASs presented in the rubric. The descriptions provided by the rubric about the expectation for each KAS, in each level of mastery, were instrumental in a proposed understanding which kind of activities were more suitable for the students, considering student's intercultural competence level in the IDC, and the KAS that they needed to develop to move up in this continuum.

B. The Intercultural Development Continuum (IDC)™

The Intercultural Development Continuum (IDC)™ is derived from the Developmental Model of Intercultural Sensitivity (DMIS), proposed by Bennett [8]. The IDC explains the different stages that people go through when developing cultural competence [17]. This model understands the development of intercultural competence to happen in a continuum, ranging from an ethnocentric or a monocultural mindset transitioning to an ethnorelative or a global mindset. People move along the IDC as their understanding of their experiences with cultural differences becomes more complex and sophisticated [17]. The IDC model identifies five possible orientations or stages of cultural competence [17]: 1) Denial, in which people are unable to recognize the existence of other cultures but theirs. 2) Polarization, where people are good at recognizing cultural differences but with a stereotypical judgmental attitude that leads to the division between "us" and "them." 3) Minimization, where people tend to minimize or oversimplify cultural differences and focus on similarities across cultures. 4) Acceptance, where people recognize and understand the complexity of cultural differences, but still struggle with properly navigating in others' cultures. 5) Adaptation, in which people recognize the perspectives from different cultures and change their behavior to efficiently and properly engage with other cultures. In doing so, people are capable to serve as bridges across cultures. Each orientation represents a way of seeing the world, a worldwide structure, as Hammer et al. calls it [18]. Behaviors and attitudes of people in a certain orientation reflect the way they understand the world and make meaning of cultural differences and commonalities.

C. Hofstede's Model for Cultural Difference

The Hofstede model was used in the program to provide students with the knowledge about the characteristics - similarities and differences - of their culture and other cultures with respect to each other. The Hofstede's model for cultural differences is one of the simplest and most widely used models for this purpose. This model proposed that there are six independent dimensions in which national cultures can differ from each other [12]. These dimensions are [12]: 1) Power distance: the preference of people from a culture to have, and accept, either hierarchical or flat social structures. 2) Individualism: or collectivism, depending on the degree of importance given to the individual or to the group in the society. 3) Masculinity: or femininity, depending on the extent people in a culture prefer distinctive gender roles versus interchangeable or not defined gender roles. 4) Uncertainty avoidance: the degree to which people from a culture embrace and feel comfortable with uncertainty or, on the contrary,

avoid it. 5) Long-term orientation: or short-term orientation depending on the importance that a society place on its traditions and roots from the past or to the realities of the immediate present and future. 6) Indulgence: or restraint, depending on whether a society indulges human pleasures or has in place strict social rules that restrain them. In Hofstede's model, each country has a score from 0 to 100 in each cultural dimension [12]. Differences in scores in a dimension represent differences in the cultural values, beliefs and behaviors of a culture with respect to another. These differences have implications in the way people from one culture or another see the world and react to situations.

During the training sessions of the program, relevant elements from each theoretical framework were aligned with Vande Berg's four-step process to implement intercultural competency [19]. The four core intercultural competencies are based on the principle of "Interacting more effectively and appropriately with culturally different others—bridging cultural gaps"—means 1) Increasing cultural and personal self-awareness through reflecting on our own experiences, past and present; 2) Increasing awareness of others within their own cultural and personal contexts 3) Learning to manage emotions and thoughts in the face of ambiguity, change, and challenging circumstances & people 4) Learning to shift frames, attune emotions and adapt behavior to other cultural contexts.

III. Participants and Methods

A. Participants

Participants of the study were 14 students in the College of Engineering at a research institution located in the Midwest. An email inviting students to apply for this program was sent to all the juniors in the School of Industrial Engineering. Upon receiving the applications students were interviewed by the program administrators to gauge their commitment for a year-long program. Demographic information of the participants, including their gender, age, citizenship, ethnic minority status is shown in Table I.

TABLE I. DEMOGRAPHIC INFORMATION OF THE CCLP PARTICIPANTS

Sample	Gender	Age	Country of Citizenship	Ethnic Minority
N=14	43% Female 57% Male	79% 18-21 21% 22-30	86% USA 7% India 7% China	21% Yes 79% No

Of the 14 students participating in the program, 36% have never lived in another country, 29% have lived in another country for less than 3 months, 14% indicated that they have lived 3-11 months in a different country and 21% of the participants have lived in another country for 3-5 years. 79% of the students also reported that they have spent their formative years up to age 18 in North America, 14% in the Asia Pacific region, and 7% in the East European region.

B. Program Goals and Description

The objectives of this program were to develop and improve an attitude of intercultural openness, an attitude of intercultural curiosity, knowledge of cultural self-awareness, knowledge of cultural worldviews, skills of intercultural empathy, and skills of intercultural verbal and nonverbal communication. The goals of the program were to: capitalize on competency development through (1) the exchange of cultural values through domestic-international student partnerships, (2) guiding domestic and international students to cross cultural boundaries, (3) eliminating social barriers, and (4) fostering intellectual discussions through organic relationship building activities. Progress towards these goals were achieved by introducing learners to the topics, experiencing culture, and reflecting as a group, individually, and one-on-one.

C. CCLP Structure

The program consisted of ten modules over the course of a Fall and a Spring semester, designed in conjunction with the Center of Instructional Excellence (CIE) at Purdue University. Each module included a training session and a reflection assignment. In addition, students were required to engage in social activities with culturally different peers. The time commitment required about two hours per month attending training sessions, two hours per month completing assignments, and participation in a group social activity. The time commitment was about 20 hours per semester or 40 hours total. Participants of this program were awarded a certificate for successful completion of intercultural modules, engaging with cross-cultural social activities and reflections exercises. The topics of each of the modules are presented below:

Module 1: Cultural Self Awareness
Module 2: Cultural Worldviews
Module 3: Intro to IDC/IDI (Pre-Group Profile Debrief)
Module 4: Intro to Hofstede's Model for cultural difference
Module 5: Intercultural Conflict Styles
Module 6: Intercultural Openness
Module 7: Intercultural Empathy
Module 8: Intercultural Curiosity
Module 9: Intercultural Communication Styles
Module 10: IDI Post Group Profile Debrief

The training sessions included an active learning activity and a debrief or discussion of the activity by the cross-cultural facilitators. The activities involved the learners directly, with the purpose of engaging the students on a cultural level. The facilitators created an open environment, allowing students to openly reflect and comment on the cultural topics. A recurring theme of the training sessions, regardless of the specific topic, was to emphasize the four-step process to implement intercultural competency as identified by Vande Berg [19]. Two examples of the kind of active learning activities used in the training sessions are presented below:

Example Activity for Module 7: Intercultural Empathy: The students were asked to read an intercultural parable. The students individually ranked the most moral character in the story to the least moral character in the story. They were then asked to interact with students that had similar rankings, listing the reasons as a group to prove their beliefs. The students were then instructed to explain why that character is actually the opposite in morality and persuade the rest of the members as to why. The students were encouraged to reflect on their biases, judgements, and pre-conceived stereotypes. Through this activity, empathy is not only understood, but also practiced.

Example Activity for Module 9: Intercultural Communication Styles: Each student was assigned to a type of communication such as interrupter, pauser, and turn-taker. The students are asked to have a discussion with a small group by using their communication style. Through the activity, students become frustrated, uncomfortable, and confused. Following the discussion, the students were asked to reflect on each communication style and the way it affected their conversation. The entire group of students were asked to take a quiz on communication. The questions stimulated conversation about how different cultures communicate differently in personal, business, and family relationships. The diversity in the group encouraged discussion and examples that helped students see communication from different cultural perspectives.

Reflections and one-on-one coaching: After each training session, the students completed an individual assignment with the intent to reflect on a deeper level. The assignments typically asked the student to execute an interview or a personal activity, and then reflect on the experience. The reflections are based in the context of the training module, prompting the student to consider how their cultural identity affects their experience. Both of these forms are beneficial, but the most effective form of reflection in CCLP is the one-on-one debriefs. Each learner had the chance to dig deeper into their own cultural identity. The learners tend to reflect more deeply on where their improvements will need to come from and why they are where they are. The one-on-one interactions allow each learner to be heard, helping the facilitator to understand where they are at on a cultural level. The facilitator was also able to gear questions towards their intercultural mindset that sets them up to develop intercultural competencies.

As part of their training, students completed the Intercultural Development Inventory IDI [18] as a teaching-learning tool. There was an IDI debrief on the combined group results. In this session, conducted during Module 3, the IDI framework was explained in detail to the learners, as they participated in activities to understand each mindset. To receive their individual IDI results and action plans, the learners had one-on-one discussions with an IDI Qualified Administrator (QA) to review and understand the meaning behind their intercultural mindset. Students received their own individualized Intercultural Development Plan (IDP). The IDP included a personalized five-step process to build an intercultural development plan.

Cross-Cultural Social Activities in the Community: A part of the requirement to receive the cross-cultural learner certification is monthly participation in group, social, cultural activities. Participants were given $50 to cover the cost associated with intentional social activities with culturally different peers. Using events on-campus as well as in the community, CCLP encouraged students to experience and learn about another culture. The Malaysian Carnival was a cultural event that allowed students to taste the food of Malaysia and learn about the culture from Malaysian students on-campus. The Taste of Asia was another event that students attended to eat the food of and interact with different Asian cultures. Participation at these events allowed students to think about their intercultural curiosity and openness.

D. Assessment of Intercultural Competence Structure

The intercultural competence of students was assessed using the IDI v3, Educational version [18]. The IDI is a tool designed to measure Intercultural competence based on the developmental orientations proposed in the IDC model [17]. This instrument identifies five possible orientations in the Intercultural Developmental Continuum: 1) Denial, 2) Polarization, 3) Minimization, 3) Acceptance, and 5) Adaptation.

A pre-program IDI test was administered to students at the beginning of the program, by a IDI qualified QA to assess their initial cultural competence level and to guide the discussions held in the training sessions. A post-program administration, at the end of the program, was used to determine the effectiveness of the program to increase students' intercultural competence on-campus. The IDI was taken by 14 students. Analysis of student's responses to the 50 questions of the IDI survey was conducted by IDI, LLC. After analysis, each student was provided with an Individual IDI profile report, and the program was provided with a Group Profile report. Each report contained two IDI scores, i.e., a Perceived Orientation score (PO) – a perception of where people think they are in the IDC – and a Developmental Orientation score (DO) – where people actually are in the IDC. After the pre- and post-program IDI administrations, a IDI qualified QA conducted individual and group debriefs about the IDI individual and group scores with the students.

IDI Data Analysis: Pre-and post-program scores of the IDI were compared for individual students and for the group. Individual results were used as reported by IDI, LLC. The group pre- and post-program IDI scores were calculated as the arithmetic mean and standard deviation of the 14 students who took the IDI survey. A two-tailed, paired t-test for comparison of means was used to determine the significance of the differences in IDI scores between the pre- and post-program administrations for the Perceived Orientation and for the

Developmental Orientation. The normality of the data was verified by calculating the skewness and the kurtosis of the data, by visual inspection of probability plots and by checking the random distribution of the residuals in the residuals plots.

IV. RESULTS

A. *Students started the program with a monocultural mindset*

The IDI scores collected at the beginning of the program showed that most of the students started the program with a mindset in the beginning of the transition to a global mindset, although they perceived their intercultural competence to be significantly higher. Initial IDI Perceived Orientation (PO) scores showed that most students perceived their intercultural competence to be in high *Minimization* or *Acceptance* orientations. The Developmental Orientation (DO) scores showed that students were in transition to an ethnorelative mindset. (Fig. 1). According to the DO scores, at the beginning of the program approximately 1/3 of students were in the *Polarization* orientation and 2/3 of the students were at the lower edge of the *Minimization* orientation, which places most of the students in a transitioning mindset (Fig. 1). The DO scores were used to establish an intercultural competence baseline for the program, and for each student.

B. *Students participating in this program moved up in the intercultural developmental continuum*

The post-program IDI scores, both from the Perceived Orientation (PO) and the Developmental Orientation (DO), showed an increase in the cultural competence of most of the participants. As shown in Fig. 1, at the end of the program there were more participants in the highest stages of intercultural competence, i.e. Acceptance and Adaptation, compared to the pre-program IDI administration. In addition, the percentage of participants in the mindset orientations of Polarization and Minimization) was lower in the post-program IDI administration than in the pre-program administration. These results suggest that, in general, participants moved up in the IDC, with some of them transitioning from one stage of Intercultural Competence to another. As a matter of fact, the IDI DO results showed that of the 14 participants who took the IDI pre- and post-tests, 3 of them moved up to the next orientation of Intercultural Competence, another 3 participants moved up two orientations of Intercultural Competence, and 2 participants stayed in the Minimization orientation. The remaining six students stayed in the same Intercultural Competence orientation, with five out of six showing positive increases in their IDI DO scores, just not enough to change to the next intercultural developmental stage.

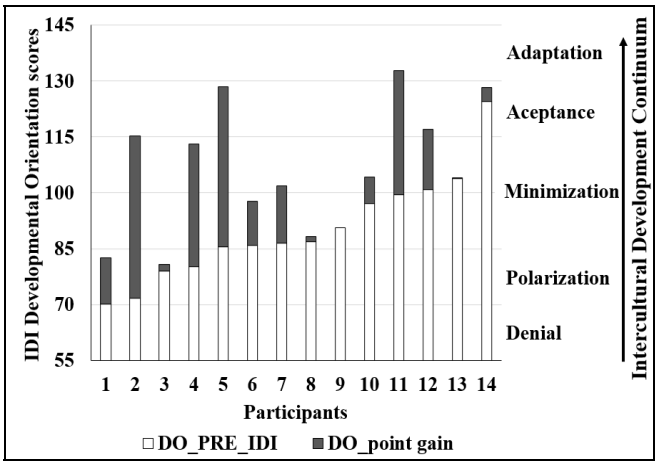

Fig. 1. Gains in students' Intercultural Competence measured by IDI Developmental Orientation IDI scores

In most cases (11 students) the PO scores of students was closer to the DO scores in the post-program evaluation than in the Pre-program evaluation. This result might suggest greatest awareness of cultural competence in students after completion of the program.

C. *The group results show a transition from a monocultural to a global mindset*

The average results of the pre- and post- administrations of the IDI allowed the administrator to understand how participant collectively perceived cultural differences and commonality when they started the program and when they finished it. The IDI group scores for PO and DO show an increase in intercultural competence in the group, within the Minimization orientation. The differences between the pre-and post-administration IDI results for the PO and the DO are roughly equivalent to a one standard deviation of the pre-program administration results (Table II). These differences are statistically significant with a p-value < 0.001. Based on the literature findings, this is the first time that this kind of result has been reported for an on-campus intercultural competence development program. Although the increase in the collective intercultural competence was not enough to move up to the next intercultural developmental orientation, the DO scores indicate that the group transitioned from a low *Minimization* orientation to a significantly higher transitional mindset.

TABLE II. GROUP IDI SCORES OF PRE- AND POST- PROGRAM. *: P-VALUE < 0.01.

	Pre-program	**Post-Program**	**Difference**
IDI Scores	Mean ± Std. deviation	Mean ± Std. deviation	Mean
Perceived Orientation (PO)	120.90 ± 5.75	129.11* ± 8.92	8.21
Developmental Orientation (DO)	90.19 ± 14.25	105.80* ± 17.38	15.61

V. Discussion

Developing culturally competent graduates are mission critical for higher education institutions [20]. Numerous research studies and business case studies indicate the need to employ staff who have the ability to work with individuals and organizations from cultural backgrounds different from their own. Further, employees who lack intercultural skills can cause problems, including damage to an organization [21]. The most significant finding of this study is that cross-cultural competence can be improved significantly on-campus, when programs for this purpose are intentionally designed. Although there are numerous programs in place to increase the exposure to cross-cultural learning though learning communities, international/global performances, workshops, conferences, first-year seminars, service-learning, and common book reading programs, many of those studies report the student's self-reported data on intercultural knowledge, skills and attitudes as opposed to use validated assessment tools. The average IDI point gain of +15.61 reported in this study for the CCLP program is comparable to, and in some cases higher than, the IDI average gains observed in traditional study abroad programs, as reported in literature (Table III). The Georgetown Consortium Study looked at 60 study abroad programs and had very limited intercultural interventions on site. Programs relied principally on immersion in another culture for learning, but generally did not provide intercultural interventions or facilitation. The average gain of +1.32 was very small [22]. The University of the Pacific study represents a comprehensive intervention that consists of semester-long pre-departure and re-entry courses plus a study abroad in the context of an internationalized academic program (2-3 years). Intercultural conversations are woven into the fabric of the course, so there were ongoing formal and informal cultural mentoring; the average gain was significant at +17.50 [23]. Also, other short term 3-4 week global seminars led by the faculty have also seen low IDI point gains of +6.7 [24].

Through the IDI, changes in the intercultural competence in the group and individuals over time were detected and quantified. The individual growth in affective, behavioral and cognitive domains was a substantive finding that was only captured during post-IDI individual debriefs, reflections, and testimonials. The trainings that were put together to develop self-awareness, worldviews, empathy, openness, curiosity and communication (intercultural KAS) greatly impacted students' overall development, hence influenced students' growth along the IDC. For instance, a reflection of a student's affective and cognitive development can be seen in the following statement "Being a part of CCLP has helped me understand how people from different cultures think and behave, and what the reason behind them is behaving like that. I feel this type of training is a very important part of being an all-rounded engineer."

TABLE III. AVERAGE IDI POINT GAIN IN STUDY ABROAD PROGRAMS. SOURCE: [25]

Study Abroad Program - Report	IDI Point Gain
Georgetown Consortium Study (60 Progs)	+1.32
University of Minnesota Maximizing Study Abroad	+3.82
Bellarmine University and Willamette University	+8.19
Council of International Education Exchange	+9.20
University of Minnesota, Duluth	+11.56
American University Center of Provence	+12.50
Westmont in Mexico	+14.40
University of Pacific	+17.50

Another participant of the program also reflected her appreciation of the program through the following lens. "I got involved with CCLP, because I love culture, diversity and travel. However, this program is much more than that… it has given me the skills to constantly grow in my ability to understand and accept diversity. Through the training and group events, I have gotten unique opportunities to reflect on how I see cultural differences and how I identify with my own."

Overall, the positive changes on individual and group level are significant. The pilot study proved that intentional design of an on-campus program could achieve the results similar to an intensive study abroad program. It is also reasonable to state that the degree of mentoring participants is a crucial element of the success of the program. The degree of mentoring was not operationalized and evaluated using a validated tool. Therefore, it may be seen as a study limitation. However, many intercultural experts and leading scholars in the field agree that intercultural development by cultural mentoring will meaningfully increase individual intercultural growth [24], [25].

This study offers implications for faculty and staff who are involved in developing globally competent engineers. The training modules used in the CCLP program can be integrated as a part of the pre-departure preparation for study abroad, so students have the basic knowledge, skills, and attitudes to make the best out of their time abroad. The training modules are also instrumental for faculty and instructors who want, or have the need, to bring conversations about working across cultures into their classroom discussions. The training modules are also useful for those on-campus who manage diverse teams and projects. They can benefit from taking the modules, so they have a better understanding of their own intercultural competence, understand the challenges of that the teams might face, and become equipped with tools to coach and foster healthy and effective team development. Finally, for students, the knowledge gain through the CCLP training will be beneficial for leading diverse engineering teams, building effective strategies for conflict resolution and making decisions in diverse environments.

VI. Limitations and Future Directions

The success of the program described in this paper shows that it is possible for students to develop intercultural competence without leaving campus. The pilot program described here has limitations that need to be addressed. First, student's previous experiences with other cultures might influence their ability to develop intercultural competence. In this study, we did not control for students' previous experiences and how they might affect the results. In the future, such background information can be useful to better understand the results of the program. Second, the participants of the study came from a single engineering discipline, Industrial Engineering (IE). This had a positive impact in the group's cohesion, since the participants knew each other, shared similar experiences in their classes, and could easily find common topics of conversation. As a result of the strong team cohesion, students actively participated in the discussions held in the training sessions and in the other activities of the program. A different dynamic might be seen when students from different majors, who do not know each other, participate in the program. Third, participation in the program was voluntary, therefore, there was a motivation on the part of the students to participate in this program. Motivation is a key element for the success of any instructional program. This is a factor to consider when thinking about expanding the program and/or making it mandatory for students. Finally, scalability of the program as it is might be challenging, due to the amount of resources needed, specifically, economical resources to pay for the IDI and the Intercultural Conflict Style Inventory, and time and qualified personal resources to do the individual debrief of the IDI results and the one-on-one coaching for the program. IDI do offer discounted prices for research and educational purposes. Alternatives to use technology and virtual reality, instead of the individual coaching, are currently being researched by other research groups. In addition, engineering specific modules to address intercultural constructs might also help engineering students to relate and make meaning out of the training. This study offers directions for faculty and staff who are involved in developing globally competent engineers by modeling how to equip students to lead diverse engineering teams and build effective strategies for conflict resolution, as well as providing a basis for future initiatives to increase intercultural competencies and their applications in engineering team dynamics and decision-making. In the future, it will be interesting to study a cohort of engineering students from various disciplines, conduct a comparative analysis, and also to study potential gender differences in intercultural learning.

VII. Conclusions

This paper describes an effective, innovative on-campus program intentionally designed to increase students' intercultural competence without leaving campus, but capitalizing on the diversity of the student-body. The traditional approach to develop intercultural competence has been study abroad. The program described in this paper is the first on-campus program that shows significant growth of students' cross-cultural competencies, measured using a validated assessment tool – the IDI. The gains (+15.61) in intercultural competence reported by the CCLP program are comparable to those reported by very structured and long term study abroad programs. This program opens the door for development of intercultural competence for students who do not take the advantage of study abroad programs.

In the current discourse of preparing globally competent engineers, practitioners and scholars agree on the importance of developing engineers who (i) Have a diverse and knowledgeable worldview; (ii) Comprehend international dimensions of his/her major field of study; (iii) Communicate effectively in another language and/or cross-culturally; (iv) Exhibit cross-cultural sensitivity and adaptability; and (v) Carry global competencies throughout life. It was evident from the CCLP program results that the program directly contributes to cultivating globally competent engineers. Thus, this program caters to the agenda of higher education institutions to develop intercultural competence in a manner that is more accessible for everyone, on-campus. This kind of program also helps to cultivate internationalization efforts on-campus because they strengthen the international and domestic students' academic and non-academic partnerships.

In conclusion, this study affirms the possibilities of cultivating global mindsets through an on-campus initiative that is intentionally designed using existing theory and practice. As the socio-economic environment calls for globally competent engineers, higher education institutions will be forced to quickly respond either by revamping their existing curriculums and/or by utilizing programs like CCLP to produce globally competent engineers.

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