

Identification of Midwest Engineering Student Cross-Cultural Experiences

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Abstract

This study investigates undergraduate student perspectives on which of their life experiences have helped them strengthen their cross-cultural competence. A survey was administered to 272 students in a first-year interpersonal skills course at a large, land-grant university in the Midwest, focusing on their personal experiences related to intercultural competence development. An analysis of qualitative, open-response data identified that friends and interpersonal relationships (26%), school experiences (24%), and living in diverse environments (22%) were the most influential factors. These findings highlight the importance of fostering diverse interactions within educational settings to enhance intercultural competencies. By understanding and building upon students' existing experiences, engineering education can better prepare graduates for the global workforce. This research underscores the need for accessible methods to help students develop intercultural competence beyond traditional study abroad programs.

Keywords

Undergraduate student poster, intercultural communication, cultural competence, professional skills, undergraduate

Introduction

In today's interconnected world, engineers need both technical expertise and intercultural competence. The Accreditation Board for Engineering and Technology (ABET) emphasizes a broad education by promoting global awareness for career success, aligning with national calls for engineering students to develop intercultural competence [1]. Employers seek graduates who can work effectively with colleagues and clients from diverse cultural backgrounds, a critical for many domestic and international projects [2]. Thus, fostering intercultural competence in engineering students is essential for their professional development.

While study abroad experiences have traditionally enhanced students' intercultural competence, engineering students often face barriers such as financial constraints and rigid curricula timelines, making extended international experiences challenging [3]. Therefore, alternative accessible methods must be explored. There has been work on such alternatives, such as cultural simulation activities and virtual exchange programs [4], [5]; however, there is still a need to understand students' backgrounds before these activities. This understanding will help provide complimentary experiences that build on their existing exposure to intercultural contexts and address specific gaps in cultural knowledge and skills. To address this need, we pose the following research question:

According to engineering undergraduates in a first-year interpersonal skills course at a large, public, land-grant university in the Midwest, what life experiences have allowed them to strengthen their cross-cultural competence, if any?

As demand for globally competent engineers grows, engineering education must evolve to provide students with the skills to thrive in diverse environments, preparing them for the challenges and opportunities of the global workforce.

Methods

In the fall of 2023 and spring of 2024, authors Fitzpatrick and Deters distributed a survey to a first-year engineering course focused on interpersonal and leadership skills at a large, public, land-grant university in the Midwest. This course emphasizes the development of professional skills critical for future careers through several topics, including servant leadership, social capital, conflict resolution, cross-cultural communication, and power and influence. This survey, administered during the cross-cultural communication unit, aimed to capture student perceptions of cultural competence by inviting them to share their individual experiences. The study analyzed responses from $n = 272$ participants to the open-ended question: “What life experiences have allowed you to strengthen your cross-cultural competence, if any?”

Student responses were inductively coded by authors Fitzpatrick and Mann to identify common experiences. The top ten life experiences were then discussed and refined to establish a consensus and define a codebook. Fitzpatrick and Mann reviewed the codebook and the scope of each experience with Petersen before using the codebook to code the data. The author team regularly checked in throughout the coding process to ensure consistency and alignment.

Findings

Table 1 depicts the most common life experiences that participants believed contributed to their cultural competence. We discuss the themes that appeared in at least 15% of participants responses.

Friends & Interpersonal Relationships

70 of the 272 participants (26%) noted their experiences with friends and other interpersonal relationships as an influential factor in the development of their cross-cultural competence. Four participants specifically mentioned values. For example, a participant reported that their development came through “getting to know the people and the values that they hold.” Three other participants shared that they were exposed to different cultures through visiting their friends’ homes. One participant wrote, “I have friends from many different religious and ethnic backgrounds, and I have experienced different cultures and traditions in their homes.”

Another noted that “making friends with people of other cultures taught me some really great activities and cuisines.” Perspective was repeated three times. One participant wrote that their interpersonal relationships allowed them to “gain more perspective of how other people act and why they act that way.”

School Experiences

Next, 65 of the 272 students surveyed (24%) expressed that their school experiences played a significant role in their ability to learn from and communicate with cultures other than their own. Two students directly reported that time spent in laboratories was influential. One participant wrote that “labs at college have a very diverse group, specifically physics, so it allows me to work with other people.” 16 students mentioned the diversity of their high school. One wrote that they “went to a high school with a very wide array of economic and social background” and that

they “also participated in both artistic and athletic programs, giving [them] different experiences with people.” Similarly, another wrote “Attending public schools my whole life has strengthened my cross-cultural competence because of the different students and organizations available.” There were also three students who mentioned the foreign exchange program at their schools. One reported, “my high school had a foreign exchange program with Norway, so meeting these people and understanding how their lives were different was very enlightening.” Perspective was also brought up in relation to schools with a student writing that their cross-cultural development came from “collaborating with various cultures perspectives amongst my peers.”

Table 1. Identified Common Life Experiences

Life Experience	Definition	Participant (out of 272)	Salience (%)
Friends & Interpersonal Relationships	Getting to know people with various backgrounds, especially different from them	70	26
School Experiences	Interacting with peers, professors, and graduate students in college / high school	65	24
Living in Diverse Environments	Experiencing different living environments, whether domestic or international	62	22
Travel	Travelling outside of their home state and learning how others live in different contexts	45	17
Work Experiences	Working in various environments with people different from them	44	16
Participation in On-Campus Clubs	Participating in clubs on campus that emphasize and promote diversity	34	13
Family Background & Cultural Identity	Embracing their family’s background and identity from a different culture	30	11
Volunteering / Community Service	Volunteering with various communities that may be different from their own	19	7
Language Learning & Education	Engaging in language learning courses and clubs, whether they are teaching or learning	13	5
Military Experience	Involvement with the military has immersed them in various environments	7	3
None	They do not believe they have had experiences to strengthen their cultural competence.	7	3

Living in Diverse Environments

Additionally, 62 of the 272 participants (22%) shared that their time living in areas where many cultures were coexisting impacted their abilities to communicate with and understand cultures other than their own. One participant shared that “living in Pennsylvania for a few years taught me how other people are different from me even though they are still American.” Nine students specifically mentioned that the area they grew up in made a difference in their ability to understand other cultures. One participant shared an account of this, writing, “I’ve grown up in a

large city, so it made it easier to find people different than me.” Another wrote “I have neighbors that come from different cultures than I do, and growing up with them has taught me many things about their culture and livelihood.”

Travel

45 of the 272 participants (17%) indicated that a major factor in their cultural competency was their experience traveling. 27 of those participants specifically noted that international travel has been beneficial to their development. One student noted, “I visited Denmark and Europe as a teen, it helped me understand the breadth of the world and how little I really knew of it.” However, seven participants explicitly specified that domestic travel was key to their development. For instance, one participant stated, “traveling even within the country has given me insight on other cultures.”

Work Experiences

Finally, the only other theme that appeared more than 15% of the time was work experiences. 44 of the 272 participants (16%) indicated that the time spent at their respective jobs enhanced their cross-cultural competency. One participant wrote, “working in retail allowed me to work with and serve people from all over.” Further presence of this theme was noted when a participant commented, “I think that my work has definitely allowed me to strengthen my cross-cultural communication because when you work with many different types of people than you are required to talk and get to know them.” Coming from a different area, another participant shared, “I have a campus job that is very diverse, so I have been exposed to many different cultures.” Another response highlights the range of positions that impacted the competency of these individuals. “Managing shifts at both of my jobs, it really makes you take a step back and absorb other people's lives to help and work together.”

Summary

Our primary goal was to identify the experiences these students had already encountered in order to build upon them and further enhance their intercultural competence. The analysis revealed that the top three influential experiences were friends & interpersonal relationships (26%), school experiences (24%), and living in diverse environments (22%). These experiences, along with the others identified, shared a common theme: interacting with people from different cultures significantly enhances intercultural competencies. It is important to note that this insight has been developed from the perspective of undergraduate students. Students' reflection on where they are currently will aid in the development of better educational practices for them. Moreover, this insight underscores the importance of creating educational environments that encourage diverse interactions. Such environments allow students to engage with and learn from individuals with different perspectives, ultimately preparing them for the global workforce.

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