Without Crossing a Border: Exploring the Impact of Shifting Study Abroad Online on Students' Learning and Intercultural Competence Development during the COVID-19 Pandemic

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Abstract
While all higher education was affected by the COVID-19 pandemic, study abroad programs were uniquely challenged by the associated restrictions and limitations. This case study integrates a Collaborative Online International Learning (COIL) pedagogy approach and virtual reality (VR) technologies into the curriculum redesign process to transform a business study abroad course into an online format. Using VR technology, U.S. students and their international partners in Germany, Brazil, and India created and shared cultural exchange virtual tours. The redesigned online study abroad course engaged students in active learning activities and cultivated students' intercultural competence development.

Keywords: study abroad, COIL, virtual reality, intercultural competency, online transition, online readiness, motivation, online collaborative learning

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Without Crossing a Border: Exploring the Impact of Shifting Study Abroad Online on Students' Learning and Intercultural Competence Development during the COVID-19 Pandemic

Universities across the world have suspended their study abroad programs due to COVID-19. A recent study showed that 45% of prospective students would still be interested in studying abroad if the program was offered online during the pandemic (Svanholm, 2020). In this study, we described how two instructors from U.S. and Germany redesigned a traditional study abroad course to a fully online course and studied the impact of the online transition on students' learning and intercultural competence development through students' feedback and reflections.

Review of Relevant Literature

Study abroad programs aim to provide students with experiential learning: "the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 41). Through unique studying abroad experiences, students engage with intercultural learning activities and develop intercultural competence and academic knowledge and skills (McBride, 2020). In addition to the traditional study abroad approach, Collaborative Online International Learning (COIL) has been adopted in the last few years as an innovative and cost-effective pedagogical approach to offer students global learning opportunities "at home" (Vahed & Rodriguez, 2020; Nava-Aguirre et al., 2019). COIL courses aim to enhance student experiences for a regular course that otherwise would not include an international education component. COIL courses are co-developed and co-taught by the instructors from two countries and students usually participate in online collaborative group projects (Guth & Rubin, 2015). For instance, U.S. and Nigerian faculty designed a COIL-based interior design course to allow their students collaborate in various interior design project scenarios and solve design problems in a global social-cultural context (Asojo et al., 2019). Appiah-Kubi and Annan (2020) found that students in COIL courses performed better on the coursework compared to the students in the regular non-COIL course settings. However, there is little research about how to redesign a traditional study abroad course as a COIL course and how such online transition affects students.

As a general approach, COIL courses are designed around three primary elements: pedagogy, intercultural learning, and technology (Asojo et al., 2019; The SUNY Center for Collaborative Online International Learning, 2013, 2019). Successful technology integration can promote intercultural learning during study abroad (Lomicka & Ducate, 2019) and in COIL courses (Jie & Pearlman, 2018). Studies have shown that VR is an effective technology tool in enhancing students' learning experiences in intercultural communication (Li et al., 2020), language learning (Xie et al., 2019), and cultural tourism education (Chiao et al., 2018; Schott, 2017). For instance, study-abroad students' anxiety can be greatly reduced by visiting the host university through VR as a predeparture activity (Brunotte & Hastings, 2019). However, few studies have explored the impact of allowing students to create and share their own virtual reality artifacts for intercultural learning purposes, where students act as active VR content creators instead of passive VR experience receivers.

Methods

Context of the Study

Traditionally, about 50 U.S. business students from a large west coast public university will study alongside international engineering students from other partner universities for a two-week automotive engineering and business course at the Germany host university. The German public university specializes in technical and economic programs and provides talent to the top Germany luxury automobile manufacturers, such as BMW, Audi, and Mercedes. The U.S. and international partner universities mainly offered classes in traditional face-to-face settings. As the universities cancelled summer study abroad courses in March 2020, the U.S. instructor and the Germany instructor partnered to redesign the study-abroad course to a fully online COIL seminar course (Table 1).

First, the course was redesigned around new themes of Sustainable Innovation and Social Entrepreneurship, along with the two original learning objectives (LOs): (a) develop intercultural competence, and (b) work with people from different cultures and in different time zones. The third LO was changed from "develop business strategies for automobile companies" to "build and test tangible human-centered design ideas through rapid prototyping." These changes allowed students to conduct online research and develop innovative Social Enterprise Business Plan to address social, cultural, or environmental issues in different countries.

Second, an intercultural VR activity was created to encourage cultural exchange. Students were asked to (a) capture 360 images for virtual tour scenes; (b) use the Google Tour Creator (GTC) to create virtual tours about their own countries, cities, and institutions; (c) use Google Cardboards to view virtual tours; and (d) present their virtual tours to the class during a Friday happy hour on Zoom. The VR activity allowed students to exchange culture and get to know each other.

Third, both synchronous activities (e.g., live lectures, Zoom breakout room activity, student presentations, and guest speakers) and asynchronous activities (e.g., students' asynchronous group work) were offered each day. Two instructors jointly presented lectures and offered feedback to help students develop concepts and business prototypes. To accommodate different time zones, the international and U.S. students joined and left class at different times. The daily schedule ensured that students in the different time zones could participate in the same synchronous sessions together (Table 2).

Fourth, the online course fee was decreased dramatically to 30% of the original price. Still, the universities had difficulty recruiting students due to pandemic influence and decreased marketing budget. So, fewer students were recruited than expected.

Table 1

Comparison Between the Traditional Study-abroad Class and Redesigned COIL Course

	Traditional study abroad course	**Redesigned COIL course**
Topic	Automobile Engineering and Business	Sustainable Innovation and Social Entrepreneurship
Enrollment	50	16
Student Majors	Business (U.S.) Automobile Engineering (international)	Business (U.S.) Automobile Engineering (international)
Intercultural activity	In-person tours and experiences with designated student assistants, such as Discover Ingolstadt "by night"	Create and share virtual tours with GTC; Virtual tour presentation on Zoom
Student group activity	In-person	Online via Zoom breakout room, WhatsApp, Google Doc, Google Slides, and Trello
Business talks/tours	In-person at major factories and museums	Guest speaker presentation
Lecture/Guest speaker	In-person	Online via Zoom
Major assignment	Strategic Plan	Social Enterprise Business Plan
Time Zone	CEST	PST, CEST, and IST

Table 2

Example Daily Activity

International Students 15:30-20:30 (CEST)	U.S. Students 8:30-15:30 (PT)	Example Daily Activity (Week 2 Day 1)
15:30-17:00	NA	International Teamwork ● Prototyping
17:30-19:00	8:30-10:00	Guest speaker II (S) ● Business Planning
19:00-20:30	10:00-11:30	Lecture (S) ● Business Concept & Planning
NA	11:30	Wrap-up and next steps (S)
NA	12:00-15:30	U.S. Teamwork

Note: S = Synchronous Zoom session

Data Collection and Analysis

A mixed-methods research approach was adopted to provide a comprehensive view of students' learning experiences and perceptions of the COIL course. A 7-point Likert pre- and post-Intercultural Effectiveness Scale (IES) (Mendenhall et al., 2008) was used to measure students' intercultural competence development. To explore students' pre- and post-course perceptions, we adapted 5-point Likert scale items regarding students' online transition (Adnan & Anwar, 2020), online readiness (Watermeyer et al., 2020), motivation, and VR (Hauze et al., 2018). Additional post-survey questions gathered students' feedback on GTC, online collaboration (So & Brush, 2008), and course reflections. Semi-structured interviews were conducted with four student volunteers to explore their experiences and reflections in depth.

Sixteen junior-senior level students (age 18 to 44) participated in the redesigned COIL course. After data cleaning, 13 students' data were used for analysis with eight U.S. students and five international students (from Brazil, Germany, and India partner institutions). To assess pre-post changes for the 7-point IES scale, we report the mean and standard deviation for each pre-post item and use a paired *t*-test to evaluate the statistical significance of the change across time; however, because the 5-point perception survey items typically did not have a normal distribution, we report the median (Med) and inter-quartile range (IQR) and use the non-parametric Wilcoxon signed-rank test to evaluate the change across time. Students' interviews were analyzed using thematic content analysis (Clarke & Braun, 2014).

Results

Overall, students had a positive perception of their intercultural learning experiences in the COIL course. The study findings were discussed in light of the online transition and VR integrations' impacts and implications.

Online Transition

The survey and interview results showed that the students were satisfied with the COIL course design. Students appreciated short lectures and more interactive activities. Students believed the course offered "many opportunities to learn and engage and discuss and problem solve," "the course was very intellectual and eye opening to what the real world is like in other countries," and "it was very interesting, very, very fun." As shown in Table 3, the most interesting finding was that prior to the course, students were neutral regarding whether "a complete study-abroad course can be given online without difficulty" (median = 3), but by the end of the course, most students agreed with the statement (median = 4, a statistically significant increase).

Online Readiness

Overall, most students perceived themselves more "prepared" for online learning after the course (Table 3). Most students were confident in their technical and communication competency, which might be related to their previous online learning experiences. One student commented that "I've taken one online class each semester." The findings suggested that students perceived themselves as ready as they can be for online learning during the pandemic.

Motivation

Interviews indicated that students were motivated by personal interests in the course topics, intercultural communication opportunities, and especially instructor's personal encouragement and timely feedback. One student commented, "what motivated me during the class was the amount of feedback and interest that I received from the professor really made me feel like he was concerned about what I was learning and how I was doing." At the end of the course, students tended to disagree that face-to-face contact with instructors is necessary for their learning (Table 3), which might be related to the students' satisfaction with instructors' online presence. The findings suggested that instructors should establish personalized connections to motivate online learners.

Table 3

Students' Perceptions on the Online Transition and Online Readiness

Category	Items	Pre-Med (IQR)	Post-Med (IQR)
Online transition	I believe a complete study-abroad course can be given online without difficulty. *	3 (1)	4 (2)
	Face-to-face contact with the instructor is necessary for learning.	4 (1)	3 (2)
	Online learning is more motivating than in-person learning	2 (2)	2 (1)
	I feel that I can improve my intercultural competence skills through online courses with foreign professors and students.	4 (2)	5 (1)
	As a result of my experience with this course, I would like to take another distance course in the future.	NA	4 (2)
Online readiness	I can access appropriate technologies to support my online learning.	5 (1)	5 (0)
	I am comfortable communicating electronically. *	5 (1)	5 (0)
	I feel prepared to have study abroad class in online format. *	4 (0)	5 (1)
	I have confidence in learning Social Entrepreneurship topics online. *	4 (1)	5 (0)

Note: Med = Median, IQR = Inter-quartile range (IQR). Students' perceptions ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). * Pre-post comparison significant at $p < 0.05$.

Intercultural Competence

Overall, students tended to strongly agree that they can improve intercultural competence skills through online interactions with international partners (Table 3). One student commented:

> Online study abroad experience influence my intercultural competence development quite a bit. Not only I get exposed to other cultures and working internationally, but also doing the IES assessment helped me look at areas that I was lacking in from my own perspectives.

As shown in Table 4, statistically significant higher tendencies were observed in students' post-IES results, which suggested that COIL course enhanced students' intercultural competence development.

Table 4

Students' Self-reported Intercultural Competence

Category	Pre-M (SD)	Post-M (SD)
Continuous Learning *	4.25 (.37)	4.44 (.36)
Exploration	4.46 (.35)	4.49 (.42)
Self-Awareness *	4.03 (.45)	4.39 (.39)
Interpersonal Engagement *	3.59 (.54)	3.88 (.70)
Relationship Development *	3.90(.71)	4.15 (.90)
World Orientation *	3.29 (.50)	3.60 (.68)
Hardiness *	3.31 (.68)	3.69 (.80)
Positive Regard	3.33 (.79)	3.57 (.94)
Emotional Resilience *	3.28 (.79)	3.82 (.74)
Overall IES *	3.72 (.43)	4.00 (.56)

Note: M = Mean, SD = Standard Deviation. Students' self-reported scale ranged from 1 (low) to 7 (high). * Pre-post comparison significant at $p < 0.05$.

Online Collaborative Learning

The results in Table 5 revealed students' satisfaction with their online collaborative learning experiences across cultures and time zones. Students perceived themselves to have engaged in active collaborative learning with peers, developed skills and knowledge, and produced a sense of community. Students discussed and adopted various technologies to facilitate their group's online communication and collaboration, including Zoom, WhatsApp, Google Docs, Google Slides, and Trello. Some students became frustrated with intercultural group communication and collaboration challenges. One student commented:

> Working with international teams showed me again how important time-zoning for work can be. Also, that communication is kind of difficult, if nobody is in "charge" and pushes other team members.

Students suggested the instructors to: (a) designate students' roles (e.g., a leader); (b) require at least one synchronous off-class group meeting; (c) encourage students to accommodate different time zones for off-class communications; (d) offer in-class time to let group members connect and debrief "as getting the entire team to agree or discuss was usually dealt with right before class"; and (e) provide intercultural communication training.

Table 5

Students' Perceptions on Collaborative Learning

Items	Post-Med (IQR)
I actively exchanged my ideas with group members.	5 (0)
I felt part of a learning community in my group.	5 (1)
I was able to develop problem solving skills through peer collaboration.	5 (1)
I was able to develop new skills and knowledge from other members in my group.	5 (1)
Collaborative learning in my group was effective.	4 (1)
Overall, I am satisfied with my collaborative learning experience in this course.	4 (1)
Collaborative learning in my group was time consuming.	3 (1)

Note: Med = Median, IQR = Inter-quartile range. Students' perceptions ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

Virtual Reality

The survey and interviews indicated that students enjoyed creating and sharing virtual tours using GTC, which helped them improve intercultural competence skills (Table 6). One student commented that "It was interesting to learn about other countries in a format that is more interactive and engaging." Some groups organized their design ideas in Google Doc and then one member took the lead in GTC. Due to the pandemic, most students did not get to capture 360-degree photos outside. Students integrated audio narration and hotspots in Google Street View panorama to showcase the well-known historical or cultural landmarks (Figure 1), places that are meaningful to themselves (e.g., where they study or work; see Figure 2), or the traditional study-abroad tour stops, such as Audi forum museum (Figure 3). Students and instructors were excited to find interesting details in common, such as "Hausboot (Houseboat). . . another German word that has been adopted by the English language." Students also exchanged their thoughts on the new gym facilities spotted on the U.S. campus and discussed how education budgets were spent

differently in other countries. The students appreciated VR's affordances and wanted more meaningful course-related VR activities, such as Germany automobile factories' virtual tours. Overall, students agreed that the GTC is easy to use and is a good learning tool. But students would prefer a collaborative VR platform to support groups' collaborative creation.

Table 6

Students' Perceptions towards Virtual Reality and Google Tour Creator

Category	Items	Pre-Med (IQR)	Post-Med (IQR)
Virtual Reality	I am interested in learning through virtual reality.	4 (1)	4 (1)
	I enjoy learning through virtual reality.	3 (0)	4 (1)
	Learning through virtual reality increases my motivation in online courses.	3 (1)	3 (1)
	I find that learning through virtual reality very motivating.	3 (1)	3 (2)
Google Tour Creator	Viewing other country groups' virtual tours helped me improve my intercultural competence skills online.	NA	5 (1)
	Sharing virtual tour motivates me to conduct intercultural exchange virtually.	NA	4 (1)
	Google Tour Creator is easy to use.	NA	4 (2)
	Google Tour Creator is a good learning tool.	NA	4 (1)
	Using Google Tour Creator in cultural exchange activity motivates me to learn online.	NA	4 (1)

Note: Med = Median, IQR = Inter-quartile range. Students' self-reporting ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

Figure 1.

Screenshot of "Independence Hall" scene in the U.S. students' virtual tour.

Figure 2.

Screenshot of one international student's Germany virtual tour.

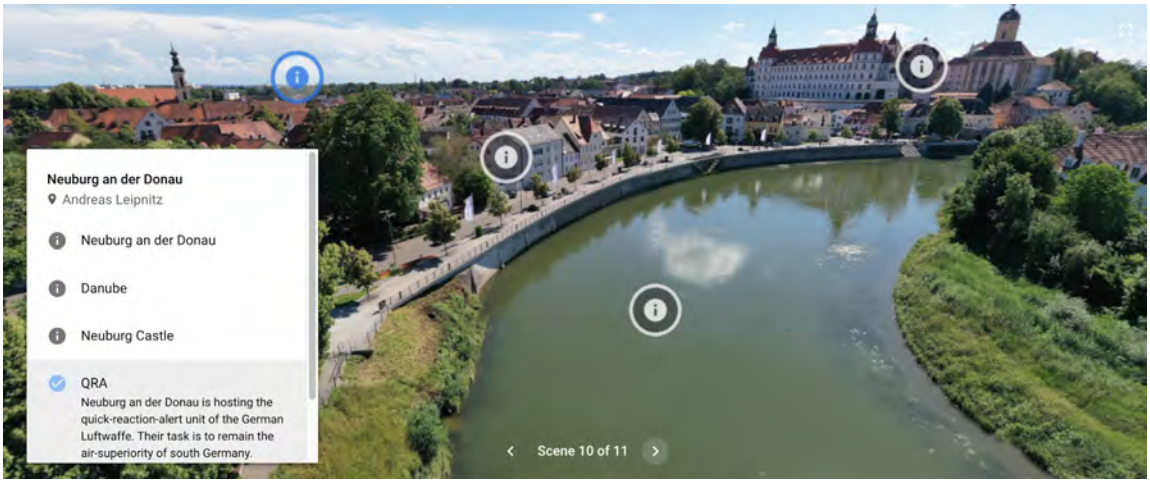

Figure 3.

Screenshot of "Audi Forum" scene in one international student's virtual tour.

Conclusion

Overall, students were satisfied with the redesigned online study-abroad course, which suggests that traditional study-abroad courses can be redesigned into fully online COIL courses. VR cultural exchange is a successful substitute during COVID-19 pandemic, but VR cannot replace a full immersion in a different country. In addition, students demand more meaningful and subject-related web VR learning activities integrated into the course. Future study-abroad courses should consider flipped online course design to include short lectures leaving more time for student-student and student-instructor interactions. Online course schedule and student communication should accommodate different time zones. More training and scaffolding are needed to facilitate the students' intercultural online collaboration. After the pandemic, a hybrid model could also be adopted to enrich students' in-person study-abroad experience along with COIL-based online course components.

Reference

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, *2*(1), 45–51.

Appiah-Kubi, P., & Annan, E. (2020). A review of a collaborative online international learning. *International Journal of Engineering Pedagogy*, *10*(1), 109–124.

Asojo, A., Kartoshkina, Y., Jaiyeoba, B., & Amole, D. (2019). Multicultural learning and experiences in design through Collaborative Online International Learning (COIL) framework. *Journal of Teaching and Learning with Technology*, *8*(1), 5–16.

Chiao, H. M., Chen, Y. L., & Huang, W. H. (2018). Examining the usability of an online virtual tour-guiding platform for cultural tourism education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *23*, 29–38.

Clarke, V., & Braun, V. (2014). Thematic analysis. In A. C. Michalos (Ed.), Encyclopaedia of quality of life and well-being research (pp. 6626–6628). Springer.

De Castro, A.B, Dyba, N., Cortez, E. D., & Pe Benito, G. G. (2019). Collaborative online international learning to prepare students for multicultural work environments. *Nurse Educator*, *44*(4), E1–E5.

Guth, S., & Rubin, J. (2015). Collaborative online international learning: An emerging format for internationalizing curricula. In A. Schultheis Moore & S. Simon (Eds.), *Globally Networked Teaching in the Humanities* (pp. 83–99). Routledge.

Hauze, S., Hoyt, H., Marshall, J., Frazee, J., & Greiner, P. (2018). An evaluation of nursing student motivation to learn through holographic mixed reality simulation. In *2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE)* (pp. 1058–1063). IEEE.

Jie, Z., & Pearlman, A. M. G. (2018). Expanding access to international education through technology enhanced Collaborative Online International Learning (COIL) courses. *International Journal of Technology in Teaching and Learning*, *14*(1), 1–11.

Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.

Li, C., Ip, H. H., Wong, Y. M., & Lam, W. S. (2020). An empirical study on using virtual reality for enhancing the youth's intercultural sensitivity in Hong Kong. *Journal of Computer Assisted* Learning, *36*, 625– 635.

Lomicka, L., & Ducate, L. (2019). Using technology, reflection, and noticing to promote intercultural learning during short-term study abroad. *Computer Assisted Language Learning*, 1–31.

McBride, K. (2020). Experiential learning and education abroad: Examining the experiences of students in the semester abroad and intercultural leadership program. In *Diverse Pedagogical Approaches to Experiential Learning* (pp. 241–257). Palgrave Macmillan, Cham.

Mendenhall, M., Stevens, M. J., Bird, A., Oddou, G. R., & Osland, J. (2008). Specification of the content domain of the intercultural effectiveness scale. *The Kozai Monograph Series*, *1*(2), 1–22.

Nava-Aguirre, K. M., Garcia-Portillo, B. I., & Lopez-Morales, J. S. (2019). Collaborative Online International Learning (COIL): An innovative strategy for experiential learning and internationalization at home. In *The Palgrave Handbook of Learning and Teaching International Business and Management* (pp. 721–746). Palgrave Macmillan, Cham.

Schott, C. (2017). Virtual fieldtrips and climate change education for tourism students. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *21*, 13–22.

Svanholm, A.G. (2020). *The impact of COVID-19 on study abroad: Latest survey results*. Education.com. https://institutions.educations.com/insights/student-survey-covid-19-and-study-abroad

The SUNY Center for Collaborative Online International Learning. (2019). *Guide for collaborative online international learning course development*. http://www.ufic.ufl.edu/UAP/Forms/COIL_guide.pdf

The SUNY Center for Collaborative Online International Learning. (2013). *The COIL institute for globally networked learning in the humanities final report.* http://coil.suny.edu/sites/default/files/case_study_report.pdf

Vahed, A., & Rodriguez, K. (2020). Enriching students' engaged learning experiences through the collaborative online international learning project. *Innovations in Education and Teaching International*, 1–10.

Watermeyer, R., Crick, T., Knight, C., & Goodall, J. (2020). COVID-19 and digital disruption in UK universities: Afflictions and affordances of emergency online migration. *Higher Education*, 1–19.

Xie, Y., Ryder, L., & Chen, Y. (2019). Using interactive virtual reality tools in an advanced Chinese language class: A case study. *TechTrends*, *63*(3), 251–259.