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What Is Intercultural Communication Competence and Why We Need to Talk
About It: A Call for Awareness among STEM Faculty

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What intercultural communication competence is and why we need to talk about it: A call for awareness among STEM faculty

Abstract:

In this theory paper we review relevant literature to provide a strong rationale for the essential role of intercultural communication competence in advising international graduate students in science, technology, engineering, and mathematics (STEM). International students make up a significant portion of graduate student enrollments at US universities, especially in STEM disciplines. Research has shown that graduate students' educational experiences are significantly impacted by their relationship with their adviser, yet this relationship is one of the most frequently mentioned challenges by international students. Based on the literature review, we argue that being aware of intercultural competence is essential for STEM faculty to provide positive advising experiences for international graduate students. Despite the promise of intercultural competence promoting effective and healthy advising relationships, there is limited literature about its use at the graduate level in STEM. Because of the huge participation of Chinese students in the US educational system, this paper includes a fictional case study. Using the model of intercultural communication competence, suggestions and strategies are provided in order to offer ideas for STEM faculty to build a healthy relationship with a new Chinese graduate student.

1. Introduction:

International students are a critical part of enrollments of graduate education at US universities, especially in science, technology, engineering, and mathematics (STEM) disciplines. The Institute of International Education's 2021 Open Doors report reveals that, in the academic year 2020-2021, the US hosted a total of 914,095 international students [1]. This data emphasizes the significant role played by international students in the graduate education landscape of the US. The report further highlights that a majority of international students (54%) sought a major in STEM [1]. Moreover, the report emphasizes that engineering continues to be the most sought-after major among international students, with a staggering 21% opting to pursue it. The significance of international students for the US higher education system and the country's economic growth cannot be overstated. With diverse perspectives and experiences, international students bring immense value to the classroom, enriching the educational experience for all students [2]–[5]. Additionally, international students contribute significantly to the US economy by creating jobs and supporting local businesses [6].

A significant part of any graduate student's experience is their relationship with their adviser. Extensive studies on doctoral education have emphasized the vital role of advisers in guiding students' learning and promoting their development as researchers [7], [8], [9]–[11]. Advisers

are often regarded as the most significant person in a student's journey because of their critical influence on the student's academic progress. While negative relationships with advisers can result in similar academic consequences for both international and domestic students, international students are more vulnerable to stress due to the possibility of inadequate academic progress leading to the revocation of their student visa [12]. Unfortunately, the relationship with advisers is often cited as one of the most common challenges faced by international students [13]. Given the critical role of the adviser in a student's academic journey and the potential consequences of inadequate academic progress for international students, it is crucial to recognize the unique challenges faced by international students and provide them with appropriate support.

To provide international doctoral students with positive advising experiences, it is essential for STEM faculty to possess intercultural communication competence (ICC). In this article, we adopt Griffith et al.'s definition of ICC, which refers to an individual's ability to gather, interpret, and effectively respond to culturally diverse cues in a multicultural environment [14]. Prior literature demonstrated that international students face particular challenges, such as general living adjustment, including becoming familiar with life in America; academic adjustment, including feeling confident with a new language and the American university system; sociocultural adjustment, including to cultural norms; and personal psychological adjustment, which can cause feelings of loneliness, isolation, and lost identity [15]. Advising international graduate students is therefore critical to helping them surmount these obstacles, but it can be more complex than advising domestic students [16]–[18]. With the growing diversity in higher education, ICC is vital for faculty to comprehend and interact with students from different cultures [19]. However, there is limited literature on how faculty can acquire and improve this skill.

This theory paper discusses the role of ICC as a tool for faculty who advise international students and will focus on STEM fields. This article consists of three sections: a literature review of the experiences of international graduate students and faculty perspectives on working with international students, a review of the ICC framework, and an exploration of a case method for teaching.

2. Literature review

a. What do graduate international students say about studying abroad?

International students choose to pursue their graduate studies in the United States for a variety of reasons. Han and Appelbaum surveyed domestic and international graduate students enrolled in STEM disciplines at the ten U.S. institutions with the largest number of international students. They found that the main reasons cited by foreign students for pursuing

their degrees in the US were the higher quality of education, future career opportunities, the desire to experience living abroad, the opportunity to work with specific faculty, and the possibility of applying for residence in the United States [20]. This suggests that the United States is an attractive destination for international students who seek quality education, career opportunities, and a path to residency.

Language-related issues cause significant challenges for international graduate students, particularly for students from non-English speaking countries. English language challenges can hinder students' academic success and professional development [21]. The issue of English proficiency is a major concern for many international students, who may struggle with taking required English courses upon arriving, which can put them behind other students who do not have this requirement [22]. In addition, many students from countries like South Korea, Vietnam, and China find translating their research into English to be a significant challenge, even though they may have the ability to explain complex phenomena in their mother language [21]. Language-related anxiety can also affect students' participation in class, with some reporting negative treatment due to their accent or lack of English language proficiency [23]. Zhou and Huang mention that self-expression, listening challenges, and limited vocabulary size are also common concerns among international graduate students. To overcome these challenges, many students rely on individual strategies such as using examples, reducing, and altering their messages, and approximating their language use [24].

International graduate students often face negative experiences and discriminatory treatment on campus due to being perceived as one-dimensional, which can be attributed to the expectation that they should assimilate into the dominant campus culture. This expectation removes responsibility from universities to create an inclusive environment [23]. Mwangi, Changamire, and Mosselson found that international students experience barriers on campus due to assumptions made about them based on their country of origin, race, age, and gender. Moreover, these students often describe a lack of ethnic diversity and a predominant whiteness on their campuses, which can be hugely different from their countries of origin [23]. In addition, the classroom presents various challenges, including participation expectations, discussions that center the US context, limited space for multicultural perspectives, and conflicting worldviews [23], [25]. However, Yang and MacCallum found that despite the challenges and difficulties international graduate students face, with multilateral and reciprocal understanding, accommodation, and respect for differences, they were able to adapt and be successful [25].

Financial stress is a significant issue for international graduate students. Financial issues impact their enrollment decisions and academic performance [26]. Financial support is crucial for international students to enroll and persist in their studies. However, many international graduate students face financial concerns that distract them from their academic work and

create a great deal of stress [22]. Le and Gardner found that financial support was important for students in their decision to enroll at an institution and to persist in their studies [22]. Mwangi, Changamire, and Mosselson found that financial concerns were a major issue for participants in their study, creating stress and distractions from academic work [23]. Lastly, Yang and MacCallum note that financial challenges, such as a shortage of funding, are a reality for international graduate students, but with support and understanding, these students can adapt and achieve despite these difficulties [25].

The success of international graduate students is greatly influenced by the social and academic relationships they build. Research indicates that peer and graduate student support can significantly contribute to international students' success [22], [27]. Developing academic-centered relationships with professors and peers is critical for sharing knowledge and experiences, which can help international students overcome academic and social challenges. Although some international students report being too busy to engage in social activities, studies have shown that having a friend who understands their situation can be essential during stressful times [21], [27].

Lastly, the success of doctoral STEM students is heavily influenced by the quality of their relationship with their faculty adviser. The need for support from faculty and advisers was mentioned as important to international graduate students [21], [22]. This relationship can help students visualize their future in the field and undergo the process of identity development, while strained relationships can hinder the process and lead to negative attitudes towards the future [21]. Communication issues due to differences in values and beliefs [25] and limited research support from advisers [28] are also significant factors that can demotivate students.

b. What do faculty say about graduate international students?

International students are academically well-prepared and hardworking. Research studies have consistently highlighted the exceptional academic performance of international students [29], [30]. These students are highly motivated and goal oriented, striving to achieve their academic goals by putting in the necessary effort and hard work [31]. Unruh's study emphasizes the determination and commitment of international students, who go through immense effort to come to study in the US, often leaving behind their families and loved ones [31].

International students contribute to the internationalization of campuses and bring diverse views and global perspectives to class discussions and assignments. Their presence on campuses helps to bring a diverse range of views and global perspectives, enriching the educational experience for all students. International students are also often recruited to fill research assistant positions, bringing unique skills and knowledge to research teams [32], [33].

Additionally, the presence of international students contributes to the internationalization of campuses, creating a global environment that promotes cultural awareness, respect, and understanding [32], [33].

Faculty members have differing attitudes and approaches towards international students. Some faculty members use the same approach to work with both domestic and international students. Those who do tend to claim that international and domestic students are responsible for asking for help and solving their problems because they are adults [31]. However, one study highlighted that some faculty members believe that international students deserve more departmental consideration than they currently receive, recognizing the extra challenges they face [33]. No matter what the approach is, faculty members play a critical role in the success of international students, and their attitudes and approaches can have a significant impact on the students' experience and academic achievements.

Faculty from hard sciences may have less empathy for the challenges faced by international students. Evidence suggests that some faculty members in engineering departments believe that domestic students may be deterred from enrolling in their programs if the number of international students is perceived as too high [32], [33]. This has led to efforts to keep international student numbers low enough to maintain a perceived balance that would be more acceptable to domestic students. Such attitudes indicate that some faculty members in hard sciences may be less sympathetic to the unique challenges faced by international students. While these attitudes may not be universal, they highlight the need for increased awareness and support for international students in these fields [32], [33].

International students face unique challenges related to language proficiency and cultural differences. Faculty report that issues with international students' understanding and use of English is a major concern because these issues lead to struggles with academic tasks [29], [30], [33]. As a result, some faculty members have to spend extra time supporting international students due to language-related challenges [29], [33]. In addition, studies show that language-related problems contribute to the lack of interaction between international students and domestic students, which leads to their isolation [30], [34]. Sometimes, faculty members incorrectly believe that international students want to be alone, which is associated with a lack of time dedicated to developing relationships with local students [33], [34]. These unique challenges faced by international students can impact their academic performance and social integration, which requires support and understanding from the faculty and the university.

International students face challenges because of their lack of familiarity with American higher educational culture. International students may not be accustomed to American academic expectations, such as classroom participation. Consequently, several studies have shown that students' engagement in class activities and academic performance are impacted by their lack

of familiarity with American college culture [29], [31], [32], [35]. Additionally, international students may have trouble building relationships with faculty members. For example, professors mention that some international students provide gifts as a way of expressing their gratitude, however, in the context of American academic culture, this can be considered unusual or unacceptable behavior [35]. Moreover, international students do not know how to address problems in the classroom and fear being reprimanded if they try [30], [31], [33]. International students from Asian countries usually are not able to say that they do not understand instructions because they believe such statements would be evidence of ignorance [29]. As a result, faculty members may not always be aware of the struggles faced by international students, which can lead to a lack of support and missed opportunities for academic success.

International students face unique challenges, but there are ways to work with them effectively. One effective strategy is involving them in US culture. Faculty members who invite international students to their homes during national events or holidays can help them feel more included and connected to their new environment [30]. Additionally, open and honest communication is critical in successfully working with international students [29], [30]. Faculty who successfully engage with international students are willing to learn about other cultures [35] and make changes to their communication style, such as limiting the use of slang [31], [35]. Being respectful, patient, and empathetic is also important [30]. Faculty who have experience abroad are more culturally aware and understanding of what it is like to be a foreigner [30]. By recognizing the unique challenges faced by international students and employing strategies to address these challenges, faculty can build meaningful relationships with these students and enhance the quality of education for everyone.

3. Theoretical Framework: Intercultural communication competence

ICC is a crucial skill that researchers have been exploring for the last two decades. A review of the literature reveals a multitude of definitions of ICC [14]. This variability in the content of ICC models and dimensions presents several challenges. For this reason, Griffith and others [14] propose a framework and operational definition to serve as the basis for the development of the concept of ICC in higher education research. This operational definition is based on prior research and states that ICC "reflects a person's capability to gather, interpret, and act upon these radically different cues to function effectively across cultural settings or in a multicultural situation" [22, p.105]. Figure 1 summarizes the framework, which has three dimensions: approach, analyze, and act.
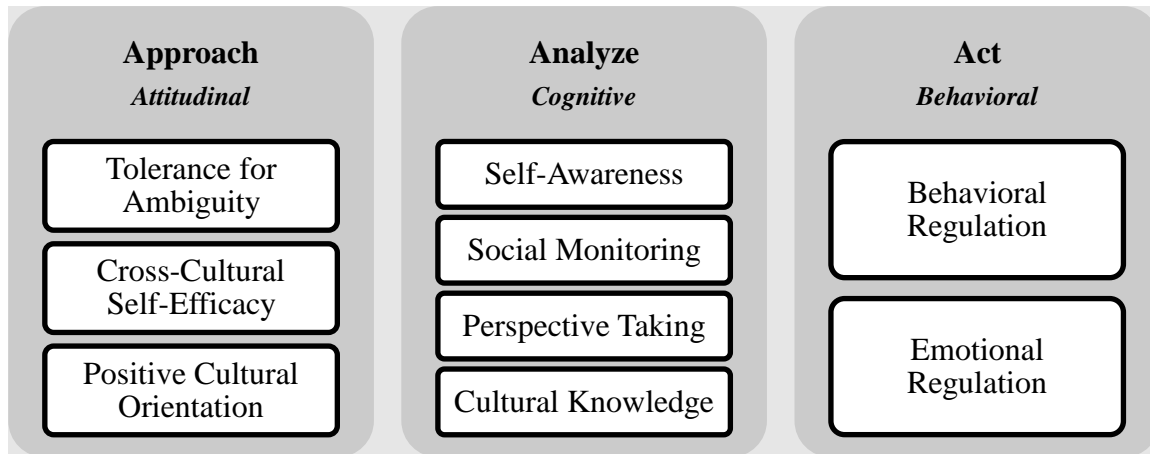
Figure 1 Framework of Intercultural Communication Competence by [14]

a. Approach dimension

This dimension includes the likelihood that one will voluntarily initiate and maintain intercultural contact [14]. The sub-dimensions are tolerance for ambiguity, self-efficacy, and positive cultural orientation.

- Tolerance for ambiguity: The ability to remain calm and maintain well-being under challenging or chaotic circumstances without sacrificing effectiveness. It is related to having interactions with individuals from different cultural backgrounds.
- Positive cultural orientation: The ability to favorably evaluate cross-cultural situations. This concept is related to cosmopolitanism, reduced ethnocentrism, open-mindedness, inquisitiveness, curiosity, and respect.
- Cultural self-efficacy: The ability to believe that you can achieve a goal in a cross-cultural context.

b. Analyze dimension

This dimension describes a person's capacity to take in, assess, and synthesize pertinent information without the prejudice of preconceived beliefs and stereotypical thinking [14]. The sub-dimensions are self-awareness, social monitoring, perspective taking, and cultural knowledge.

- Self-awareness: The ability to understand the impact of one's own culture, values, preferences, and previous experiences on one's cognitive, emotional, and behavioral responses.

- Social monitoring: During a social interaction, paying attention to the other's body language, verbal, and nonverbal behaviors, and others' responses to one's own actions and signals.
- Perspective taking: The ability to actively take consideration of others' potential viewpoints, or actively refrain from allowing preconceived cultural schema to interfere with information processing.
- Cultural knowledge application: The ability to consider a broad range of information, including culture-general and culture-specific information, as well as historical and geopolitical information, in one's decision-making processes.

c. Act dimension

This dimension includes the behaviors highlighted in the analyze dimension that are used to assess individuals' ability to translate thought into action while maintaining control in potentially challenging and stressful situations [14]. The sub-dimensions are behavioral regulation and emotional regulation.

- Behavioral regulation: The ability to actively monitor and revise personal behavior to engage in appropriate cultural behavior and avoid engaging in inappropriate cultural behavior.
- Emotional regulation: The ability to monitor and revise emotions in an automatic or controlled manner.

4. Case method for teaching

In this article, we utilize a case method for teaching to outline a hypothetical international student's experience. Specifically, the case study focuses on how faculty can support new international students using ICC within the context of graduate education. A case method teaching is an active form of instruction that uses a detailed description of a unit of study to engage students in active learning [37]. This method of instruction is popular in a variety of fields including law, business, and medicine. In the current case study, the unit of study is *Enmei,* a new international graduate student. By following Enmei's journey and analyzing the various challenges she faces, faculty can gain insights into the ways ICC can be used to help new international students navigate the complexities of graduate education.

Because China is the number one country of origin of international graduate students [1], the case study focuses on the experiences of a Chinese student. This case was adapted from [38], in which Lin and Liu, through composite stories, presented challenges that Chinese students experience when they study abroad. They also offer recommendations to advisers to better

support those students. These stories are based on real experiences with fictional characters, yet the main information presented might rely on valid empirical data [38].

To engage our target audience, the authors adapted this narrative to create a fictional relationship between *Enmei* (a graduate student) and the audience (you, the reader) as her graduate adviser. Here we present the case, tie the main points of the case back to our literature review, then provide suggestions for faculty who wish to improve their intercultural communication.

a. Instructive case

Enmei is your new graduate student. She is from China, and this is her first time in the US. After the department orientation session for new students, she approached you and asked to meet with you one on one. At your appointment two days later, she showed up with a list of 18 questions. She was particularly interested in making US friends. At your next meeting with her, you asked how things were going. She shyly told you that when she introduced herself to a classmate, he said, "That's nice that you are here, but I don't need any more friends." Because of that experience, Enmei is now focused on getting to know other students from China. Enmei got straight As for all four of the courses she took in the first semester, but she shared with you that she had to work much harder than domestic students in order to get the same grade. For written assignments, she would always try to finish them a long time before due dates, so that she could have time to book an appointment with the Writing Center to help edit her writing. In class, she felt it was much easier for US students to participate in discussions, because they used English as their first language so well. They could put up their hands, start talking, and organize their thoughts as they spoke. Enmei felt she must have a fully developed thought first, and then figure out how to put that thought into good English, before she could put up her hand. One assignment was particularly challenging for Enmei, a whole-class presentation that was 20% of the final grade. She started preparing for it three weeks before her presentation because her reading speed was slower than her classmates', so she needed many more hours to read the materials, often having to look up words in an English–Chinese dictionary. She then wrote down every word of her presentation and tried to memorize it. After a lot of practice, she could recite the whole thing without a single pause during her presentation in class, but she purposefully paused a few times to sound natural and spontaneous. She did not want her instructor and classmates to know that she was reciting from a written script. For another particularly challenging assignment, Enmei was paired with a domestic student. There were five mini tasks, so Enmei volunteered to do three of them. Nevertheless, one week before the due date, her US partner asked her if she could do one more, as she was getting too busy with another course. Enmei agreed. About two

days before the due date, Enmei checked with her partner again and found that she had not done the only task she was supposed to do. Enmei ended up doing all five tasks. Enmei thought about reporting her, but she had heard that Chinese students were often blamed for dragging down scores of group projects with domestic students, so she decided not to do it.

Adapted from [38]

b. Relationship of case to the literature

- She has many questions about how to be ready for this new experience.

Our literature review (Section 2) highlights that international students do not have enough familiarity with the US educational system, but they are described as willing to learn and hardworking (see Section 2 for more details).

- She wanted to make US friends, yet she had a bad experience. So now, she is focused on getting to know other students from China.

The literature review points out that there is a lack of integration between domestic students and international students. In the narrative, we saw that Enmei tried to make friends, but she was unsuccessful (see Section 2 for more details).

- She has good grades; she had to work much harder than domestic students did. Written assignments and presentations are particularly difficult because writing, speaking, and understanding English are so hard. This also affects her participation in class discussions.

Findings from the literature review underline that faculty recognize that international students are hardworking and determined to succeed. In the case study, Enmei showed her motivation and commitment to being a good student and her grades are the result of this. However, one main issue reported by faculty in Section 2 is that international students struggle to use English. Enmei feels that she works harder than her domestic peers due to her unfamiliarity with the language, which also results in less engagement in class activities (see Section 2 for more details).

- She had an issue with one classmate, who was a domestic student, about an assignment. She ended up doing all five tasks because her classmates did not complete their parts.

Due to cultural differences, international students from Asian countries usually do not "say no." In addition, their determination to succeed makes them goal-oriented (see Section 2 for more details).

c. Suggested strategies for faculty to develop ICC using Enmei's case

In this section we will address Enmei's case, providing suggestions and strategies based on the theoretical framework and the literature review. Firstly, it is important to note that ICC only works if faculty are open to understanding others' culture and backgrounds. According to Hofstede "culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" [25, p.3]. In this sense, allowing yourself, as the adviser, to understand different points of view, even if your personal values are different, and showing respect for others is important.

Effective ICC requires openness to learn new information and engage with it. As a faculty member, it is essential to engage in adequate personal reflection before attempting to utilize the following strategies based in the framework of ICC. To support this reflection process, we recommend reflecting on the questions outlined in Table 1 for each dimension of the ICC framework.

Table 1 Reflection Questions

Approach	Questions to ask yourself: - Am I willing to learn about my student's culture? - Am I willing to learn about new cultures? - Am I willing to make an effort to understand the cultural differences between myself and my students? - Am I willing to be open-minded and curious about the differences between my culture and my student's culture? - Do I believe that I am able to deal with ambiguity and uncertainty when addressing students whose cultures differ from my own?

Analyze	Questions to ask yourself: - Do I understand the impact of my culture on my behavior and mindset? - Am I willing to remove or change preconceived beliefs or ideas about different cultures? - Am I willing to consider new information in my decision-making process? - Will I be able to incorporate new cultural knowledge into my conversations and actions?
Act	Questions to ask yourself: - Am I willing to periodically revise my personal behavior to engage in appropriate cultural behavior? - Am I willing to periodically revise my emotions to engage in appropriate cultural behavior?

- **Strategy 1** – Active listening

Active listening is an essential step in understanding people from different cultures, and it can facilitate the establishment of a positive relationship between advisers and advisees from diverse backgrounds. Zhang argues that without being committed to connect with their students, professors cannot fully understand the issues that their students are facing [40]. Our literature review revealed that communication-centered problems often arise between international and domestic students. If you are a faculty member leading a research group, we recommend paying attention to group dynamics to create a positive atmosphere and prevent communication-related issues. From the faculty perspective, American students sometimes do not make efforts to reach out to their international peers [34], incentivizing your US students to engage in active listening practices can not only benefit their international peers but also positively impact the group's overall dynamics. By promoting active listening, your students can learn to appreciate diverse perspectives and better understand the experiences of their international peers.

- **Strategy 2** – Increasing cultural awareness

Increasing cultural awareness allows you to understand the beliefs, values, styles of communication, and traditions of your international students. Prior research highlights that understanding their cultural differences from their advisees may help advisers guide their students [40]. Moreover, cultural awareness also helps us understand our own culture and communication style, which could be useful in professional settings [40], [41].

Departments could encourage faculty and staff to develop cultural awareness. Prior research suggests that faculty should take part in culture-enriching activities [40], [42]. Department authorities also could incorporate training into faculty development initiatives [40]. Another strategy is establishing a relationship with the office of international affairs (or a similar office) and using their resources to better understand international students. This relationship usually does not happen organically because of university structures [33]. Finally, departments should deliberately increase the diversity of research groups, as doing this will give students and faculty the opportunity to become more aware of other cultures [34].

As a faculty member leading a research group, it is important to pay attention to group dynamics and create a positive atmosphere. One effective strategy for enhancing group dynamics is to increase cultural awareness and celebrate the unique differences of each team member. This could involve various activities, such as celebrating local holidays or inviting international students to share their cultural traditions. By embracing and honoring the diversity of the group, you can foster an inclusive environment where all team members feel valued and respected, which also increases their sense of belonging within the research group.

The internet offers an abundance of resources that can serve as valuable tools for self-education. In order to increase cultural awareness for the benefit of your students, we recommend two tools. These resources can also be used to improve your understanding of your own culture.

1. Hofstede model: The Hofstede model of national culture gives you the opportunity to understand the differences between two cultures. This model consists of six dimensions: power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, long-term versus short-term orientation, and indulgence versus restraint [39].

In Enmei's case, she came to the US and faced a culture that was quite different from the one she is most familiar with. To better understand the cultural differences between China and the US, the Hofstede model is a great resource:

Step 1: Go to the website https://www.hofstede-insights.com/

Step 2: Look at the "Country comparison tool" and select the countries that you want to compare. In the following example, we compared China and the United States. You can read the comparison for the six dimensions of the model in Table 2.

For the purpose of our research, power distance, individualism, and masculinity are the most important of the six dimensions acknowledged in the Hofstede model. We will provide interpretations of these dimensions in further detail in the following section.

Dimensions	American Culture	Chinese Culture
Power distance	Low score	High score
Uncertainty avoidance	Low score	Low score
Individualism	High score	Low score
Masculinity	High score	High score
Long-term orientation	Low score	High score
Indulgence orientation	High score	Low score

Table 2 China and American comparison using the Hofstede model.

Chinese and American populations conceptualize power and inequality in different ways. The power distance dimension is related to a society's feelings about inequality (the fact that all individuals in societies are not equal) [43]. In American culture, it is common for people to believe that inequalities amongst people are not acceptable. For example, the US population expects an equal distribution of power. This is distinct from China, a society that considers inequalities amongst people to be acceptable. This contributes to the perpetuation of the subordinate-superior relationship in which there is no defense against power abuse by superiors. For example, in the educational context, teachers are highly respected and never contradicted because of teachers' authority.

China is a collectivist culture, while the US is an individualist culture. The dimension of individualism versus collectivism is related to the incorporation of persons into primary groups [39]. In the US, it is considered normal for people to look after themselves and their immediate families only. Therefore, at the workplace, employees are expected to be self-reliant and display initiative [44]. Contrarily, China is a highly collectivist culture, where people act in the interests of the group and not necessarily of themselves [44].

In the dimension of masculinity versus femininity, China and US have similar scores. This dimension is related to the division of emotional roles between women and men [39]. This dimension is designed to capture what inspires people in a given society, wanting to be the best (masculine) or liking what you do (feminine) [43]. US society is driven by competition, achievement, and success, with successful people being defined as the "winner" or "best-in-the-field" [44]. As a result, Americans will tend to display and talk freely about their "successes" and achievements in life. Similarly, China has a high score in this dimension. The need to ensure success is exemplified by the fact that many Chinese people will sacrifice

family and leisure priorities to work [44]. For example, Chinese students care very much about their exam scores and ranking, as these are the main defining factors of success in their lives.

2. CultureGrams™: This is a resource for trustworthy cultural information about the countries of the world [45]. You can access CultureGrams™ using your campus library. CultureGrams™ offers reports on nations that go beyond basic statistics to give a unique view on daily life and culture. These reports cover the history, customs, and way of life of people throughout the world.

While it is crucial for faculty members to utilize available resources to gain insight into their students' cultures and better understand them, it is important to note that students are not a homogenous group, even if they come from similar cultural backgrounds. Therefore, faculty members must strike a balance between learning about their students' cultural backgrounds and getting to know the individual, micro-level factors that shape each student's unique perspectives. As such, it is vital that faculty members prioritize building meaningful relationships with their international students and seek to understand their unique experiences, rather than relying solely on cultural stereotypes or assumptions. By doing so, they can create a supportive and inclusive learning environment that benefits all students, regardless of their cultural background.

- **Strategy 3** – Create a culture of respecting differences

Creating a culture where people respect cultural differences is crucial to promoting intercultural communication competence. This involves creating an atmosphere in which mutual respect exists among members. This should be applied at different levels, meaning that the department and research groups levels engage in this practice. Serving as a model of appropriate behavior will make it possible for your peers and students to act in a similar way. Prior research shows that faculty members' background influences their beliefs about international students [14], which means that faculty with experience study abroad (or with being an international student) make faculty deeply empathetic with students experiencing this situation. Because of this connection, authorities should incentivize opportunities to study abroad so future professionals, who may become future faculty, will be more prepared to engage with diverse populations.

In Enmei's case, it is important for you as an advisor to create a supportive and inclusive environment. Encouraging a culture of peer support at the research group level can help Enmei feel comfortable asking questions about how to succeed in class and use the same strategies as her domestic peers. This can also help her build relationships with domestic students, which was identified as another issue in the literature review. By fostering a supportive environment,

you can help Enmei feel more connected and supported in her academic journey as an international student.

- **Strategy 4** – Teaching strategies

The classroom may be the most challenging environment for international students. As we mentioned in the literature review section, faculty use several strategies to work with international students. A great strategy for avoiding misunderstandings is standardizing instructions for assignments [29], which means talking about expectations and criteria of evaluation [29], [40]. Another strategy is giving clear feedback and paying attention to grammar mistakes [29]. This is specifically useful when you are working with non-native English speakers. The literature review shows that in some cultures (particularly Asian culture) asking questions or showing that you do not understand instructions are signs of weakness or ignorance. In this sense, making sure that your international students feel comfortable asking you for clarification is critical to support international students. Finally, according to our literature review, one of the main concerns that faculty have about international students is that they are not familiar with the US higher education system. We suggest that during the first meeting with the advisee, advisers give an overview of the US higher education context or maybe recommend a reading or video about it [40].

In Enmei's case, she is a good student and very hardworking, but had some challenges with class participation and with a particular classmate. To address these challenges, it would be beneficial for her to gain a better understanding of how classes work in the US, as well as strategies to be prepared to participate in class. One effective strategy would be to encourage her to discuss the reading with her peers before class so that she can prepare questions to ask during class. Additionally, she could benefit from gaining a better understanding of the expectations for graduate courses and the higher education system in the US. This could be achieved by having a conversation with her advisor to ensure that she feels more prepared and confident within this system. It is also important for Enmei to understand how to communicate effectively with her instructors. As her advisor, you could encourage her to use office hours and to contact her professor when she needs extra support for assignments.

5. **Conclusion**

Faculty members play a critical role in the academic and personal adjustment and retention of international students, who come from diverse cultural and academic backgrounds. In order to effectively advise and support these students, faculty members must possess intercultural communication competence. This article provides a conceptual discussion on the development of ICC for faculty, particularly those working with international students in STEM fields. Given the high probability of STEM faculty members working with international students, this

discussion is particularly relevant for them. In this sense, by developing ICC, faculty members can better understand and navigate cultural differences and provide more effective support and advising to their international students, ultimately contributing to their success and retention.

The awareness of intercultural communication competence by faculty can have an immediate impact on their teaching and advising styles, as demonstrated by Dericks and colleagues, who found that adviser supportiveness was the most important factor for student satisfaction, even more so than academic qualities [46]. This is particularly crucial in the field of engineering, as it is often characterized as a high-stress culture [47], [48]. By developing intercultural communication competence, faculty can better understand and support the unique needs and challenges faced by international students, leading to increased student satisfaction and retention.

The mental health and well-being of graduate students has become a concern in higher education. Research by Evans and colleagues found that graduate students are over six times more likely to experience depression and anxiety than the general population, highlighting the need for more attention to be paid to this issue [31]. Similarly, another study focusing on graduate students found that a significant proportion of respondents reported experiencing a mental health issue [32]. Given cultural differences, international students may be less likely to disclose mental health problems to their advisers, and advisers may struggle to identify symptoms in their international student advises. However, research has shown that international students who have a positive relationship with their advisers are less likely to report stress-related issues [33].

To promote a more inclusive and effective advising approach for graduate international students, it is important to shift from an ethnocentric to an intercultural approach [38]. This approach recognizes and values the differences between cultures and draws on the strengths of both to support student development [38]. To achieve this, it is crucial to increase faculty's understanding and appreciation of both their own and their advisees' cultures. As such, further research should investigate the experiences of faculty in advising graduate international students [40] and explore how intercultural communication competence can impact the adviser-advise relationship. Acknowledging and respecting the unique cultural and academic backgrounds of international students is essential for creating an inclusive academic environment. Furthermore, future research could explore the ways in which international graduate students may be particularly susceptible to exploitation or mistreatment and investigate the role of effective advising and administration in identifying and addressing these issues to advocate for the wellbeing of this population. By implementing these changes, universities and faculty members can create a more supportive environment that benefits both faculty and students, fostering a deeper appreciation of diversity and enhancing the overall academic experience.

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