

*Frontiers: The Interdisciplinary Journal of Study Abroad*

© Sakhi Aggrawal, Aparajita Jaiswal, Vidya Madana

The work is licensed under the [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nd/4.0/).

Volume 38, Issue 1, pp. 1-34

DOI: [10.36366/frontiers.v38i1.1099](https://doi.org/10.36366/frontiers.v38i1.1099)

[www.frontiersjournal.org](http://www.frontiersjournal.org)



# Cultural adjustment patterns in short-term study abroad: A case study analysis of incoming first-year students' intercultural development

Sakhi Aggrawal<sup>1,2</sup>, Aparajita Jaiswal<sup>1</sup>, Vidya Madana<sup>1</sup>

## Abstract

Intercultural competence is essential for STEM undergraduates in a globalized workforce. This case study examines the intercultural development of incoming first-year students during a short-term study abroad program in Germany and Spain. The research integrates quantitative data from the Intercultural Development Inventory® (IDI) and qualitative analysis of students' 52-page reflection handbooks, analyzed using Berry's acculturation framework to trace individual trajectories. The study addresses a critical gap by examining the highly individualized, varied paths of cultural adjustment in a traditionally understudied STEM incoming first-year cohort. Four categories of adjustment were identified: Resisters (Separation to Marginalization), Seekers (Marginalization to Assimilation), Adapters (Separation to Assimilation), and Embracers (Separation to Integration). These categories reveal diverse intercultural development trajectories, shaped by individual strategies, personal characteristics, and cultural challenges. While Embracers showed the most significant progress toward integration, other groups experienced varying levels of growth, highlighting the complexities of cultural adjustment. Notably, female students demonstrated a greater propensity toward Integration compared to male students, who mostly achieved Assimilation. The findings highlight the importance of structured pre-departure preparation, reflective practices, and tailored interventions. This study

---

1 PURDUE UNIVERSITY, WEST LAFAYETTE, USA

2 INSTITUTE FOR EDUCATIONAL INNOVATION & TECHNOLOGY, JERSEY CITY, USA

**Corresponding Author:** Aparajita Jaiswal, [jaiswal2@purdue.edu](mailto:jaiswal2@purdue.edu)

Date of Acceptance: February 17<sup>th</sup>, 2026

affirms the potential of short-term programs to foster intercultural competence in STEM undergraduates.

## **Keywords**

Berry's acculturation model; higher education; intercultural competence; incoming first-year; study abroad

---

## **1. Background**

With the current state of rapid globalization in the workplace and higher education, intercultural competence in individuals, especially students, is becoming an increasingly necessary skill to cultivate (Bahrami et al., 2023; Puckett & Lind, 2020). Intercultural competence (ICC), also referred to as cultural competence, can be defined as an individual's ability to change their cultural approach and attitudes to adapt to different cultures (Deardorff, 2006). Many components of intercultural competency allow individuals to grow their ICC levels, including cultural awareness, intercultural sensitivity, adaptation, flexibility, empathy, and more (Sarwari et al., 2024).

For college undergraduate students, intercultural competency is especially important to help them navigate the modern, interconnected world (Magana et al., 2023). Higher ICC levels can help students better navigate conversations and settings with intercultural audiences/peers and also in future workplace settings, where intercultural competence is a highly sought-after skill (Guillén-Yparrea & Ramírez-Montoya, 2023; Hensista et al., 2023). In the era of globalization, it is critical for individuals to adjust preconceived attitudes and biases to succeed in a globalized world (Adams et al., 2025; Pinto, 2018).

In today's higher education, institutions have begun to emphasize the importance of study-abroad programs (Demetry & Vaz, 2017). Studies show that students who partake in study abroad programs, even short-term programs, yield increased growth of intercultural competence levels, especially amongst students who come from monocultural backgrounds with limited cultural exposure (Grant, 2019; Witkowsky & Mendez, 2018). Students who participate in study abroad remarked that they have become more outgoing and grown their social circle (Prieto-Arranz et al., 2023). Students also reported having an increased sense of empathy and openness to embracing diversity after their study abroad experiences (Jaiswal & Sapkota, 2024; Jin et al., 2024).

These study abroad programs also yield enhanced personal growth amongst students, especially pre-freshmen students in higher education (Inoue et al., 2023). Many pre-freshmen who participate in study abroad programs have increased global competency levels, with IDI scores significantly changing from before and after the program (Bittinger et al., 2022). The study reports the development of students' curiosity, increased knowledge of cultural worldview frameworks, improved communication skills, increased cultural self-awareness, and growth in confidence and action-taking, all skills that are particularly critical to develop amongst pre-freshmen students (Bittinger et al., 2022).

Among students in STEM disciplines, study abroad programs can help facilitate individual identity (Kimura & Hayashi, 2019) and intercultural competence (Aggrawal et al., 2024; Demetry & Vaz, 2017). Many STEM students who participate in study abroad programs notice development of unique skill sets and an increased interest in a different culture, thus enhancing their global competencies (Nelson et al., 2025; Verbyla et al., 2024). Many also report an interest in new career paths they did not otherwise consider as a result of the study abroad programs (Witkowsky & Mendez, 2018).

However, study abroad programs alone have limited effectiveness. Rather, supplemental learning activities and curricula can help elevate students' learning and increase their intercultural competence (Lou & Bosley, 2023). Research shows that students who not only attend the program but also engage in pre- and post-program learning activities show a significant increase in IDI scores after returning to their home country (Lou & Bosley, 2023). These activities serve as a means of departure orientation and re-entry orientation for students, allowing them to reflect on their experiences before and after. Further, studies show that groups of students who receive formulaic input and guided instruction during their study abroad experience are much more likely to be able to effectively communicate and pick up on language-learning in the host country (Wang & Halenko, 2022). The study also shows that the impact of cultural shock, which can often cause students to regress in intercultural competence levels, can be lessened due to the pre-training provided.

Thus, to maximize student benefits with study abroad trips, it is critical to pair the program with a concurrent learning intervention program, such as reflection activities, cultural awareness modules, etc. (Wang & Halenko, 2022). When these are paired in conjunction, students can obtain effective personal growth and develop critical skills, such as increased intercultural competence,

which will aid them in future endeavors potentially for as long as 50 years (Dwyer, 2004).

While prior research affirms the general trend of ICC growth during study abroad, it often presents development as a unified, linear outcome. This study addresses a critical gap in literature by focusing on the STEM incoming first-year student population, a group that is under-researched despite the global imperative for technical competence. The research provides an in-depth case study analysis of individual student trajectories, thus enabling us to move beyond aggregate scores to understand the complex, varied, and non-linear paths of cultural adjustment within this unique cohort. This research uses a multi-theoretical model to map individual change, resulting in four distinct adjustment patterns. The findings offer valuable insights into how individual characteristics intersect with program design to shape intercultural outcomes as well as provide practical implications for designing targeted interventions.

## **2. Theoretical framework**

The study is grounded in three complementary models: Berry's acculturation model, Kolb's experiential learning theory, and the Intercultural Development Continuum (IDC), which collectively provide a comprehensive lens through which to examine the complex process of intercultural competence development during study abroad experiences. The integration of these frameworks allows for a robust analysis of student progression, combining quantifiable developmental stages with behavioral strategies and the underlying learning process.

### **2.1. Berry's acculturation model**

Berry's acculturation model offers a valuable framework for understanding how individuals navigate cultural transitions. According to Berry (1997), acculturation is the process of cultural and psychological change that results from the meeting of cultures. The model proposes four acculturation strategies: (i) Integration where individuals maintain their original culture while also participating in the larger society; (ii) Assimilation where individuals adopt the receiving culture and do not maintain their heritage culture; (iii) Separation where individuals reject the receiving culture and retain their heritage culture; and (iv) Marginalization where individuals reject both their heritage culture and the receiving culture.

**FIGURE (1)**  
BERRY'S ACCULTURATION MODEL

		Value and Retain Native Culture	
		Yes	No
Value and Adapt to Host Culture	Yes	Integration	Assimilation
	No	Separation	Marginalization

These strategies are determined by two key factors (as shown in Figure 1): the degree to which individuals wish to maintain their heritage culture and identity, and the degree to which they wish to engage with the larger society (Berry, 2005). In the context of study abroad programs, where the focus is heavily on engagement with the host culture, Berry's model provides a framework for understanding how students negotiate their cultural identity and engage with the host culture.

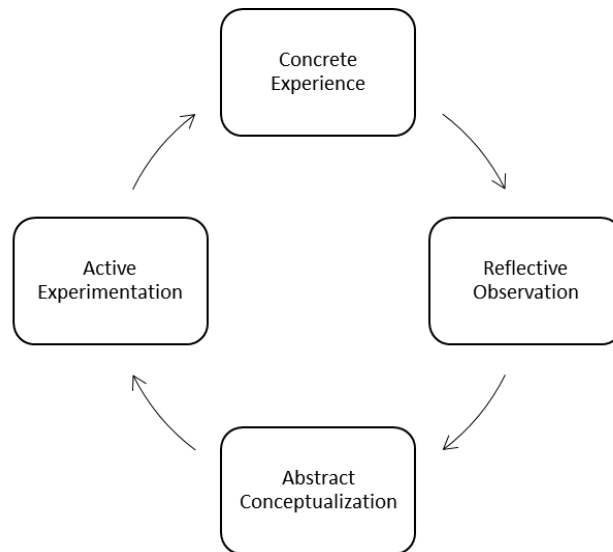
## 2.2. Kolb's experiential learning theory

Kolb's experiential learning theory offers insights into how individuals learn from direct experience, which is particularly relevant in the context of study abroad programs. Kolb (Kolb, 1984) proposed that learning is a cyclical process involving four stages: 1) Concrete Experience where the learner actively experiences an activity; 2) Reflective Observation where the learner consciously reflects on that experience; 3) Abstract Conceptualization where the learner attempts to conceptualize a theory or model of what is observed; and 4) Active Experimentation where the learner plans how to test a model or theory, or plan for a forthcoming experience.

Kolb's theory suggests that effective learning occurs when a person progresses through all four stages of the cycle. In the context of intercultural learning, this cycle can be applied to understand how students process and

internalize their experiences in a new cultural environment (Passarelli & Kolb, 2023). In this study, Kolb's model serves as the theoretical framework for the program to ensure that the reflection handbook guides students through the necessary cognitive stages of Reflective Observation and Abstract Conceptualization and prepares them for Active Experimentation and Concrete Experiences. For instance, in this study, students had an experience of navigating public transportation in a foreign country (Concrete Experience), reflected on the differences from their home country (Reflective Observation), formed generalizations about the cultural values underlying these differences (Abstract Conceptualization), and finally applied this new understanding to future interactions in the host culture (Active Experimentation).

**FIGURE (2)**  
KOLB'S EXPERIENTIAL LEARNING CYCLE



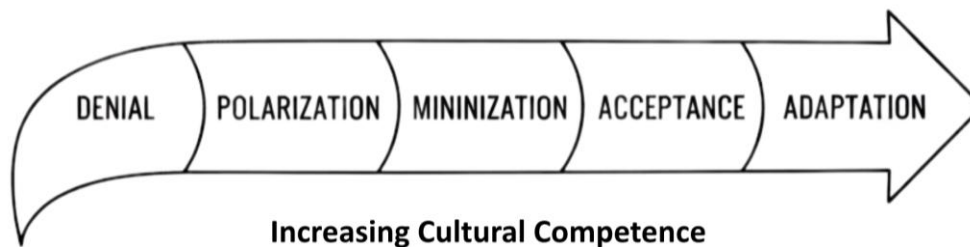
### 2.3. The intercultural development continuum (IDC)

IDC is the theoretical model that provides the developmental framework underlying the Intercultural Development Inventory (IDI), the primary quantitative assessment tool used in this study (Hammer, 2011). The IDC details the cognitive and affective complexity through which individuals experience and engage with cultural difference, moving progressively from ethnocentric (monocultural) to ethnorelative (intercultural) mindsets. The Continuum is comprised of five main orientations (Jaiswal et al., 2025b): 1) Denial (scores below 70): An inability to construe cultural difference, often leading to avoidance or superficial dismissal of difference. 2) Polarization (scores 70–84):

A judgmental view of difference, categorized as either Defense (seeing one's own culture as superior) or Reversal (seeing another culture as superior) 3) Minimization (scores 85–114): Highlighting cultural commonality, often based on universal human similarity, thereby obscuring the complexity of deep cultural differences. 4) Acceptance (scores 115–129): Recognizing and deeply appreciating cultural patterns in one's own and other cultures. 5) Adaptation (scores 130 or higher): Developing the ability to shift cultural perspective and modify behavior in culturally appropriate ways.

**FIGURE (3)**

FIVE STAGES OF INTERCULTURAL DEVELOPMENT CONTINUUM



The IDI provides a numerical score corresponding to one of these orientations, serving as a robust measure of intercultural competence development. The IDC, therefore, tracks the cognitive capacity to handle cultural difference, which is a key component of a student's acculturation process.

## 2.4. Integration of theories

The integration of Berry's acculturation model, Kolb's experiential learning theory, and the Intercultural Development Continuum (IDC) provides a comprehensive framework for understanding the developmental process. IDC provides the quantifiable developmental stage (cognitive capacity) of the student. Berry's Model offers insights into the outcome strategies (behavioral choice) students employ when confronted with a new culture, for example-Integration or Assimilation. Kolb's Theory illuminates the learning process (reflection and experimentation) through which these cognitive capacities and behavioral strategies are developed and refined.

This integrated approach allows for a nuanced examination of how students' acculturation strategies (Berry) may evolve through cycles of experiential learning (Kolb), correlating with shifts along the IDC (IDI scores). For example, a student initially adopting a Separation strategy (Berry),

correlated with a Polarization mindset (IDC), might, through reflective observation (Kolb), begin to conceptualize new ways of engaging with the host culture, leading to experimentation with Integration or Assimilation strategies (Berry) and a subsequent shift toward Minimization or Acceptance (IDC). Furthermore, this multi-model framework aligns with the structure of the study abroad program, which intentionally incorporates immersive experience, guided reflection, and assessment. By examining students' experiences through this tripartite lens, we gain valuable insights into the interplay between developmental stage, cultural engagement strategies, and learning processes in the development of intercultural competence.

### **3. Methods**

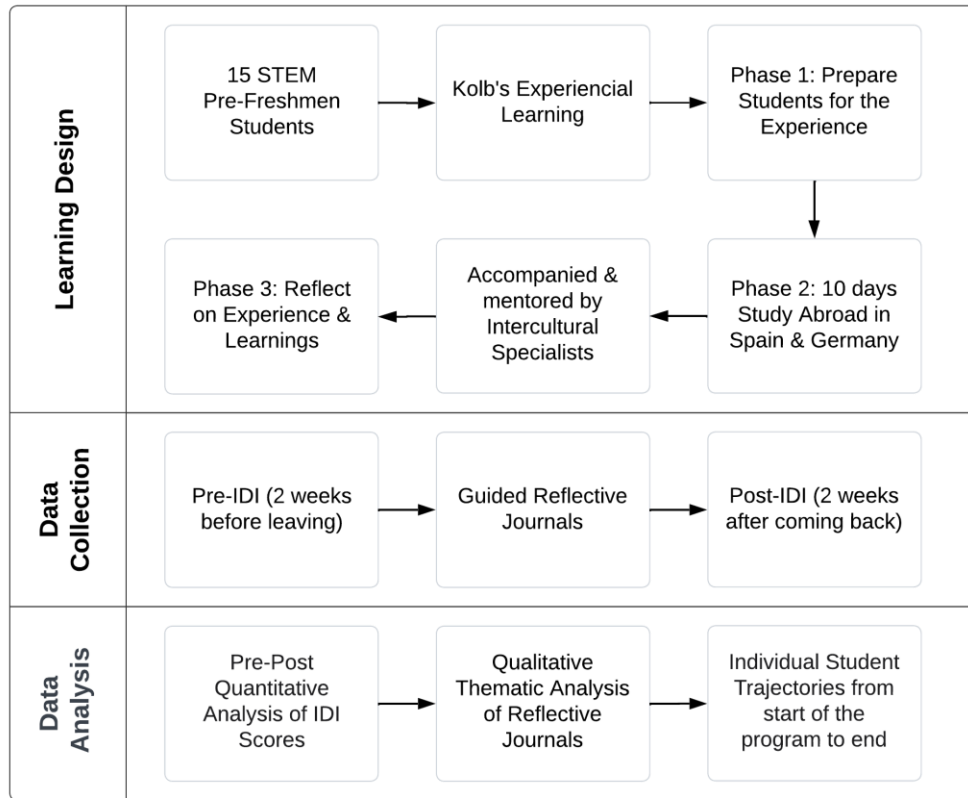
#### **3.1. Context and learning design**

This 3-credit incoming first-year course was designed to enhance students' intercultural competence through a combination of online learning and experiential activities conducted in Germany and Spain (see Figure 4 on the following page for the summary of the program and research methodology). The program had a total duration of 10 days, with approximately 5 days spent in each country. The course integrated the AFS Global Competence Certificate (GCC) curriculum, a structured framework aimed at developing critical intercultural skills. To assess growth in these competencies, students were required to complete the Intercultural Development Inventory® (IDI) as both a pre-and post-survey. By introducing intercultural skills early in their academic careers, this course aimed to provide students with a foundation for the ongoing development of these abilities throughout their time at university and in future global endeavors.

The course consisted of both pre-departure and on-site learning activities, which blended online modules with hands-on, real-world applications. The GCC curriculum emphasizes four key areas of development: self-awareness, awareness of others, emotional intelligence, and building bridges to others. Through reflective exercises, students were guided to increase their cultural self-awareness, explore how cultural groups influence behaviors and perceptions and critically analyze power dynamics and privilege. Simultaneously, they were encouraged to understand and empathize with individuals from different cultural backgrounds, cultivating emotional intelligence by managing personal biases and navigating ambiguous intercultural scenarios. The curriculum further focused on developing

meaningful relationships and effective communication strategies in diverse cultural settings.

**FIGURE (4)**  
RESEARCH METHODOLOGY



In addition to the online modules, students participated in a variety of on-site activities in Germany and Spain, including cultural visits, excursions, interactions with university partners, and industry visits. These immersive experiences offered opportunities for students to apply their intercultural learning in real-world contexts, reinforcing the practical importance of intercultural competence in a globalized professional environment. Supplemental coursework delivered through [Blinded University Name] Brightspace platform included reflective assignments, readings, and discussions, all of which aimed to deepen students' engagement with the course content.

Assessment for the course included completion of the GCC modules, active participation in on-site activities, and engagement with reflective assignments and discussions. Although the IDI survey was used as a pre-and post-assessment tool to measure students' growth in intercultural competence, the survey results

did not affect their course grades. Rather, the course focused on promoting personal development and reflective learning, equipping students with the intercultural skills necessary to navigate cultural differences effectively throughout their academic and professional lives. This course meets the [Blinded University/Department Name] global learning requirement and offers a framework for developing lifelong intercultural competence in an increasingly interconnected world.

### 3.2. Participants

The participants in this study were drawn from a cohort of 15 incoming first-year students who enrolled in the three-credit intercultural competence short-term study abroad program conducted in Germany and Spain. For this study, only students who completed the entire Global Competence Certificate (GCC) curriculum were considered. A total of 10 students met this criterion, comprising four females and six males. These students participated fully in the program's online and on-site components, including completing the required GCC modules, engaging in discussions, completing the reflection handbook, and taking both the pre- and post-Intercultural Development Inventory® (IDI) assessments. Their participation provided valuable insights into the effectiveness of the curriculum in fostering intercultural competence during their time abroad.

### 3.3. Data collection

This study adopted a case study approach to explore students' intercultural development, utilizing multiple data sources to provide a comprehensive understanding of their experiences. The case study methodology allowed for an in-depth examination of individual and collective narratives, integrating quantitative measures and qualitative reflections to capture the complexity of participants' learning journeys. By focusing on specific cases, this approach offered rich, contextualized insights into students' intercultural growth, highlighting both measurable outcomes and the personal dimensions of their development.

Quantitative data were collected using the Intercultural Development Inventory® (IDI), a widely recognized tool for assessing intercultural competence. The IDI evaluates an individual's position along a continuum of intercultural development, which includes the stages of Denial, Polarization, Minimization, Acceptance, and Adaptation. Individuals in the Denial stage (scores below 70) often overlook or ignore cultural differences due to limited

exposure or simplistic views of diversity. The Polarization stage (scores 70–84) reflects a tendency to either see one’s own culture as superior (Defense) or excessively admire another culture (Reversal), leading to a divided understanding of cultural dynamics. In the Minimization stage (scores 85–114), individuals acknowledge cultural differences but tend to downplay their importance, often assuming that people are more alike than different. Progressing to the Acceptance stage (scores 115–129), individuals develop a deeper understanding of and appreciation for cultural differences, recognizing the value of diverse perspectives and their impact on behavior, communication, and values. Finally, the Adaptation stage (scores of 130 or higher) represents the ability to adjust behavior and thinking effectively in different cultural contexts, fostering successful intercultural relationships. The IDI was administered both before and after the study abroad program to evaluate students’ progress along these developmental stages, offering measurable insights into the evolution of their intercultural competence. The pre-IDI assessment was administered two weeks before student departure while post-IDI was taken two weeks after the students’ return.

Qualitative data were collected through a 52-page GCC reflection handbook that students completed as part of the program. This handbook allowed students to reflect on their experiences during three phases of the program: pre-study abroad, during study abroad, and post-study abroad. The handbook was divided into 18 chapters, each exploring different dimensions of intercultural learning. During the pre-study abroad phase, chapters such as *Metaphors of Culture*, *“Me” as a Cultural Being*, *When Cultures Collide*, and *How to Cope with Challenges* were included to prepare students for the cultural transitions they would encounter. These chapters are particularly useful in helping students reflect on their cultural identity and anticipate potential challenges they might face when immersed in a new environment.

While studying abroad, students engaged with chapters like *“Them” as Cultural Beings*, *Navigating Culture*, *More Cultural Values*, and *Power and privilege*. These chapters allowed students to reflect on their real-time experiences, encouraging them to observe and analyze the cultural behaviors, values, and power dynamics they encountered. Such reflections were critical for helping students develop a deeper understanding of the cultures they were interacting with and how these cultures differed from their own. In the post-study abroad phase, chapters such as *Making Sense of the Experience* helped students process and internalize their intercultural learning after returning

home. This phase is essential for reinforcing the lessons learned abroad and integrating these insights into their future personal and professional lives. By reflecting on their experiences, students can critically assess how their intercultural competence has developed and how they can continue to apply these skills moving forward.

Combination of the quantitative IDI data and the rich qualitative reflections from the handbook allowed for a comprehensive assessment of the students' intercultural development, offering valuable insights into the effectiveness of the curriculum in fostering intercultural competence over time.

### 3.4. Data analysis

This case study design employed both quantitative and qualitative methods to understand students' intercultural development during a short-term study abroad program. Quantitative data, collected through the Intercultural Development Inventory® (IDI), were analyzed using descriptive statistics to evaluate changes in students' intercultural competence by comparing their pre- and post-program scores. Qualitative data were analyzed using Berry's acculturation framework see Figure 1. The researchers analyzed each student's 52-page reflection handbook, which included pre-, during-, and post-study abroad chapters, to map individual trajectories across Berry's acculturation stages over the course of the program. By synthesizing these qualitative reflections with their corresponding IDI scores, patterns of intercultural adjustment were identified and categorized based on similar trajectories. For instance, students who transitioned from Separation to Integration were grouped and analyzed collectively to identify the contextual factors and support mechanisms that facilitated their growth. Similarly, transitions between other stages, such as from Marginalization to Assimilation, were examined through integrated narratives that combined insights from both the qualitative reflections and quantitative data, providing a comprehensive view of their intercultural development. This case study approach provided context-rich understanding of students' intercultural adaptation, highlighting the interplay between individual experiences and broader developmental patterns. By applying Berry's acculturation model, the study traced students' cultural adjustment journeys and offered a structured framework to assess how cultural identity and social interaction intersect during cross-cultural transitions.

### 3.5. Trustworthiness

To ensure the trustworthiness of the qualitative data, the study adhered to the four key criteria outlined by Lincoln and Guba, (1986): *credibility*, *transferability*, *dependability*, and *confirmability*. *Credibility* was enhanced through triangulation of data sources, combining quantitative data from the IDI and qualitative reflections to cross-check findings and provide a comprehensive understanding of students' intercultural development. In terms of *transferability*, the study provided thick descriptions of the context and student experiences, allowing readers to evaluate whether the findings may be applicable to other contexts, such as similar intercultural programs or educational settings. *Dependability* was ensured by maintaining a clear audit trail throughout the data collection and analysis processes. Detailed records of decisions made during data analysis, particularly the categorization of student reflections using Berry's acculturation model, ensured transparency and replicability. Finally, *confirmability* was achieved by minimizing researcher bias through reflexivity, where researchers actively reflected on their own cultural assumptions during the analysis process. Peer debriefing was employed to review and challenge interpretations of the qualitative data, ensuring that conclusions were grounded in the participants' experiences rather than researcher assumptions.

Regarding researcher positionality, the research team was not directly involved in the design or administration of the short-term study abroad program, allowing for a position of external objectivity in analyzing the data. The primary analysis focused on emergent trajectories rather than the program's intended outcomes, and data coding was conducted independently before peer debriefing. These measures ensured conclusions were grounded solely in the students' lived experiences and reflective data.

## 4. Results

### 4.1. Category 1: The resisters

This category includes students who moved from Separation to Marginalization, showing increased disconnection and resistance to cultural integration. It included one male student with their journey given in Table (1).

This student's journey through their study abroad experience reveals a shift from Separation to Marginalization, as reflected in both their behavior and a notable regression in their IDI score, a shift from Polarization (with an initial

score of 78.9) to Denial (with a post-program score of 65.1). At the outset, the student demonstrated a clear sense of Separation, maintaining a high acceptance of their own culture while displaying a reserved openness to change. For example, before departure, the student expressed concerns about adapting to Spain, saying, “I do expect there to be some misunderstandings because I will not be used to the collectivist culture there.” This sentiment reflects an acknowledgment of cultural differences yet also hints at an underlying hesitation to engage deeply with the host culture.

**TABLE (1)**  
CULTURAL ADJUSTMENT JOURNEY OF “THE RESISTERS”

Pseudonym	Self-Identified Gender	Pre-IDI Score	Pre-Acculturation Strategy	During-Acculturation Strategy	Post-Acculturation Strategy	Post-IDI Score
S1	Male	78.90	Separation	Marginalization	Marginalization	65.10

During the experience, the student’s discomfort with cultural differences became more pronounced, indicating a shift towards Marginalization. In Germany, a simple interaction at a food stand turned into a frustrating experience: “The lady that took my order kept just saying ‘roll’ over and over again and then speaking German to clarify...I ended up just pointing to the roll and saying no over and over again.” In a later reflection on this incident, the student wrote, “I don’t know why she couldn’t understand me, and I felt stupid. It was so frustrating, and I just wanted to leave. I ended up not even getting food.” This incident shows a growing sense of alienation and frustration, where the student felt overwhelmed by the language barrier and cultural differences. Despite the student’s awareness of the frustration on both sides, they were unable to bridge the gap, opting to withdraw from the interaction rather than adapt which shows a lack of personal change.

As the experience progressed, the student’s struggle with cultural adaptation deepened. They noted, “Each time we arrived at a new location, I started negatively judging it for absolutely no reason.” This quote captures the student’s increasing tendency to react negatively to unfamiliar environments, a hallmark of the Marginalization stage. In Spain, this became particularly evident when the student mentioned, “The first meal I had there was extremely disappointing, and that got me off on the wrong foot for the start of Valencia.” The initial negative experience colored their perception of the entire city, reflecting a deepening sense of disconnection. The student’s tendency to focus on these negative first impressions, without giving the new environment a fair

chance, further cemented their movement towards Marginalization, where they felt distanced from both the host culture and their own.

By the end of the study abroad experience, the student reflected on their behavior with a sense of regret, acknowledging, “I learned that I am very judgmental about new things. Most of the time I don’t even realize it until something disproves my original judgment.” This newfound self-awareness, however, comes after a series of negative experiences that shaped their journey. The student recognized that their initial judgments often led to an unwarranted sense of discomfort and frustration, which persisted throughout their time abroad. Despite moments of realization, such as when they mentioned needing to “think less about any judgments of people and culture,” the overall trajectory of their experience was marked by a retreat from cultural engagement. This journey, which began with a cautious Separation from the host culture, gradually evolved into a deeper Marginalization, where the student felt increasingly disconnected and resistant to both their own cultural norms and those of the places they visited. The meaningful regression in their IDI score reflects this downward spiral, which was substantiated by their qualitative reflections of ‘shutting down’ and retreating from host cultural engagement, ultimately leaving them with a diminished acceptance of both the host culture and their own.

#### 4.2. Category 2: The seekers

This category includes students who moved from Marginalization to Assimilation, seeking a balance in accepting cultural differences while maintaining their identity. It included two male students with their journey given in Table (2).

**TABLE (2)**  
CULTURAL ADJUSTMENT JOURNEY OF “THE SEEKERS”

Pseudonym	Self-Identified Gender	Pre-IDI Score	Pre-Acculturation Strategy	During-Acculturation Strategy	Post-Acculturation Strategy	Post-IDI Score
S2	Male	68.12	Marginalization	Separation	Assimilation	88.56
S3	Male	68.17	Marginalization	Assimilation	Assimilation	81.22

At the start of their study abroad experience, both S2 and S3 exhibited Marginalization, reflecting low acceptance of both their heritage and host cultures, with initial IDI scores of 68.12 and 68.17, respectively, placing them in the Denial stage. S2 transitioned from Marginalization to Separation during the

program and ultimately to Assimilation, reflected in a post-IDI score of 88.56, showing growth toward Minimization and cultural integration. S3 moved directly to Assimilation, with a post-IDI score of 81.22, placing them in Polarization (Reversal), demonstrating functional adjustment but a tendency to overvalue the host culture while downplaying their heritage culture.

For S2, the journey began with a passive approach to cultural learning. He entered the experience with an open mindset, stating, “I didn’t necessarily know what to expect, so I wanted to just see what happens and generate my thoughts while in the new environments.” However, his openness lacked the initiative necessary for meaningful personal growth. S2’s early reflections reveal a sense of confusion and discomfort in navigating the new cultural landscape, where the practice of haggling in open-air markets left him feeling unsettled. He described this as “sort of confusing,” highlighting his initial difficulty in adapting to the norms that differed so greatly from those in the United States.

Similarly, S3 began his journey with a tendency to withdraw in unfamiliar environments. He admitted, “If I am in an uncomfortable environment where I’m not used to the people I’m around, I would learn best by working hands-on on my own.” This inclination to isolate himself reflected a Marginalization mindset, where engagement with the new culture was minimal. S3’s pre-departure reflections also revealed a limited understanding of cultural differences, as seen in his reaction to a friend’s experiences with parental expectations in a different cultural context, for example,

“A cultural irritation I have experienced was when my friend told me about how her parents want her to become a doctor even though she doesn’t want to. From what I have been told, it is typical for parents in her culture to somewhat control their kids’ live”.

He seemed puzzled and somewhat judgmental, indicating a narrow perspective that further distanced him from meaningful cultural engagement.

As their experiences abroad progressed, both S2 and S3 began to show signs of moving toward Assimilation, though their paths were distinct. S2, for example, found himself needing to cope with the overwhelming nature of crowded public transportation in Germany. He relied on music as a way to “tune everything out,” a strategy that indicated a lingering sense of separation but also a step toward adaptation. Over time, S2 started to adjust to the cultural differences, such as the unique bathroom norms and the importance of bike

lanes in Germany. Showcasing a growing willingness to adapt rather than resist, he said,

Another incident was with the bike lanes. I misunderstood where they were and how important they are. In the US, the bike lanes are usually on the road by the cars, with pedestrian walkways on their own. This is very very different to Germany's bike lanes. These bike lanes are right next to the pedestrian walkways, off of the road. They are very important.

In contrast, S3's journey toward Assimilation was marked by moments of discomfort followed by gradual acceptance of host country's norms. An early incident in Germany, where he and his peers sat at a table with strangers, initially made him uncomfortable. However, he soon adjusted, saying, "I began to understand how people in Germany are accepting when it comes to sharing common places." This experience marked a pivotal moment for S3, as he started to overcome his initial reservations and engage more openly with the host culture. His strategy of finding common ground, such as communicating in English, helped him navigate cultural barriers, though it also reflected a reliance on familiar cues.

By the end of their study abroad experience, both S2 and S3 had made significant strides toward Assimilation, as reflected in their post-IDI scores - 88.56 for S2, indicating a move toward Minimization, and 81.22 for S3, showing a shift toward Polarization Reversal. S2 reflected on his journey by stating, "As I gathered more and more information about the environments, I got more and more comfortable in each." This quote encapsulates his growing ability to adapt to and find comfort in previously foreign settings. Similarly, S3 expressed a newfound openness, noting, "The experience caused me to have an even greater open mind towards new cultural environments."

While both students started from a place of Marginalization, their journeys highlight different paths to Assimilation. S2's progression was marked by a gradual adaptation to cultural norms, while S3's journey was characterized by overcoming initial discomfort and finding ways to connect with the host culture. Together, their experiences illustrate the varied and personal nature of cultural adjustments, as they both moved from a state of low acceptance and low personal change to a place where they were more willing and able to engage with the world around them.

### 4.3. Category 3: The adapters

This category includes students who moved from Separation to Assimilation, showing gradual adjustment without fully integrating. It included three male students with their journey given in Table (3).

**TABLE (3)**  
CULTURAL ADJUSTMENT JOURNEY OF “THE ADAPTERS”

Pseudonym	Self-Identified Gender	Pre-IDI Score	Pre-Acculturation Strategy	During-Acculturation Strategy	Post-Acculturation Strategy	Post-IDI Score
S4	Male	71.38	Separation	Assimilation	Assimilation	81.17
S5	Male	99.95	Separation	Assimilation	Assimilation	94.21
S6	Male	79.08	Separation	Assimilation	Assimilation	84.67

At the beginning of their study abroad experience, S4, S5, and S6 exhibited characteristics of Separation, marked by a high acceptance of their own culture but a low willingness to engage in personal change. Their initial IDI scores - 71.38 (Polarization) for S4, 99.95 (Minimization) for S5, and 79.08 (Polarization) for S6 - reflected varying levels of cultural understanding, yet all three students initially approached their new environments with preconceived notions and a sense of cultural divide.

For S4, the journey began with a strong sense of cultural separation, as evidenced by his discomfort with certain cultural norms in Germany. He remarked on feeling a cultural irritation when navigating the public transportation system in Germany, particularly with the silence expected on trams and trains. He said, “In my culture, it is common to be loud. In fact, that usually signifies that people are having a good time! The locals on the trams, however, gave us annoyed looks.” This quote highlights his initial difficulty reconciling his cultural values, where being loud in public is seen as a sign of enjoyment, with those of the host country, where quietness in public spaces is the norm. Despite his awareness of these differences, S4 struggled with fully accepting them, often viewing the host culture as inferior. He expressed frustration over what he perceived as inefficiencies, such as the lack of free water and the larger bike lanes compared to sidewalks in Germany.

S5 also began with a sense of Separation, though he approached his new environment with a mix of excitement and stereotypes. Before his departure, he expected Germans to be “more uptight but friendly,” reflecting a superficial

understanding of the culture. His early experiences in Germany reinforced his initial discomfort, particularly when faced with language barriers. S5 recalled an incident where he struggled to assist an older couple at a train station, feeling “terror” and “embarrassment” due to his limited German, he said,

“When I was on a train station in Germany. I was approached by an older couple who did not understand English. The first feeling I experienced was terror as I have not studied German for a long time, and I understood only a little of the language.”

However, despite these challenges, he showed a willingness to engage, he further added the following, which set the stage for his gradual movement toward Assimilation.

“I did my best to help them, trying my best to speak the language but I eventually had to look at a map and explain to them which train they had to take, after I found out myself. They understood and they waved me goodbye with a smile on their faces”

Similarly, S6 entered the experience with a strong attachment to his cultural norms, as demonstrated by his reaction to hygiene practices in other countries. He expressed a sense of cultural irritation, stating, “One cultural irritation that I have experienced is the amount of hygiene or different ways to relieve yourself in other countries compared to the United States.” This sense of discomfort highlighted his initial resistance to change and adaptation.

As the experience progressed, all three students began to shift toward Assimilation, each in their own unique way. S4 started to adapt to the new cultural environment, although he still faced frustrations. He mentioned, “It was when I started to get comfortable with the way of life in the city I was in that my mindset began to change.” This shift marked the beginning of his willingness to adjust his behavior, such as planning for restroom needs and managing his belongings in crowded areas. His gradual adaptation reflected a growing acceptance of the host culture, even if it was initially seen through a lens of frustration.

S5’s journey was characterized by overcoming initial fears and learning to navigate cultural differences. He described how his mindset changed over time, saying, “At the start I was stressing out over every little interaction...but eventually the more I spent abroad the more I realized that people are willing to help someone even if they do not understand the language.” This growing

confidence allowed him to engage more openly with the host culture, moving from a state of cautious separation to active participation and assimilation.

S6 also showed significant growth throughout the experience. Initially resistant to cultural differences, he later reflected on his ability to adapt, stating, “I was more receiving towards cultural shocks and irritations.” His openness to personal change became more evident as he consciously tried not to live up to the “American stereotype of being loud and annoying,” indicating a move toward greater cultural sensitivity and adaptation.

By the end of their study abroad experience, all three students had moved from a state of Separation to Assimilation, as also reflected in their post-IDI scores - S4: 81.17 (Polarization) S5: 94.21 (Minimization) and S6: 84.67 (Polarization). While each student’s journey was distinct, they all shared a common trajectory of moving from a place of cultural separation and minimal personal change to a greater openness and willingness to adapt to their new environments. This shift was marked by an increased understanding of and respect for the cultural norms of their host countries, as well as a willingness to adjust their behaviors and attitudes, demonstrating meaningful personal growth and cultural assimilation.

#### 4.4. Category 4: The embracers

This category includes students who moved from Separation to Integration, fully embracing cultural differences and incorporating them into their identity. It included four female students with their journey given in Table (4).

**TABLE (4)**  
CULTURAL ADJUSTMENT JOURNEY OF “THE EMBRACERS”

Pseudonym	Self-Identified Gender	Pre-IDI Score	Pre-Acculturation Strategy	During-Acculturation Strategy	Post-Acculturation Strategy	Post-IDI Score
F1	Female	107.25	Separation	Separation	Integration	136.46
F2	Female	74.39	Separation	Assimilation	Integration	89.47
F3	Female	72.93	Separation	Assimilation	Integration	93.39
F4	Female	97.43	Separation	Assimilation	Integration	104.67

At the outset of their study abroad experience, F1, F2, F3, and F4 began with a mindset characterized by Separation. Each student had a strong attachment to their cultural norms, combined with varying levels of openness

to personal change. Their initial IDI scores, 107.25 (Minimization) for F1, 74.39 (Polarization) for F2, 72.93 (Polarization) for F3, and 97.43 (Minimization) for F4, reflected different starting points in terms of cultural understanding, but all exhibited a common thread of maintaining a distinction between their own culture and the new environments they encountered.

F1's initial experiences highlight a sense of cultural surprise and irritation when faced with different norms. She noted, "We had a foreign exchange student here from France, and one cultural surprise I experienced was the kissing on the cheeks any time we met up with some of his foreign exchange friends." This discomfort with physical expressions of affection, which were unfamiliar to her, illustrates her initial separation. Similarly, her frustration with southern U.S. road behaviors further illustrated her difficulty in adapting to new cultural norms, as she expressed annoyance with people stopping traffic to chat. Despite these challenges, F1 showed early signs of self-reflection and an understanding that these behaviors stemmed from different cultural values which laid the groundwork for her eventual growth.

F2 began her journey with mixed feelings of openness and frustration, particularly when dealing with collectivist norms she encountered through her Japanese grandmother. This initial tension between her individualistic upbringing and her exposure to collectivist values highlighted her struggle to fully integrate these differing cultural norms. She stated, "When I was younger, my grandma would watch me and expect me to be with her all the time. I never got a moment to myself," reflecting a separation mindset. However, as she prepared for her trip to Germany and Spain, F2 expressed an eagerness to learn, although with a limited expectation of her cultural challenges.

Similarly, F3 started her experience with a clear sense of the cultural divide, acknowledging potential misunderstandings due to differences between individualistic and collectivist cultures. She expressed a certain apprehension about adapting to these new cultural settings, highlighting her separation from the host cultures. For example, she mentioned her concern about navigating the high-context communication styles in Germany, indicating an awareness of the cultural differences but also a sense of separation from these norms. She said, "I can see potential misunderstandings based on the differences of individualistic and collectivist cultures within each of the countries. Not being used to a collectivist culture might arise with misunderstandings."

F4, on the other hand, exhibited a broader range of cultural awareness, stemming from her Thai-American background, which had exposed her to both individualistic and collectivist ideals. However, she still struggled with fully embracing cultural differences, particularly when it came to balancing her need for independence with the collectivist norms she encountered in Thailand. She said, “a cultural irritation I experienced in Thailand was having no alone time. Since Thailand is a very collectivist culture and America is more individualist, I felt very exhausted when I had little time to myself.” Her initial experiences in Germany, where she found the fast-paced culture overwhelming, also reflected her struggle to adapt, further indicating a separation mindset.

As their study abroad experiences progressed, each student began to shift towards Integration, characterized by a growing acceptance of cultural differences and an increasing openness to personal change. F1, for instance, despite initial frustrations with the lack of air conditioning in Germany and the need to pay for public restrooms, began to adapt her mindset. She reflected, “I can adapt by not complaining and accepting that paying the fee actually allows for cleaner restrooms as a whole.” This shift in perspective marked a significant step toward integration, as she started to view cultural differences not as irritations but as different ways of life with their own merits.

F2 also showed significant growth during her experience, particularly in her approach to navigating new cultural landscapes. She initially struggled with the different operational hours in Munich, which caused her stress and frustration, but she eventually adapted, learning to navigate her environment more effectively. Her use of a translation app to communicate with a local woman in Germany further demonstrated her growing willingness to integrate, as she actively sought to bridge the cultural and linguistic gap. She said,

“When I first got here [in Germany] a women started talking to me in German and instead of ignoring her I tried to communicate in English. So I decided to use a translating app to actually communicate with her. This did work because I was able to help her out and everything worked out. I was able to get her going in the right direction and I hope that she ended up going to the right place.”

F3’s journey toward integration was marked by a gradual adaptation to new cultural norms. Despite initial frustrations with the lack of public restrooms and tipping practices in Germany, she began to understand and accept these differences. She noted, “I can manage my emotional response to the

situation by understanding that it is normal in German culture to not tip servers,” reflecting her growing ability to adapt to and respect the host culture's norms.

F4's progression toward integration was highlighted by her increasing comfort with new experiences and cultural norms. Initially overwhelmed by the fast-paced culture in Germany, she gradually adapted, stating, “I had to adapt by being more aware of my time and also set time to recoup.” Her experiences in Spain, where she explored new forms of self-expression through activities like learning the flamenco dance, further illustrated her willingness to step outside her comfort zone and integrate into the local culture.

By the end of their study abroad experience, all four students had moved from Separation to an Integration strategy, as reflected in their post-IDI scores - 136.46 (Adaptation) for F1, 89.47 (Minimization) for F2, 93.39 (Minimization) for F3, and 104.67 (Minimization) for F4. Each student's journey was unique, yet they all shared a common trajectory of growing from a place of initial cultural separation to a deeper understanding and acceptance of the cultural norms in their host countries. It is important to note that while only F1's IDI score reached the Adaptation stage, the qualitative data from all four students showed a clear adoption of an Integration strategy as defined by Berry's model: they actively sought to engage with and learn from the host culture while maintaining their own cultural identity. Their post-IDI scores, all of which showed significant positive movement, reflect varying points along this developmental path. Their classification as "Embracers" is based on their shared integrative strategy and positive trajectory evident in their reflections, rather than on achieving a specific final IDI stage. Their experiences showcase the importance of openness, adaptability, and the willingness to embrace cultural differences, ultimately leading them to a more integrated and enriched worldview.

## **5. Discussion**

This study provides valuable insights into the intercultural development trajectories of students participating in a short-term study abroad program. By examining quantitative data from the Intercultural Development Inventory® (IDI) and qualitative reflections through the lens of Berry's acculturation framework, the research highlights the complexities of cultural adjustment and the interplay between individual behaviors, perceptions, and broader developmental patterns. The distinct categories of adjustment: Resisters, Seekers, Adapters, and Embracers, emphasize the variability in intercultural

competence development, shaped by participants' starting strategies, individual characteristics, and the challenges they encountered abroad.

### 5.1. Comparisons across categories

The four categories reveal a spectrum of intercultural adjustment trajectories, ranging from regression to transformation. Resisters, exemplified by S1, represent students who struggled to engage with cultural differences and regressed from Separation to Marginalization. Their experiences were marked by frustration with cultural norms and an inability to reconcile these differences, culminating in reduced cultural openness and a notable drop in their IDI scores. This finding aligns with prior research suggesting that students with limited openness or initial resistance to cultural engagement are at higher risk of experiencing negative intercultural outcomes (Aggrawal & Magana, 2024; Maharaja, 2018). In contrast, Seekers (e.g., S2 and S3) illustrate the potential for growth through Assimilation. These students began with Marginalization, reflecting a lack of connection to both their heritage and host cultures, but progressed by gradually adopting host cultural practices. While S2's significant improvement (from 68.12 to 88.56) suggests a growing openness and movement toward Minimization, S3's journey to Polarization (Reversal) indicates a functional but incomplete adaptation, marked by an overvaluation of the host culture. These trajectories suggest that the structured reflective activities played a key role in their development, not as a guaranteed intervention, but as the primary mechanism for processing their experiences (Jaiswal et al., 2024; Lomicka & Ducate, 2021), aligning with the 'Reflective Observation' stage of Kolb's cycle.

Adapters (S4, S5, and S6) represent students who moved from Separation to Assimilation, demonstrating moderate progress in intercultural competence. While their IDI score increases were not as dramatic as those of the Embracers, their journey reflects a gradual balancing of heritage cultural values with engagement in the host culture. Their experiences showcase the role of practical adjustments, such as navigating public transportation norms or overcoming language barriers, in fostering cultural sensitivity. These findings align with studies emphasizing the importance of experiential learning and hands-on adaptation for moderate intercultural growth (Berg et al., 2009). Finally, Embracers stand out as the most successful group, moving from Separation to Integration and achieving significant IDI score improvements. These students, all female, demonstrated the ability to fully engage with and incorporate host cultural practices into their worldview. For example, F1's shift from 107.25

(Minimization) to 136.46 (Adaptation) highlights the transformative potential of study abroad experiences when participants actively seek out and embrace cultural differences. This aligns with existing literature suggesting that female students often exhibit greater intercultural sensitivity and adaptability, attributed to higher levels of empathy and a predisposition toward relational engagement.

## 5.2. Gender differences

The results of the study highlight significant gender differences in intercultural adjustment trajectories, with female participants demonstrating more substantial progress toward Integration and higher intercultural competence compared to their male counterparts.

The findings suggest that female students (Embracers) moved from Separation to Integration were more likely to actively engage with host cultural norms, leading to deeper cultural integration. This aligns with research by Terzuolo (2018) which highlights that women often display higher levels of intercultural sensitivity and adaptability. These traits are attributed to greater empathy, emotional intelligence, and relational engagement, which enable female students to navigate cultural differences more effectively. For example, F2 and F4's ability to adapt to challenges, such as language barriers and cultural norms around collectivism, underscores their openness to new experiences. Additionally, F1's willingness to embrace discomfort (e.g., paying for restrooms and adapting to a lack of air conditioning) demonstrates a critical step toward Integration, where cultural differences are not merely tolerated but understood and appreciated as part of a broader worldview. Male participants showed less consistent progress, with most falling into the Seekers and Adapters categories, characterized by Assimilation rather than Integration. While S2 demonstrated significant improvement in his IDI score (from 68.12 to 88.56), moving toward Minimization, his reflections revealed a more surface-level adaptation. S3, despite transitioning to Polarization (Reversal) with an IDI score of 81.22, focused primarily on functional adjustments, such as learning to navigate shared spaces, rather than exploring deeper cultural meanings.

The findings align with recent research by Cordua and Netz (2022), which suggests that women are more likely to intend to study abroad due to their early-life development of competencies, such as language skills and subject choices, that facilitate international mobility. Additionally, women are more likely to select fields of study where study abroad is considered valuable for competence

acquisition, further fostering their intercultural engagement and adaptability. The results are also consistent with findings by Tompkins et al., (2017), who identified statistically significant differences in intercultural competence between men and women. Women scored higher in areas such as interaction engagement, respect for cultural differences, and interaction attentiveness, reflecting a greater openness to and appreciation for cultural diversity. These traits were evident in the female participants in this study, who actively engaged with host cultural norms and incorporated them into their worldviews, achieving higher levels of cultural integration. In contrast, male participants demonstrated more functional adaptation, primarily falling into the Seekers and Adapters categories, characterized by Assimilation rather than Integration. This aligns with Tompkins et al., (2017), who found that men are less likely to pursue study abroad for intercultural experiences and more likely to cite career or extracurricular obligations as barriers to participation. The findings suggest that men may benefit from additional program structures that emphasize relational engagement and reflective practices to encourage deeper cultural learning. By addressing these gender-specific differences in motivations and outcomes, study abroad programs can better support both male and female students in achieving meaningful intercultural development, ensuring more equitable and impactful learning experiences (Jaiswal et al., 2025a).

## **6. Implications**

### **6.1. Theoretical implications**

The identification of four distinct trajectories, Resisters, Seekers, Adapters, and Embracers, offers a significant theoretical contribution by demonstrating the non-linear complexity of cultural adjustment within a short-term, structured study abroad setting.

The results challenge a purely sequential view of Berry's Acculturation Model by showing that the process is highly volatile, especially for short-term participants (Niehaus & Nyunt, 2023). Specifically, the existence of the Resisters trajectory (Separation to Marginalization) highlights a risk of developmental regression that must be accounted for in both the Berry and IDC frameworks. For Resisters, exposure without engagement leads to rejection of both cultures, a form of cognitive retreat not always fully captured by linear developmental models (Choy et al., 2021; Krsmanovic, 2020).

Additionally, study provides empirical qualitative context for movement between the IDI's developmental stages. For the Embracers, the move from Polarization/Minimization (IDC) to Integration (Berry) was marked by deep cognitive reframing of cultural differences (Acceptance/Adaptation on IDI). However, the fact that several Embracers adopted an Integration strategy (seen in reflections) while still scoring in the Minimization stage (on the post-IDI) is a key finding. This suggests that in short-term programs, a student's cognitive process and strategy (per Berry) may shift more quickly than their fully developed developmental stage (per IDI). This aligns with findings where students' qualitative reflections show positive change not captured by quantitative scores (Bloom & Miranda, 2015) and can even allow students to 'write beyond' their assessed developmental stage (Spenader et al., 2022). Assimilation may thus be a functional short-term outcome for students moving out of ethnocentrism (Polarization/Minimization on IDI), while the strategy of Integration is the precursor to the longer-term development required to reach the Adaptation stage (Vande Berg et al., 2009).

Furthermore, the findings support the use of Kolb's cycle (as the theoretical mechanism for change within this framework (Passarelli & Kolb, 2023). Students who progressed (Seekers, Adapters, Embracers) demonstrated explicit cycles of Concrete Experience, Reflective Observation (via the handbook), and Active Experimentation (applying new skills). Students who regressed (Resisters) effectively stopped the cycle at the Concrete Experience stage, failing to engage in the structured reflection that could have driven Abstract Conceptualization and positive change. This supports the concept that without intentional reflection, experience alone is insufficient and can lead to 'experiential laissez-faire' (Tomkins & Ulus, 2016). This suggests that the use of reflection, not just its availability, is what facilitates movement along the IDC and enables more adaptive acculturation strategies and a failure to reflect intentionally can be a key risk factor for negative outcomes (DeCrescenzo & Jangha, 2023).

## 6.2. Practical implications

The findings from this study also have significant practical implications for the design and implementation of study abroad programs. First, the results highlight the diagnostic value of comprehensive pre-departure preparation. While this study cannot prove the causal benefit of such preparation (Anderson et al., 2006), it does demonstrate that students who receive thorough cultural orientation before departure show significantly better adaptation outcomes.

The findings suggest that pre-departure data (both IDI scores and reflections) can be used to identify students showing initial tendencies toward Separation or Marginalization, as these students may require additional support to develop effective cultural adaptation strategies. Furthermore, given the observed gender differences in adaptation patterns, pre-departure programs should incorporate gender-sensitive approaches that address the different ways male and female students may experience and process cultural transitions. For instance, pre-departure activities for male students could explicitly focus on the value of relational engagement over logistical competence, challenging the perception that functional problem-solving is sufficient for deep cultural learning.

The study also highlights the potential need for robust during-program support mechanisms (Kuffuor et al., 2024). While our study did not use a control group to test the effectiveness of reflections, other research emphasizes that regular reflection activities are crucial for helping students process their cultural experiences meaningfully (Jackson, 2018). Our findings support this assertion by showing that the students who progressed were those who actively engaged in the provided reflection handbook and suggest that programs should implement structured opportunities for cultural engagement that accommodate different acculturation strategies. The presence of four distinct trajectories highlights that interventions must be tailored to the individual student's developmental stage, rather than assuming a single intervention is universally effective. These opportunities should be flexible enough to support students at various stages of cultural adaptation while challenging them to move beyond their comfort zones. Additionally, the implementation of peer support systems can create a supportive environment where students can share experiences and strategies for navigating cultural differences.

Program assessment emerges as another critical area for practical application. Our findings indicate the need for regular monitoring of student adaptation through mixed-method assessment tools, allowing program administrators to identify and address adaptation challenges early in the experience. This monitoring should include specific attention to students showing signs of cultural resistance or regression, enabling the implementation of targeted intervention strategies. Given the marked differences in adaptation patterns between male and female students, programs should develop gender-specific support mechanisms and assessment criteria to optimize adaptation outcomes for all participants. For the STEM-focused incoming first-year cohort,

linking cultural competence to required professional skills like global teamwork and ethical decision-making could increase engagement for students who may initially prioritize technical skills. These assessment practices should be ongoing and dynamic, allowing for real-time adjustments to program elements based on student needs and responses.

Beyond these immediate program elements, our findings suggest the importance of creating sustainable support structures that extend beyond the study abroad experience itself. Programs should consider implementing post-return activities that help students integrate their cultural learning into their broader academic and personal development. This might include mentoring opportunities where returning students can share their experiences with future participants, creating a cycle of peer support and cultural learning that enhances the program's effectiveness over time. Through these comprehensive practical applications, study abroad programs can better facilitate positive cultural adaptation and meaningful intercultural competence development among incoming first-year students.

## **7. Conclusion, limitations, and future work**

This study provides valuable insights into the complex dynamics of cultural adaptation among incoming first-year students during short-term study abroad experiences. The identification of four distinct adaptation patterns - Resisters, Seekers, Adapters, and Embracers - demonstrates the varied ways students navigate cultural transitions. The finding that female students showed greater propensity for cultural integration suggests important gender differences in intercultural competence development.

The research highlights the importance of structured support systems and reflection activities in facilitating positive cultural adaptation. The success of students who progressed to Integration emphasizes the potential for meaningful intercultural development even in short-term study abroad experiences, while the regression of some students into Marginalization underscores the need for targeted intervention strategies.

This study is limited by a small sample size and a focus on a specific cohort of incoming first-year students, which may not represent all demographics or academic disciplines. Additionally, this study's reliance on self-reported reflections introduces the potential for bias in how students perceive and document their intercultural experiences. Future studies with larger, more

diverse samples and additional quantitative measures could provide further validation. Future studies could also triangulate self-reported reflections with instructor observations or peer assessments to create a more robust measure of engagement.

Future research could investigate how factors such as gender, discipline, and pre-existing cultural exposure impact intercultural competence outcomes in study abroad programs. Expanding this research to include post-program follow-up could provide insights into the long-term impact of study abroad experiences on intercultural competencies. Additionally, examining the effects of varying types and durations of supplementary activities could offer evidence on the optimal design for fostering intercultural growth among students.

## **Acknowledgments**

The authors gratefully acknowledge the support of the Purdue Office of Globalization for their contributions to this work.

## **Ethical approval**

Ethical approval of this study was obtained from the Purdue University Institutional Review Board (ref. STUDY-IRB-2023-137).

## **Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## **Data availability statement**

The data that support the findings of this study involve student participants and are not publicly available due to privacy considerations. Requests to access the data may be directed to the corresponding author, who will consider them on a case-by-case basis subject to ethical and institutional guidelines.

## **CRedit author statement**

**Sakhi Aggrawal:** Conceptualization, Methodology, Writing - Original Draft, Writing - Review & Editing, Visualization. **Aparajita Jaiswal:** Supervision, Methodology, Data Curation, Writing - Review & Editing, Validation. **Vidya Madana:** Formal analysis, Writing - Original Draft, Writing - Review & Editing.

## References

- Adams, J. J., Love, C., Armstrong, C., Patel, D. A., Jaiswal, A., Aggrawal, S., & Starr, L. (2025). Exploring the Interplay Between Teamwork and Intercultural Competence in STEM Education. In *2025 ASEE Annual Conference & Exposition, Canada*. <https://doi.org/10.18260/1-2--56542>
- Aggrawal, S., Jaiswal, A., & Dewan, A. (2024). Enhancing Intercultural Competence Through Structured Study Abroad Program. *2024 IEEE Frontiers in Education Conference (FIE), Washington, DC, USA*. <https://doi.org/10.1109/FIE61694.2024.10893564>
- Aggrawal, S., & Magana, A. J. (2024). Teamwork conflict management training and conflict resolution practice via large language models. *Future Internet*, 16(5), 177. <https://doi.org/10.3390/fi16050177>
- Anderson, P. H., Lawton, L., Rexeisen, R. J., & Hubbard, A. C. (2006). Short-term study abroad and intercultural sensitivity: A pilot study. *International Journal of Intercultural Relations*, 30(4), 457–469. <https://doi.org/10.1016/j.ijintrel.2005.10.004>
- Bahrami, P., Kim, Y., Jaiswal, A., Patel, D., Aggrawal, S., & Magana, A. J. (2023). Information technology undergraduate students' intercultural value orientations and their beliefs about the influence of such orientations on teamwork interactions. *Trends in Higher Education*, 2(2), 270–282. <https://doi.org/10.3390/higheredu2020014>
- Berg, M. V., Connor-Linton, J., & Paige, R. M. (2009). The Georgetown Consortium Project: Interventions for Student Learning Abroad. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 18(1), Article 1. <https://doi.org/10.36366/frontiers.v18i1.251>
- Berry, J. W. (1997). Immigration, Acculturation, and Adaptation. *Applied Psychology*, 46(1), 5–34. <https://doi.org/10.1111/j.1464-0597.1997.tb01087.x>
- Berry, J. W. (2005). Acculturation: Living successfully in two cultures. *International Journal of Intercultural Relations*, 29(6), 697–712. <https://doi.org/10.1016/j.ijintrel.2005.07.013>
- Bittinger, M., Jin, L., & Dou, X. K. (2022). From Pre-Freshman Abroad to Freshman On-Campus: Examining Intercultural Competence Development Through an Extended Journey. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 34(1), 61–96. <https://doi.org/10.36366/frontiers.v34i1.636>
- Bloom, M., & Miranda, A. (2015). Intercultural sensitivity through short-term study abroad. *Language and intercultural communication*, 15(4), 567–580. <https://doi.org/10.1080/14708477.2015.1056795>
- Choy, B., Arunachalam, K., Taylor, M., & Lee, A. (2021). Systematic review: Acculturation strategies and their impact on the mental health of migrant populations. *Public Health in Practice*, 2, 100069. <https://doi.org/10.1016/j.puhip.2020.100069>
- Cordua, F., & Netz, N. (2022). Why do women more often intend to study abroad than men? *Higher Education*, 83(5), 1079–1101. <https://doi.org/10.1007/s10734-021-00731-6>
- Deardorff, D. K. (2006). Identification and assessment of intercultural competence as a student outcome of internationalization. *Journal of Studies in International Education*, 10(3), 241–266. <https://doi.org/10.1177/1028315306287002>
- DeCrescenzo, Peter, & Jangha, S. (2023) GIFTS: Making Research Experiences Meaningful through Critical Self-Reflection. *2023 ASEE Annual Conference & Exposition, USA*. <http://doi.org/10.18260/1-2--43807>
- Demetry, C., & Vaz, R. F. (2017). Influence of an Education Abroad Program on the Intercultural Sensitivity of STEM Undergraduates: A Mixed Methods Study. *Advances in Engineering Education*, 6(1). <https://eric.ed.gov/?id=EJ1138841>
- Dwyer, M. M. (2004). More Is Better: The Impact of Study Abroad Program Duration. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 10(1), 151–164. <https://doi.org/10.36366/frontiers.v10i1.139>

- Grant, J. L. (2019). *Development of Intercultural Competence Through Short-Term Study Abroad Programming* [Master's thesis, Purdue University Graduate School].  
<https://doi.org/10.25394/PGS.8279381>
- Guillén-Yparrea, N., & Ramírez-Montoya, M. S. (2023). Intercultural Competencies in Higher Education: A systematic review from 2016 to 2021. *Cogent Education*, 10(1), 2167360.  
<https://doi.org/10.1080/2331186X.2023.2167360>
- Hammer, M. R. (2011). Additional cross-cultural validity testing of the Intercultural Development Inventory. *International journal of intercultural relations*, 35(4), 474-487.  
<https://doi.org/10.1016/j.ijintrel.2011.02.014>
- Hensista, I., Guddeti, S., Patel, D. A., Aggrawal, S., Nanda, G., & Magana, A. J. (2023). Transformative Pedagogy as a Reflective Approach for Promoting Intercultural Self-Awareness in the Context of Teamwork. *2023 IEEE Frontiers in Education Conference (FIE), College Station, TX, USA*, 1-6. <https://doi.org/10.1109/FIE58773.2023.10343079>
- Inoue, M., Waithaka, E., Ihara, E. S., Tompkins, C. J., Donnelly, C., & Spinelli, L. (2023). Exploring Students' Experience of Study Abroad: Short Programs in Japan. *The International Journal of Diversity in Education*, 23(2), 37. <https://doi.org/10.18848/2327-0020/CGP/v23i02/37-49>
- Jackson, J. (2018). *Interculturality in International Education*. Routledge.
- Jaiswal, A., Aggrawal, S., & Madana, V. R. (2025a). Gender differences in global identity development: Implications for intercultural competence in higher education. In *2025 Collaborative Network for Engineering & Computing Diversity (CoNECD), USA*.  
<http://doi.org/10.18260/1-2--54093>
- Jaiswal, A., Aggrawal, S., & Madana, V. R. (2025b). Exploring Gender Dynamics in Intercultural Competence Development through a Study Abroad Program. In *2025 Collaborative Network for Engineering & Computing Diversity (CoNECD), USA*. <http://doi.org/10.18260/1-2--54088>
- Jaiswal, A., & Sapkota, M. (2024). Global horizons: Assessing the impact of study abroad programs on intercultural competence development pre-college technology students. *Journal of International Engineering Education*, 6(1), 2.  
<https://doi.org/10.23860/jiee.2024.06.01.02>
- Jaiswal, A., Sapkota, M., & Acheson, K. (2024). Bridging borders: Assessing the impact of semester-long study abroad programs on intercultural competence development in undergraduate engineering students. *International Journal of STEM Education*, 11(1), 24.  
<https://doi.org/10.1186/s40594-024-00483-6>
- Jin, L., Jaiswal, A., Jones, D. C., Sapkota, M., McClure, S. N., & Stahl, A. (2024). Enhancing Intercultural Learning in Study Abroad Through an Online Curriculum in Group-Mentored Intervention. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 36(1), 350-383. <https://frontiersjournal.org/index.php/Frontiers/article/view/811>
- Kimura, H., & Hayashi, B. (2019). Identity development through study abroad experiences: Storied accounts. *Studies in Second Language Learning and Teaching*, 9(3), 473-493.
- Krsmanovic, M. (2020). "I Was New and I Was Afraid": The Acculturation Strategies Adopted by International First-Year Undergraduate Students in the United States. *Journal of International Students*, 10(4), 954-975. <https://doi.org/10.32674/jis.v10i4.1160>
- Kuffuor, O., Aggrawal, S., Jaiswal, A., Smith, R. J., & Morris, P. V. (2024). Transformative pathways: Implementing intercultural competence development in higher education using Kotter's change model. *Education Sciences*, 14(7), 686.  
<https://doi.org/10.3390/educsci14070686>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. FT press.
- Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 1986(30), 73-84.  
<https://doi.org/10.1002/ev.1427>

- Lomicka, L., & Ducate, L. (2021). Using technology, reflection, and noticing to promote intercultural learning during short-term study abroad. *Computer Assisted Language Learning*, 34(1-2), 35-65. <https://doi.org/10.1080/09588221.2019.1640746>
- Lou, K. H., & Bosley, G. W. (2023). Facilitating intercultural learning abroad: The intentional, targeted intervention model. In *Student learning abroad* (pp. 335-359). Routledge. <https://doi.org/10.4324/9781003447184-17>
- Magana, A. J., Amuah, T., Aggrawal, S., & Patel, D. A. (2023). Teamwork dynamics in the context of large-size software development courses. *International Journal of STEM Education*, 10(1), 57. <https://doi.org/10.1186/s40594-023-00451-6>
- Maharaja, G. (2018). The Impact of Study Abroad on College Students' Intercultural Competence and Personal Development. *International Research and Review*, Vol. 7 Issue 2, p18-41. <https://eric.ed.gov/?id=Ej1188735>
- Nelson, J., Cheh, K., Garg, A., Dewan, A., Jaiswal, A., & Aggrawal, S. (2025). Building Intercultural Skills in Engineering Students through Study Abroad. In *2025 ASEE Annual Conference & Exposition, Canada*. <http://doi.org/10.18260/1-2--56040>
- Niehaus, E., & Nyunt, G. (2023). Uncovering the potential learning in short-term study abroad. *Journal of Student Affairs Research and Practice*, 60(3), 417-432. <https://doi.org/10.1080/19496591.2021.1997758>
- Passarelli, A. M., & Kolb, D. A. (2023). Using experiential learning theory to promote student learning and development in programs of education abroad. In *Student learning abroad* (pp. 137-161). Routledge.
- Pinto, S. (2018). Intercultural competence in higher education: Academics' perspectives. *On the Horizon*, 26(2), 137-147. <https://doi.org/10.1108/OTH-02-2018-0011>
- Prieto-Arranz, J. I., Juan-Garau, M., & Mesquida-Mesquida, F. (2023). "Open Your Mind, Sharpen Your Wits": A Narrative Approach to the Benefits of Study Abroad as Perceived by Erasmus+ Students. *Journal of Language, Identity & Education*, 22(3), 216-231. <https://doi.org/10.1080/15348458.2020.1871352>
- Puckett, T., & Lind, N. S. (2020). *Cultural competence in higher education*. Emerald Group Publishing. [https://books.google.com/books?hl=en&lr=&id=x\\_L3DwAAQBAJ&oi=fnd&pg=PR1&dq=Cultural+competence+in+higher+education.+Emerald+Publishing+Limited.&ots=qPbrsxCj4U&sig=Hc9LtX2FEKsABrUBGrDxnHBo92k](https://books.google.com/books?hl=en&lr=&id=x_L3DwAAQBAJ&oi=fnd&pg=PR1&dq=Cultural+competence+in+higher+education.+Emerald+Publishing+Limited.&ots=qPbrsxCj4U&sig=Hc9LtX2FEKsABrUBGrDxnHBo92k)
- Sarwari, A. Q., Adnan, H. M., Rahamad, M. S., & Abdul Wahab, M. N. (2024). The Requirements and Importance of Intercultural Communication Competence in the 21st Century. *Sage Open*, 14(2), 21582440241243119. <https://doi.org/10.1177/21582440241243119>
- Spenader, A., Ruis, J., & Bohn-Gettler, C. (2022) Writing for Intercultural Growth on Study Abroad in Australia. *Frontiers: The Interdisciplinary Journal of Study Abroad*. v34(2): 323-350. DOI: <https://doi.org/10.36366/frontiers.v34i2.553>
- Terzuolo, E. R. (2018). Intercultural development in study abroad: Influence of student and program characteristics. *International Journal of Intercultural Relations*, 65, 86-95. <https://doi.org/10.1016/j.ijintrel.2018.05.001>
- Tompkins, A., Cook, T., Miller, E., & LePeau, L. A. (2017). Gender Influences on Students' Study Abroad Participation and Intercultural Competence. *Journal of Student Affairs Research and Practice*, 54(2), 204-216. <https://doi.org/10.1080/19496591.2017.1284671>
- Tomkins, L., & Ulus, E. (2016). 'Oh, was that "experiential learning"?!' Spaces, synergies and surprises with Kolb's learning cycle. *Management Learning*, 47(2), 158-178. <https://doi.org/10.1177/1350507615587451>
- Vande Berg, M., Connor-Linton, J., & Paige, R. M. (2009). The Georgetown consortium project: Interventions for student learning abroad. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 18(1), 1-75. <https://doi.org/10.36366/frontiers.v18i1.251>

- Verbyla, M. E., Vernaza-Hernandez, V., & Feldman, A. (2024). International Research Experiences and Global Competency Development for Graduate Students in Engineering and Science. *Journal of Studies in International Education*, 28(2), 221–239. <https://doi.org/10.1177/10283153231172019>
- Wang, J., & Halenko, N. (2022). Developing the use of formulaic language for study abroad: A targeted instructional intervention. *The Language Learning Journal*, 50(4), 409–426. <https://doi.org/10.1080/09571736.2022.2088446>
- Witkowsky, P., & Mendez, S. L. (2018). Influence of a Short-Term Study Abroad Experience on Professional Competencies and Career Aspirations of Graduate Students in Student Affairs. *Journal of College Student Development*, 59(6), 769–775. <https://dx.doi.org/10.1353/csd.2018.0073>

## Author Biography

**Sakhi Aggrawal**, Ph.D., is a lecturer and computing and engineering education researcher at Purdue University, focusing on AI-enabled learning, self-regulated learning, and workforce readiness. She holds a Ph.D. in Technology and B.S. in Computer and Information Technology from Purdue, and M.S. in Business Analytics from Imperial College London. As Founder and Director of the Institute for Educational Innovation & Technology, she leads interdisciplinary initiatives connecting research, teaching, and technology to prepare learners for evolving global workplaces.

**Aparajita Jaiswal**, Ph.D., is a Lecturer in the EPICS program at the College of Engineering, Purdue University and a STEM education researcher. Her work focuses on experiential learning, Human-AI interaction, safety engineering education, and community-engaged engineering. She holds a Ph.D. in Technology and an MBA. Her research focusses on mixed-method approaches to examine how reflection, sociotechnical awareness, and human-centered design shape STEM learning and professional identity development.

**Vidya Madana** is an undergraduate student in the Department of Computer Science at Purdue University, concentrating on machine intelligence and software engineering. She is expected to graduate with a Bachelor of Science degree in May 2027. Vidya's research interests include artificial intelligence, machine learning, and data visualization. In addition to her academic pursuits, she has experience in STEM education, robotics, and journalism, reflecting her broad interests and diverse skill set.