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Assessing Intercultural Competence in The Digital World: Evidence from Virtual Exchange Experience in a Study Abroad Program

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Abstract

This study presents evidence of the impact of an innovative pedagogical practice that cultivates and develops the intercultural competence of undergraduate college students. 15 U.S. undergraduate students enrolled in a business study abroad course and 12 Chinese undergraduate students participated in a virtual student exchange project in spring 2019. Using global distance learning technology, the students collaborated on the project to provide a joint comprehensive investment recommendation report. A comparison of U.S. students' Intercultural Effectiveness Scale scores at the beginning and end of the project revealed significant positive changes in their intercultural competence. Student self-evaluations and peer surveys confirmed improvement in students' global mindset. Being one of the first studies to demonstrate student intercultural competence and learning through a virtual exchange experience, this study provides implications for study abroad and virtual global learning.

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Introduction

Today's economy is increasingly competitive and globalized. In the workplace, employees interact with co-workers, customers, clients, or vendors from diverse cultures and countries. Membership in each of these groups will provide its own set of specific values, beliefs, and perspectives. Therefore, the ability to respect and understand diverse cultural contexts and viewpoints is an essential skill in the global work environment. As reported in a global research paper published by the British Council, intercultural skills are valued as highly as formal qualifications by employers surveyed in nine countries (British Council, 2013).

The education community also recognizes the importance of such skills. For example, the U.S. Department of Education developed a Framework for Developing Global and Cultural Competencies that begins in early childhood through postsecondary education. Likewise, the Association to Advance Collegiate Schools of Business (AACSB), a premier international accreditor for business schools, endorses a similar view. The Standards for Business Accreditation updated in 2020 include the ability to work in diverse and multicultural work environments as one of the general skill areas to be addressed in learning experiences at the bachelor's, master's, and doctoral levels (AACSB International, 2020).

In this study, we present evidence as to the impact of an innovative pedagogical practice on cultivating intercultural skills for college undergraduate students. Specifically, we designed and implemented a virtual exchange project in a study abroad course to enhance students' experiential learning. Quantitative evidence and survey results showed improvement in students' global mindset.

The current study contributes to literature in international education. First, our study is one of the first to provide clear evidence of student learning in a study abroad course that offers virtual exchange activities. O'Dowd (2021) has called for "blended mobility," a deliberate combination of physical mobility and virtual exchange (p. 212). Similarly, the European Commission reported on

the significant role for virtual exchange and online collaborative learning in the form of blended mobility in its new programs (European Commission, 2020). Our evidence demonstrates that virtual exchange, as a pedagogical approach, provides a program design to achieve learning outcomes in blended mobility programs. Virtual exchange is an effective intervention to enhance student learning in study abroad courses.

Second, the current project adds to a stream of studies that have assessed the role of virtual exchange for student intercultural learning. A literature review of major academic studies and impact reports on virtual exchange and intercultural learning outcomes is provided in the *Virtual Exchange* section of this article. We provide to the existing literature additional evidence by measuring and demonstrating the impact of virtual exchange experience on improving intercultural communication skills for undergraduate students at the course level. Our study implies that virtual exchange has the potential of contributing to global learning without the need for physical student mobility. Thus, we proffer that student learning and cultural competence can occur because of virtual exchange technology in non-study abroad courses as well as in study abroad programs.

In addition, we validated the use of an assessment tool of intercultural competence, the Intercultural Effectiveness Scale (IES). Moreover, quantitative results are confirmed by qualitative survey responses. Our program is a unique combination of virtual exchange and study abroad in a blended mobility course, which differs from prior studies. IES has been used to measure student learning in studies which assessed short-term study abroad programs (Nguyen, 2017; Richards & Doorenbos, 2016), and in studies that provided training of global skills in traditional classrooms (Feng, 2016; Gowindasamy, 2017; Relvea et al., 2013). Dunn-Jensen et al. (2021) assessed student learning in a whole semester glocal classroom which did not have a study abroad component. While these offerings included a robust set of activities and simulations for student learning, students in these programs had no virtual connections with foreign students. Our integration of virtual exchange in the blended mobility course is a simpler course design that is easier to implement to achieve similar learning outcomes.

The remainder of the paper is organized as follows. We provide background information including a brief introduction to intercultural competence and virtual exchange mechanisms. Additionally, we describe the

design and implementation of the project. Moreover, we will focus on the results and analysis of the data. Finally, we provide conclusions and suggestions.

Background

Intercultural Competence

In the highly regarded “Intercultural Knowledge and Competence VALUE Rubric” by the Association of American Colleges & Universities (AAC&U), “Intercultural Knowledge and Competence” is defined as “a set of cognitive, affective, and behavioral skills and characteristics that support effective and appropriate interaction in a variety of cultural contexts.” (AAC&U, 2010; Bennett, 2008) Generally, intercultural scholars agree that intercultural competence means “the ability to communicate effectively and appropriately in intercultural situations based on one’s intercultural knowledge, skills, and attitudes” (Deardorff, 2006, p. 247).

Furthermore, Deardorff (2006) developed a process model which incorporates various elements in intercultural competence as well as movement and process of acquiring the competence. The model, shown in Figure (1), demonstrates intercultural competence as a continual process of improvement.

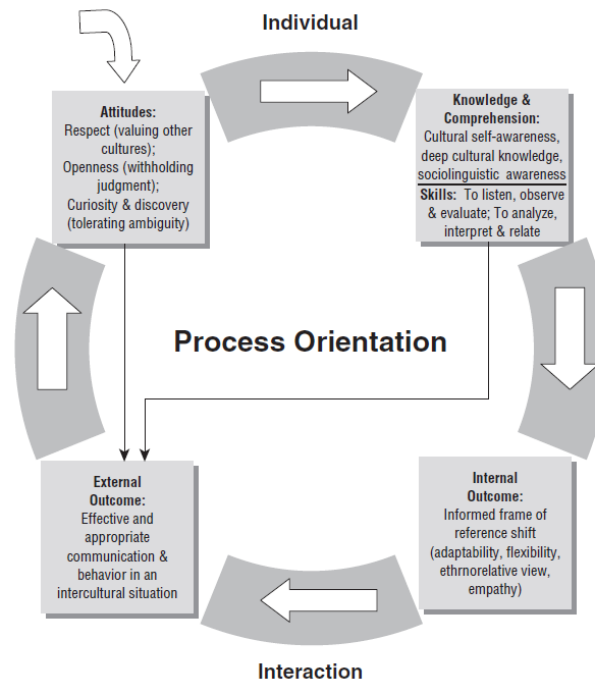


FIGURE (1): THE PROCESS MODEL FOR INTERCULTURAL COMPETENCE (DEARDORFF, 2006)

A variety of assessment tools have emerged to measure intercultural competence in quantitative terms. Among them, Intercultural Effectiveness Scale (IES) is described to assess “the degree to which students possess competencies that are critical to interacting effectively with people from other cultural backgrounds.” (The Kozai Group, 2011). The IES focuses on three dimensions of intercultural effectiveness: Continuous Learning, Interpersonal Engagement, and Hardiness. Each dimension is comprised of two scales: Continuous Learning (Self-Awareness and Exploration); Interpersonal Engagement (World Orientation and Relationship Interest); and Hardiness (Positive Regard and Resilience). Overall, the IES is in line with many items within the AAC&U Intercultural Knowledge and Competence VALUE Rubric.

Virtual Exchange

In recent years, virtual exchange has grown to become an innovative approach to provide opportunities for global learning on campus. The term “virtual exchange” was first defined as “technology-enabled, sustained, people-to-people education programs” by various learning management organizations, including Soliya, iEARN, and Global Nomads Group in 2011 (O’Dowd, 2021, p. 211). However, different models of virtual exchange, including Collaborative Online International Learning (COIL), Virtual Teams, E-tandem, Telecollaboration, Soliya, and Online Intercultural Exchange (OIE) have been used in settings that develop language learning, peacebuilding, and international cultural competencies (Zak, 2021).

In a virtual exchange course, instructors in different countries co-develop and share course content. Therefore, students in two or more countries engage in collaborative activities to complete assignments. Through interactions and communications via technology, students learn course content and gain intercultural skills in authentic and experiential learning. In addition to faculty members’ voluntary implementation of virtual exchange in individual courses, organizations such as the European Commission and the Stevens Initiative have run large-scale projects to engage youth in intercultural learning experience through a range of online activities.

A salient learning outcome of virtual exchange is intercultural competence. Case studies and impact reports have found positive results on participants developing intercultural competence during and after exchanges.¹

Custer and Tuominen (2017) leveraged an opportunity while one of them was on a Fulbright teaching appointment, in Japan, in 2014-2015. Students in a U.S. community college and women's universities in Japan participated in virtual exchange projects in the sociology discipline. The impact of the virtual exchange was assessed using pre- and post-surveys consisting of questions adapted from the General Student Form of the Global Perspectives Inventory (GPI) (Custer & Tuominen, 2017, p. 352). The authors did not find significant changes in most items for U.S. students because a high percentage of students already agreed with statements before participating in the exchange. However, results suggested that participation increased the value U.S. students place on interacting with people from different cultural backgrounds (Custer & Tuominen, 2017, p. 354). Responses to an open-ended question revealed that U.S. students gained a more sophisticated sense of cultural relativism through their interactions with Japanese students. The case study demonstrated a means to promote the campus learning outcome of developing a culturally relativistic perspective in an engaging way from the students' perspectives.

Li (2013) documented student experiences in a virtual exchange research project in spring 2011. Business students in the U.S. and China formed pairs to conduct comparative studies on different aspects of businesses in both countries. Li used his own version of measurement questions on the three-dimensional taxonomy to measure global attitudes, knowledge, and skills (Li, 2013, p. 134). Results showed that U.S. students significantly improved their global competence compared to a control group of students in the same AACSB-accredited American university. Results clearly confirmed that global competence is teachable by providing students with appropriate learning opportunities (Li, 2013, p. 138).

Bassani and Buchem (2019) conducted a virtual exchange project with participation from Germany, France, and Brazil to explore intercultural aspects through online collaboration. Data was collected and analyzed for the first

¹ Literature on virtual exchange has existed and continues to grow. For recent comprehensive review and critique on existing literature, please see O'Dowd (2021) and Zak (2021). The literature review in the current paper focuses on the assessment results of intercultural competence within the virtual exchange context.

edition of the project in 2016. A pre- and post-project online survey indicated that students felt more confident to work with people from other countries and that they made progress with intercultural skills (Bassani & Buchem, 2019, p. 33). In other words, perceptions related to cultural differences changed during the virtual exchange project.

Another large-scale virtual exchange project took place among 1221 MBA and graduate students from 17 universities in 12 countries in 4 consecutive years (2008-2011). Erez et al. (2013) documented the implementation of such Multicultural Team Project. Cultural Intelligence Scale were given to students at the beginning and the end of the project. Results demonstrated that both cultural intelligence and global identity significantly increased over time. More importantly, 6 months after the end of the project, levels of cultural intelligence and global identity remained stable for most project respondents (Erez et al. 2013, p. 345). The study provided strong evidence that virtual team projects enhance team members' global characteristics of global identity and cultural intelligence.

Like the virtual teams in Erez et al. (2013), Global Virtual Teams (GVTs) consisting of over 6,000 students from nearly 80 universities in 43 countries worked for about 2 months. Taras et al. (2013) investigated the impact of the project on student attitudes, learning, behaviors, and performance. Students' cultural intelligence was tested before and after they completed the project. Authors found that cultural intelligence rose significantly following the project. Moreover, students reported significant decreases in perceived intercultural differences and a positive adjustment in perceptions of collaboration (Taras et al., 2013, p. 425). Significantly, a majority of the students indicated they would change their behavior and handle the project differently for better performance.

The above studies also called for offering alternative global learning opportunities for American students especially those in community colleges (Custer & Tuominen, 2017; Li, 2013). Studies noted difficulties and challenges in implementing the project and improving intercultural competence among students. Challenging factors include language skills and cultural differences of modesty (Bassani & Buchem, 2019; Custer & Tuominen, 2017).

EVOLVE (Evidence-Validated Online Learning through Virtual Exchange) was funded as a Forward-Looking Cooperation Project under Erasmus+ Key Action 3: Support for policy reform, Priority 5 – Achieving the aims of the

renewed EU strategy for higher education by the European Education and Culture Executive Agency (EACEA). The EVOLVE project was conducted to mainstream virtual exchange as an innovative form of collaborative international learning across disciplines in Higher Education (HE) institutions in Europe and beyond. It ran from 1 January 2018 to 31 December 2020. The project team collected student data from 16 exchange projects between 34 partners from Higher Education Institutes in Europe and other parts of the globe and investigated 248 students' general perceptions and appreciation of virtual exchange and the development of intercultural competences among other skills (The EVOLVE Project Team, 2020, p. 13). The study used pre- and post-test surveys, student portfolios, and post-hoc interviews to general conclusions. The study found that: 1) students learn to develop the skills for successful intercultural interaction and the ability to manage and resolve conflicts which may occur; 2) that they acquire different aspects of cultural knowledge and learn to adapt to cultural perspectives and practices different from their own; and 3) that they develop a critical understanding of cultures, including reflection on their own perceptions and distancing from some of their worldviews. (The EVOLVE Project Team, 2020, p. 16).

Erasmus+ Virtual Exchange (EVE) is a pilot study on virtual exchange run by the European Commission. Implementing several models of virtual exchange, the EVE project utilized a key principle to use trained facilitators or educators in supporting learners to explicitly address intercultural issues and engage with difference (Helm & Van der Velden, 2021, p. 10). Over the implementation from 2018 to 2020, the project engaged 33, 541 youth participants and trained individuals exceeding the target of 25, 000 participants set by the European Commission. The project team adopted a mixed-methods approach including giving pre- and post-exchange questionnaires and conducting interviews and focus groups on a cross-national comparative research study. With respect to relevant intercultural competence, participants reported a statistically significant increase in self-esteem and improvement in feelings towards people with different backgrounds. Participants grew knowledge and/or interest in global events as well as understanding of the relationship between different societies and participants built meaningful relationships (Helm & Van der Velden, 2021, p. 11-12).

The Stevens Initiative is based in the United States and invests in virtual exchange programs between the U.S. and the Middle East and North Africa

(MENA). Its 2022 Virtual Exchange Impact and Learning Report highlighted the work of Initiative-funded programs from summer 2020 through spring 2021. The Initiative collaborated with RTI International on implementation of pre- and post-program surveys to 6,990 participants in virtual exchange programs (The Stevens Initiative, 2022, p. 3). The results showed statistically significant positive changes in multiple domains of global competencies. During the report period, participants overall reported large positive changes in knowledge of the other country of culture and moderate positive gains on the self-Other Overlap, as well as small gains in the Perspective Taking and Warm Feelings scales. Furthermore, small, or medium effects were detected in Cross-Cultural Communication and Cross-Cultural Collaboration (The Stevens Initiative, 2022, p. 8).

However, none of the studies included in the annotated list have examined the implementation of virtual exchange in study abroad programs. The limited number of studies and the narrow scope of research topics provides a fruitful area for future research.

Implementation of the Project

Purpose

The purpose of the present study was to explore the effect of implementing a virtual exchange project in a study abroad course on students' intercultural competence. Specifically, our study describes the design and process for the virtual exchange project and more importantly, investigates and assesses student gains from participation in the project. Following the definition of intercultural competence in Deardorff (2006), we focus on intercultural communication skills.

Project

The virtual exchange project was implemented in a study abroad course at a large state university in the U.S. during the spring of 2019. The course topic was doing business with China and introduced the students to the business environment and culture in China. Students met during periodic classes and completed assigned projects from January to April during the spring academic semester and thereafter, in May, travelled to China for 2 weeks of business and cultural visits to Beijing, Shanghai, and Shenzhen in China.

A U.S. finance professor helped draft the virtual exchange project, which was to create a simulated business scenario in which an investment firm's virtual team provided an investment recommendation for a U.S. client who was an expatriate in China.

The project required U.S. and Chinese students to study and work in assigned virtual teams to identify a U.S. stock in the client's portfolio and conduct a comparative analysis of a matching Chinese stock. The project included weekly assignments that led to a final report and a group presentation. Each weekly assignment asked virtual teams to submit a preliminary draft for part of the final report.

Participants

15 U.S. students enrolled in the study abroad course and 12 students enrolled in a university in China participated in the project. Five virtual teams were created, and each team included three U.S. students and two or three Chinese students. While U.S. students included a variety of business majors, Chinese students were all finance students in their junior year. Teams were carefully constructed so each team included a balance of gender and academic majors.

Integration with the Course

The virtual exchange project accounted for a large percentage of student grades in the U.S. study abroad course. The project was also part of a larger project requirement for Chinese students. Both courses used the same assignments in the project.

The project was deeply integrated with the study abroad course. During the visit to China, U.S. students would visit two Chinese stocks included in the project and the involved University in China. Virtual teams presented a comprehensive report while visiting The University in China. In addition, weekly assignments in the project matched with topics covered in the study abroad course.

The study abroad course embedded a variety of topics and material relevant to virtual team and intercultural communication. Virtual teams of students were assigned readings and videos. The students brainstormed about potential challenges and possible solutions to these challenges. Additionally,

throughout the course, guest speakers were invited to share their experiences with virtual teams in China.

Methodology

The present study focuses on student growth in intercultural competence after participation in the virtual exchange project. Deardorff (2011) suggested a combination of direct and indirect evidence be collected to assess intercultural competence, given its complexity. Therefore, we chose multiple assessment items to evaluate students' experience and perceptions.

E-portfolio is a digital format for students using multimedia to demonstrate their learning process and outcomes. It is one of the High-Impact Practices (HIPs) advocated by AAC&U. "E-portfolios provide a rich resource for both students and faculty to learn about achievement of important outcomes over time, make connections among disparate parts of the curriculum, gain insights leading to improvement, and develop identities as learners or as facilitators of learning." (Miller & Morgaine, 2009).

U.S. students developed personal learning goals at the beginning of the course and created e-portfolios at the end of the course to provide evidence on achieving learning goals. One of the required components of the e-portfolio is a reflection section on the virtual exchange project. The reflection prompts specifically asked students to suggest how they would apply learning from the project to issues in the local community or how their perspectives changed because of their participation.

We adopted IES as the quantitative survey instrument to assess overall intercultural competence. Among three dimensions of intercultural effectiveness: continuous learning, intercultural engagement, and hardiness, we were especially interested in student scores in the dimension of intercultural engagement given the nature of the project. This dimension evaluates students' interest in understanding people with other viewpoints and developing meaningful relationships with different people. It is comprised of two intercultural competencies: world orientation and relationship development. U.S. students took the IES twice: first at the beginning of the course and again when the project was concluded.

We also created a survey asking students to self-evaluate their improvement in intercultural competence in several areas. Survey questions

were based on Deardorff (2006). Chinese students were invited to complete a modified survey evaluating their perspectives on U.S. ley teammates' performance during the project. Both surveys were taken once at the end of the project.

Results and Analysis

Participant Demographics

For U.S. students, all except for one participant were traditional college students in their 20s and evenly divided by gender. They are predominantly Caucasian, and the others were one Hispanic and one South Asian. Only one student was an international student.

All the U.S. students were junior or senior undergraduate students. Table (1) Panel A shows participants represent most majors offered in the U.S. institute. Over a third of students were studying toward a finance degree or double majoring in accounting and finance. They were separated and placed in each of the five virtual exchange teams. Most students were participants in the Honors program and maintained an average GPA of 3.66.

Panel B shows students' international experience measured in a variety of ways. Six out of 14 students (43%) had taken a foreign language course but only two had taken a college course on foreign cultures. While only three students had participated in study abroad or exchange programs, 12 had travelled abroad for professional or personal purposes. Half of the participants reported someone in their family had extensive foreign travel/work/living experience. However, only two students had extensive contacts in a local international community.

Major	Number of students	Percentage of students
Accounting and Finance double-majors, or finance major	5	36%
Marketing	4	29%
Human resource management	3	21%
Business management	2	14%

TABLE (1): U.S. PARTICIPANTS' DEMOGRAPHIC DATA
 PANEL A - MAJORS OF PARTICIPANTS

International experience	Yes	No
Foreign language courses	6	8
Foreign culture courses	2	12
Prior study abroad or exchange experience	3	11
Prior foreign travel experience	12	2
Family history of foreign travel/work/live	7	7
Local international community	2	12

TABLE (1): U.S. PARTICIPANTS' DEMOGRAPHIC DATA
 PANEL B - INTERNATIONAL EXPERIENCE OF PARTICIPANTS

All participants agreed that the explicit mentioning of the virtual exchange project in the program recruitment material favorably impacted their decision to apply for the study abroad program. Moreover, all students believed they were somewhat knowledgeable or knowledgeable with a common definition of intercultural competence and related terms. Significantly, they all expected to improve intercultural competence after the virtual exchange project.

Students listed their top three concerns about the project. The number one concern was language difficulties. Students were nervous about the English language skill of their Chinese counterparts and wondered if the latter would understand slangs and idioms. Students were also worried about the time zone difference between U.S. and China and how the difference may affect communication schedule. Another common concern was teamwork effectiveness due to differences in learning and working styles from cultural background and social norms.

Quantitative Analysis – Overall IES Scores

Participants took the IES to assess their intercultural competence at the beginning and the end of the project. While the U.S. study abroad course consisted of 15 students, only 12 were included in the analysis since others missed the post-course IES survey. A nonparametric test, Wilcoxon Rank Sum Test, was used to assess the significance of differences between post- and pre-survey scores (Lehmann, 1998).

Table (2) summarizes pre- and post-project IES scores overall and their distribution. Data showed that the average overall score for U.S. students improved from 3.75 to 3.90 while standard deviation shrank from 0.32 to 0.28. Untabulated data indicated that all but two students improved their competency

scores. The highest score and the lowest score both increased in the post-project IES survey, so the entire group shifted from lower to higher scores. As a result, the more evenly distributed IES scores before the project were replaced by a concentration in the score range between 3.50 and 3.99. The low, moderate, or high category indicated each survey taker's relative position within a large sample comprised of a cross-section of tens of thousands of people who have already completed IES. At the aggregate level, all students had average competency compared to the sample group. A detailed analysis of individual movement revealed that four students moved from a lower category to a higher one.

Item	Pre-project IES	Post-project IES	Difference
Average	3.75	3.90	0.15
Standard deviation	0.32	0.28	0.04
Highest score	4.35	4.51	0.16
Lowest score	3.32	3.60	0.28
Scores in the range of 3.00-3.49	4	0	-4
Scores in the range of 3.50-3.99	5	8	3
Scores in the range of 4.00-4.49	3	3	0
Scores at or above 4.50	0	1	1
Low category	2	0	-2
Moderate category	7	8	1
High category	3	4	1

TABLE (2): SUMMARY OF PRE- AND POST-PROJECT IES SCORES

Quantitative Analysis –IES Dimensional Scores

Table (3) provides IES scores and standard deviations for three dimensions and each individual cultural competency. Wilcoxon Rank Sum Test results are indicated in the table. The score pattern and the achievements were uneven.

The dimension of **Continuous Learning** “examines how people cognitively approach cultural differences, and the degree to which individuals engage the world by continually seeking to understand themselves and also learn about the activities, behavior, and events that occur in the cross-cultural environment” (The Kozai Group, 2011, p. 2). U.S. students reached the highest overall scores consistently among three dimensions in both pre- and post-

project surveys. The average difference in scores (0.14) is significant at the 0.05 level.

Continuous Learning consists of two sub-dimensions: **Self-Awareness** and **Exploration**. Students had higher improvement in Self-Awareness than in Exploration and in addition, became significantly more interested in discovering individual strengths and weaknesses, and reflected more often on what they could learn from their experiences. Meanwhile, students were more curious and open to new ideas and experiences, even to the extent of actively seeking them out. However, the improvement in the Exploration sub-dimension is insignificant according to the test results. It is not surprising that students experienced higher Self-Awareness because they summarized and reflected in the virtual exchange project as part of the e-Portfolio reflection assignment.

Since U.S. students immersed in the virtual exchange project through connections and collaborations with foreign students for an extended period, we expected students to build relationships and improve intercultural communication skills. The Kozai Group (2011, p. 2) defines the dimension of **Interpersonal Engagement** as an assessment of “the degree to which individuals have the desire and willingness to initiate and maintain relationships with people from other cultural backgrounds”. As we expect, the group achieved the highest improvement (0.27) in the dimension of Interpersonal Engagement. This improvement is significant at the 0.05 level. U.S. students demonstrated strong and significant improvements in both **World Orientation** (formerly Global Mindset) and **Relationship Development**, two sub-dimensions of Interpersonal Engagement. Results suggest that students would exert more efforts to learn about other cultures and interact with people who do not share the same beliefs and values. Students believed in their willingness and ability to initiate and maintain relationships with people from other cultures or demographic groups. It appears that the month-long project expanded students’ global knowledge about people and other cultures and strengthened their global mindset. The significant improvement in Relationship Development likely came from close collaborations on the project with Chinese students, which initiated students’ interest to begin building and maintaining relationships with Chinese counterparts and even people from other cultures in general.

Interestingly, U.S. students achieved very little, if any, improvement in **Hardiness**, which assesses “the degree to which individuals are able to wait to

understand a situation or person versus the tendency to make snap judgments, which can produce anxiety and stress in cross-cultural relationships” (The Kozai Group, 2011, p. 2). Their positive attitudes toward people remained the same while they improved slightly in learning from failures and setbacks. Throughout the on-campus portion of the course, at the beginning of each class meeting, students informally discussed the progress of their projects and various challenges on working with foreign counterparts. Most of the time, the class brainstormed solutions to solving challenges. Therefore, students did not really experience significant failures and setbacks.

Dimension	Before		After		Difference
	Average	SD	Average	SD	
A. Continuous Learning	4.11	0.35	4.25	0.27	0.14**
A1. Self-Awareness	3.98	0.51	4.17	0.29	0.19*
A2. Exploration	4.24	0.30	4.33	0.33	0.09
B. Interpersonal Engagement	3.55	0.51	3.83	0.52	0.27**
B1. World Orientation	3.20	0.66	3.56	0.73	0.36**
B2. Relationship Development	3.91	0.58	4.09	0.42	0.19*
C. Hardiness	3.60	0.38	3.63	0.37	0.03
C1. Positive Regard	3.56	0.35	3.56	0.36	0.00
C2. Emotional Resilience	3.64	0.60	3.70	0.62	0.06
Overall	3.75	0.32	3.90	0.28	0.15*

** p<0.05

* p<0.10

TABLE (3): IES SCORES AND STANDARD DEVIATIONS BY DIMENSIONS

Overall, strong improvements in the dimension of Interpersonal Engagement drove the increase in overall IES score. Our results are largely in line with prior studies such as Dunn-Jensen et al. (2021) and Nguyen (2017). The study by Dunn-Jensen et al. (2021) reported a glocal classroom (GC) pedagogy that built and implemented intercultural effectiveness during the global COVID pandemic as an alternative to study abroad. Over the 15-weeks course, the GC pedagogy developed global skills via activities and simulations. They found significant improvement in all IES dimensions. More importantly, students without study abroad experience achieved similar results as students with prior international experience in the World Orientation and Relationship Development sub-dimensions in their post-test IES assessment. The findings suggest a carefully designed coherent system of activities and assessments in the GC can be effective methods for moving the needle on intercultural

competencies without a physical international experience.” (Dunn-Jensen, 2021, p. 221) Similarly, U.S. students in our study stayed local when collaborating on the virtual exchange project with foreign students. The project included components of assessments, self-awareness, receiving regular feedback, and reflection through e-Portfolio to improve intercultural competence. Our results are like the findings by Nguyen (2017) in that we both find significant upward movement in the overall IES score, in the Continuous Learning dimension and its Self-Awareness sub-dimension, and the Interpersonal Engagement dimension (both Global Mindset and Relationship Development sub-dimensions). Moreover, we did not observe significant change with respect to the Hardiness dimension. Nyugen (2017) noticed that significant improvement in Relationship Development (called Relationship Interest in her study) was likely due to several programs that offered meaningful opportunities allowing students to make international connections. This suggestion is consistent with the nature of virtual exchange in our study in which students connected via planned activities with foreign students.

Qualitative Analysis

In addition to the pre- and post-IES surveys, a post-experience questionnaire was distributed to students to garner their perceived changes in various areas of intercultural competence. Terms and descriptions used in the questionnaire were adapted from Deardorff (2006) Process Model of Intercultural Competence. Changes were coded as 1 (worse), 2 (no improvement), 3 (slight improvement), 4 (improved), and 5 (significant improvement). While U.S. students evaluated themselves, Shenzhen students evaluated American peers in their groups.

Table (4) presents average ratings of changes reported by U.S. and Chinese students. For U.S. students, they reported an improvement in all surveyed areas of intercultural competence. The most significant change came in their grasp of global issues, i.e., a global perspective for addressing current issues. This perceived improvement coincides with the highest improvement in the sub-dimension of World Orientation of the IES survey. U.S. students also believed they improved significantly in the areas of respect, adaptability, openness, cultural self-awareness, deep cultural knowledge, and empathy. However, students noticed only slight improvement in their abilities to listen, observe, and evaluate, abilities to analyze, interpret, and relate, and communication skills. It is possible that students did not have many

opportunities to develop these skills during the short duration of the collaborative project. In addition, instructors deemphasized the technical aspects while stressing about the cultural nature of the project.

Chinese students overwhelmingly reported significant changes made by their American peers. Their ratings were higher in all areas compared to self-evaluations by U.S. students. Moreover, Chinese students did not agree with U.S. students in terms of areas of biggest improvements. While U.S. students believed themselves improved the most in the global mindset, this was not observable with Chinese students who reported as the area with the least change. It is also possible that students did not exchange much about opinions on current issues due to media censorship in China. In contrast to U.S. students, Chinese students believed their peers exhibited significant changes in communication skills, analyzing skills, and listening skills. This is likely due to different curriculum and college course prep between U.S. and China.

Items	Self-evaluations by U.S. students	Peer evaluations by Chinese students
Respect (valuing and appreciating cultural diversity)	4.43	4.78
Openness (Initiating and developing interaction with culturally different others)	4.29	4.67
Cultural self-awareness (articulating insights into one's cultural rule and biases)	4.29	4.78
Deep cultural knowledge (compare and contrast home and host cultures)	4.14	4.33
Grasp of global issues (develop a global perspective for addressing current issues)	4.57	4.22
Listening, observing, evaluating using patience and perseverance	3.71	5.00
Analyzing, interpreting, relating comparatively and historically	3.43	4.56
Adaptability (expand boundaries of one's comfort zone, welcome and manage the unexpected)	4.43	4.56
Empathy (view world from other's perspectives)	4.00	4.78
Communication skills (verbal and nonverbal skills to achieve one's objectives)	3.43	4.67

TABLE (4): MEAN SCORES IN POST-EXPERIENCE QUESTIONNAIRE

Students were asked to provide examples to support their evaluations. It appears that Chinese students were more conscious about their language skills and therefore appreciated their American peer's patience when listening. The following are a few examples from Chinese students: I) "Although our

pronunciation is not very standard, American students will listen to us patiently and answer our questions friendly.” II) “She was patient when I was talking despite some grammar mistakes. I really appreciated that which made me relaxed.” III) “We feel that (name of a U.S. student omitted) always speaks a little slower to make sure that we all can follow.”

U.S. students’ comments highlighted how the project help identify their intercultural competence and broaden the world view:

I can understand why they are more wary of trusting other countries since they have been invaded as much as the U.S. in the last 100 or so years, and one of their main concerns is protecting their economic growth and development. I also had an interesting and long chat with (name of a Shenzhen student omitted) comparing our school systems. Our school systems have some similarities, but the differences are quite large. Especially in terms of college education, the pressure Chinese students face on their college entrance exam is huge and very impactful of their futures, but it was also crazy hearing how inexpensive college and room, and board is in China.

In evaluating my understanding of global issues and cultural understanding of China, I was surprised to learn that China has been invaded eight times since the nineteenth century, which has ultimately influenced how the country views the rest of the world. This information greatly impacted my understanding of the current trade war. For example, the United States believes China is taking too long to make decisions and progress through the negotiations process; however, since China has been invaded so many times and has experienced many negative interactions with the western world, it is not surprising that the country is slow to make decisions. It is simply looking out for its people.

Conclusions and Future Work

Our study demonstrates that students in a short-term study abroad course gained valuable intercultural competence by participating in a virtual exchange project. Their responses to the IES survey and self-evaluation demonstrates consistent results in improving the students’ global competency and an expanded world view.

The gain in intercultural competency skills is highly desirable by U.S. and China's employers and enhances career pathways and opportunities. A 2017 Institute of International Education (IIE) study explored the connection between study abroad programs and the development of enhanced skills that contribute to employment and career development. The study found study abroad has "an overall positive impact on the development of a wide range of 21st century skills" found in three domains developed by the National Academy of Sciences (National Research Council, 2012). The domains include: 1) cognitive competencies (skills related to cognitive processes and strategies, such as deep cultural knowledge and grasp of global issues; 2) intrapersonal competencies (intellectual openness, adaptability, cultural awareness, listening, observing, evaluating using patience, and empathy); and 3) interpersonal competencies (communication skills, teamwork, and leadership skills). The study data found that "study abroad participants can and do make positive gains in nearly all key skills desired for employment in today's workforce." (National Research Council, 2012) In addition, the IIE study revealed that most (78 percent) of the students surveyed discussed their study abroad experiences in their job interviews and while only a minority of them (27 percent) subsequently procured jobs that required international travel, students reported using the skills developed from study abroad in their current jobs.

Studies have also found that study abroad alone does not ensure development of intercultural competence (Behrnd & Porzelt, 2012). Recent research has investigated the effectiveness of intervention to enhance study abroad experiences. In an assessment study, Nguyen (2017) analyzed data for eight short-term study programs at three Texas institutions. Based on her findings, she recommended short-term programs use well-defined activities and assignments, incorporate meaningful local interaction, and provide planned re-entry. Vande Berg et al. (2009) investigated several program features for language learning and longer study abroad: duration, content coursework in the language of the host country, targeted language courses, mixed population of American and host country students, group mentoring, perceptions of a dissimilar culture, student housing, more time spent with host families or host nationals, and minimal time spent with American nationals. Among them, the use of a cultural mentor onsite was found related to gains in intercultural development (Vande Berg et al., 2009, p. 25).

Our blended study abroad program in which students immersed in a virtual exchange project before travelling has far-reaching implications for global learning in the current environment. Virtual exchange projects or modules provide student authentic and meaningful learning and experience to gain cultural intelligence. They can be added as course preparation before departure, be embedded as part of the course delivery, and be included for post-trip reentry. Virtual exchange experience provides support throughout the study abroad program.

Our evidence significantly demonstrates that a virtual exchange experience is an innovative and effective pedagogical practice for virtual global learning. Study abroad programs may not be accessible to students due to financial constraints, schedule conflicts, and travel restrictions because of the pandemic or wars. Instead, virtual exchange can be added to an existing course for intercultural related course objectives. Since virtual exchange experience leverages technology for student group work to achieve learning goals, student mobility is not required. It serves as an alternative strategy to compliment study abroad programs. For some campuses, it can be utilized as a strategy for internationalization at home.

Our study is one of the first to document the association between blended mobility courses and student intercultural learning. It also leaves ample room for improvement. While our study provides consistent evidence from assessment tools for intercultural learning, it does not show which activities in the virtual exchange project students have learned and improved skills. The understanding about the effect of virtual exchange on student learning would be enhanced if individual activities are assessed for student learning. Virtual exchange projects include synchronous and asynchronous components. Would learning outcomes, however, vary with different designs with synchronous and asynchronous communication activities?

Future studies can also assess how participants' background and prior experience impact their engagement and learning in virtual exchange projects. We ask for more studies for implementation of virtual exchange projects in different disciplines and with and without the study abroad component to fill gaps in knowledge about virtual exchange and student learning.

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