

MOOC Teaching Assistants' Global-engaged Learning in the United States and China

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Abstract

How can we create a “global-at-home” learning experience for university students to engage them in serving global professional communities online? This study applied global engagement surveys alongside interviews and focus groups in online contexts to examine engaged learning outcomes of U.S. and Chinese university students who served as MOOC teaching assistants for course participants from over 50 countries. Findings from pre and post surveys showed that TAs significantly increased their scores on efficacy, political voice, conscious consumption and critical reflection. Further, qualitative analysis showed that TAs worked to adapt their language in communication with course participants, a key aspect of intercultural competence, and that they gained self-efficacy in online communication and in their ability to make a difference. TAs described affordances of online global-engaged learning, including accessibility, time for reflection, lack of implicit bias, creating long-term connections, and reaching large audiences. They also reflected on challenges, including lack of emotional connection, lack of response from participants, language barriers, and perceived lack of expertise. This study offers recommendations for designing online learning and community engagement experiences that can provide opportunities for university students to gain intercultural competence, efficacy, and reflection skills.

Keywords: global engagement, online learning, MOOCs, intercultural competence, civic engagement, cultural differences

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Introduction

Online learning is increasingly seen as a means to internationalize the curriculum (Jung & Gunawardena, 2023), engage students in service-learning (Froehlich, 2023; Strait & Nordyke, 2015), and foster the development of essential skills for contemporary workplaces, such as intercultural communication and collaboration (Lewis & O'Dowd, 2016; Liu & Shirley, 2021). Notably, Massive Open Online Courses (MOOCs) stand out for providing unique global online learning opportunities, enabling participants from various countries to exchange perspectives (Sparke, 2017). Paralleling the expansion of online learning are calls for equitable forms of global engagement, citizenship, and learning, acknowledging that not every student has the opportunity to study abroad or engage in service-learning overseas (Di Pietro, 2020).

Global engagement integrates intercultural competence, civic skills, and critical thinking (Hartman et al., 2015), whereas global learning is defined as “a critical analysis of and an engagement with complex, interdependent global systems and legacies (such as natural, physical, social, cultural, economic, and political) and their implications for people’s lives and the earth’s sustainability” (Hovland, 2014). Researchers have assessed the impact of study abroad and other university global engagement programs using the Global Engagement Survey, which integrates intercultural competence and civic learning (Gendle & Tapler, 2022; Reynolds et al., 2016), and by analyzing student video narratives (Tarchi et al., 2019). As we become more aware of the potential and perils of online learning and community engagement, the need arises to adapt tools used for researching in-person global experiences to examining “global-at-home” learning and community engagement (Hovland, 2009; Krasny et al., 2021).

To address this need, we engaged university students in serving as teaching assistants (TAs) for a series of MOOCs and explored their global engagement skills before and after their TA experiences. We purposefully chose student TAs from the MOOC host university in the United States and from China given that one-third of the MOOC participants were Chinese. Our MOOCs have a strong focus on discussion and project-based learning. They have been described as ‘courses for a cause’ (Krasny et al., 2020) in that participants must complete project plans or actual projects in which they conduct environmental education, environmental stewardship, or climate action activities in their local communities. While recognizing the potential for global engagement skills, such as intercultural competence, to increase among MOOC participants (Mathews & Landorf, 2016), in this study we focused more narrowly on university student MOOC TAs. This is consistent with past use of the Global Engagement Survey with university students. It also helps us understand online engagement experiences of university students, which is an area of interest given restraints on travel due to covid, and financial and environmental or climate concerns associated with study abroad and global service-learning. To broaden the lessons learned from our work, we also focused on the affordances and challenges of global engagement online.

Literature Review

Because MOOCs have generated controversy as a context for learning, we first provide a brief overview of cultural issues inherent to MOOCs. We then provide an overview of global learning and engagement and its assessment, including “global-at-home” experiences.

MOOCs and Culture

Since being first introduced in 2008, MOOCs have evolved with different platforms, formats and learning models. MOOCs exploded in 2012 with the emergence of three major providers in the United States: Coursera, edX and Udacity, followed by Futurelearn in Europe, XuetangX in China, and other regional providers around the world (Ruipérez-Valiente et al., 2022). MOOCs focused on credentials (Laryea et al., 2021) and were integrated with traditional education, allowing university students to earn credits through MOOCs (Griffiths et al., 2015; Moore, 2022). Due to the COVID-19 pandemic, MOOCs regained attention and experienced another phase of explosive growth (Shah, 2020). The most popular learning model is content-based (xMOOCs). Other approaches include network-based models focusing on connective learning (cMOOCs, Bai & Xiao, 2023; Yeager et al., 2013), and social learning (slMOOC) (Jitpaisarnwattana et al., 2021; Krasny et al., 2018), which blend xMOOC and cMOOCs (Anders, 2015).

Although MOOCs provide accessibility and enable sharing diverse viewpoints across the globe (Brinton et al., 2014), they also pose numerous challenges to learners with various cultural backgrounds. For example, MOOCs have been criticized as imposing Western values, content, and pedagogy on global audiences (Jung & Gunawardena, 2023) who often struggle with language, content, and engagement during the courses (Phan, 2018). MOOC research has shown that participants' cultural backgrounds influence their learning performance (Liu et al., 2016) and has explored ways to enhance achievement for participants from developing countries who may feel out of place in courses with highly educated Western participants (Kizilcec et al., 2017). Instructional strategies such as including transcripts and translation, offering live sessions, providing mentors or teaching assistants (Phan, 2018), using social media to facilitate discussions (Ruby et al., 2015; Zheng et al., 2016), scaffolding assignments (Quintana & Aguinaga, 2022), and facilitating study groups (Krasny et al., 2018) could help address global learner's needs. In addition, interventions such as goal-setting (Handoko et al., 2019; Wong et al., 2021), plan-making and value-relevance (Kizilcec et al., 2020), learning analytics dashboard (Davis et al., 2017), or social norms messages (Cho et al., 2021) could enhance global learners' engagement during the course and increase completion rates.

MOOC research has also shown the importance of having TAs in enhancing the learning experience of global learners. Wadams and Schick-Makaroff (2022) summarized MOOC TAs' roles including motivator, coach, communicator and facilitator. For example, TAs can create humorous introductory quizzes to engage participants (Oakley et al., 2016), translate course content into different languages, and monitor the discussions (Phan, 2018). Ntourmas et al. (2018) pointed out that the TA responsibilities could vary depending on subjects and cautioned that TAs could act more as "omniscient interlocutors" rather than as facilitators of knowledge acquisition (Ntourmas et al., 2019). Previous studies have focused on TAs' roles and responsibilities. However, we are not aware of any research that examines how the MOOC TAs themselves are impacted by assisting global learners.

Global Learning and Engagement

Hartman et al. (2015) proposed a model for global learning that incorporates intercultural capacities, critical thinking, and global citizenship. The model integrates various approaches to

service-learning and community engagement, as well as study abroad and related experiences to prepare students for living in a globalized world.

Research on study abroad and international service-learning experiences has focused on how students develop intercultural and related competences. Intercultural competence involves effectively and appropriately navigating interactions between individuals who have different or divergent emotional, cognitive, and behavioral perspectives on the world (Spitzberg & Changnon, 2009). Based on extensive interviews with university administrators and faculty leading study abroad programs, Deardorff (2006) outlined a series of attitudes (respect, openness, curiosity), knowledge (e.g., cultural self-awareness), and skills (listening, observing, interpreting, analyzing, evaluating and relating) that comprise intercultural competence. In defining competences inherent to global learning, Hovland (2014) states that students should aim to be well-informed, open-minded, and responsible, paying attention to diversity in all its forms. They should strive to understand the impact of their actions on both local and global communities and engage in collaborative and equitable efforts to tackle the world's most critical and persistent challenges.

Study abroad and service-learning experiences leading to such competences generally entail several weeks to several months of immersion in a foreign culture. Students immersed in another culture may experience "critical incidents" involving a misunderstanding or conflict due to cultural differences (Tarchi et al., 2019), or "cultural wonderment" that involves seeking out new experiences and a willingness to deal with resulting discomfort (Engberg et al., 2016). Similarly, students engaged in service-learning may experience dissonance, or the stage of transformational learning where their prior perspectives clash with aspects of their service-learning experience (Kiely, 2005). To process such disorienting experiences, students engage in reflection generally guided by a mentor or professor; such guided reflection is the most consistent predictor of student outcomes in service-learning (Eyler, 2011). Reflection may be analytic and logical or a critical critique of hegemonic discourse and power, both of which can be considered a form of critical thinking (Kiely, 2015).

In addition to intercultural competence and critical thinking, global citizenship is a component of global engagement. As universities internationalize their curriculum, they incorporate global citizenship efforts that vary in approach from neoliberal, to radical, to transformationalist (Shultz, 2007). Common across programs to foster global citizenship is an emphasis on social justice/human rights and self-reflection, which helps students understand unequal global power dynamics, reflect on their own place in the global world, and ultimately address social injustice (Aktas et al., 2017).

Global-at-home

Recent social trends challenge the idea that global learning can only be achieved through abroad or international experiences. Green (2018) suggests that universities can take advantage of the increasing cultural diversity of their students to provide opportunities for global learning on campus. Logistics, such as time, money, and family commitments, and ethical concerns regarding fossil fuel consumption of air travel, may also limit students' enthusiasm for study or service-learning abroad. At the same time, internet technologies including online course platforms, web conferencing, and social media make possible cross-campus and campus-

community partnerships that span geographic location. Furthermore, the COVID-19 pandemic accelerated the adoption of online formats. Chinese students in online study-abroad and exchange programs improved their English skills and intercultural competence through online interactions with international partners, although they experienced challenges of communication due to time differences (Liu & Shirley, 2021; Ren & Zhou, 2024).

“Global-at-home” engagement can occur in a variety of contexts (Hovland, 2009). Strait and Nordyke (2015) describe multiple models of eService-Learning, including distributed students working with local communities and communicating with each other and the instructor online, and co-located students who work with communities remotely. Tu and McIsaac (2023) have proposed the term “global digital citizen” to describe a learner who is able to “create, share, and network knowledge with the use of digital tools” (p. 108). During and after the COVID-19 pandemic, eService-Learning provided an alternative for students to stay engaged with local and global communities (Faulconer, 2021; Veyvoda & Cleave, 2020). Studies reported that eService-Learning brought rich multicultural online exchanges for students (Yu et al., 2023), improved youth development and leadership attributes (Culcasi et al., 2022; Shek et al., 2022), and facilitated student pro-social justice and civic attitudes (Ahmad & Gul, 2023). However, major challenges include communication barriers due to time differences and technology, and a lack of interpersonal engagement (Khatani et al., 2023).

Assessing Global Learning and Engagement

Whereas close-ended pre/post surveys have been used to measure student gains in intercultural competence and related outcomes, such measures depend on students' initial competence levels and fail to capture the richness of the student experience. Thus, Deardorff (2006) calls for using multiple assessment methods including interviews, case studies and other qualitative measures in assessing intercultural competence. Tarchi et al. (2019) analyzed student video narratives discussing a “critical incident” in their abroad experience to assess development of intercultural competence.

The Global Engagement Survey integrates theory and outcomes from intercultural and civic learning, as well as critical reflection, which is foundational to both types of learning (Hartman et al., 2015; Reynolds et al., 2016). The Global Engagement Survey has been used with students engaged in a diversity of study abroad and service-learning experiences at multiple universities (Ferrarini et al., 2022; Reynolds et al., 2018). For example, Gendle and Tapler (2022) found that as a result of a multi-year community-based global learning program, undergraduate students showed higher scores on the civic efficacy subscale of the Global Engagement Survey.

In this paper, we used the Global Engagement Survey alongside semi-structured interviews and focus groups, and analysis of TA journals and blogs to explore global learning among U.S. and Chinese TAs for multiple MOOCs focused on climate and environmental education. We decided to focus on TAs rather than MOOC participants because we were interested in how a more intensive “global-at-home” experience would impact global engagement among university students. Studying both U.S. and Chinese TAs helps us understand how university student TAs experienced global-engaged learning through MOOCs in different cultural contexts. Because of different training and tasks for these two groups of TAs,

the intent of this study was not to compare the global engagement skills between them. The results help us understand the global engagement outcomes of one type of global-at-home experience and shed light more broadly on the use of TAs in MOOCs and other global online learning environments. Specifically, we addressed the following research questions:

- (1) What changes in intercultural competence, civic engagement, and critical reflection do U.S. and Chinese MOOC TAs demonstrate?
- (2) What are the affordances and challenges of global engagement online experienced by U.S. and Chinese MOOC TAs?

Methods

Context

A large university in North America offered a series of MOOCs on the edX Edge platform, covering climate and environmental education topics. Each MOOC lasted four to five weeks and included videos, readings, weekly discussion assignments and a final project. Upon completion, participants earned non-credit course certificates. Each course offering attracted 500 to 2,000 participants from over 50 countries. The most highly represented countries were China, the U.S., Canada, Nigeria, the Philippines, and Iran. The authors on this paper served as instructors for the courses and coordinated the TAs. With support of the TAs, we made MOOCs accessible to participants from different countries and pedagogical traditions, with limited internet access, and who speak different languages. For example, to assist non-English speaking participants, we provided English, Spanish, and Chinese captions for the video lectures, and supported course-participant-led study groups for other languages. To foster interactions among participants globally, we offered live sessions via Zoom and used social media tools such as Facebook, WhatsApp, Telegram and WeChat. The study was approved by the University Institutional Review Board.

Participants

We recruited a total of 68 TAs (60 females and 8 males, 44 undergraduates and 24 graduates) including 19 U.S. TAs studying at the MOOC host university (15 females and 4 males, 17 undergraduate students and 2 graduate students) and 49 Chinese TAs (45 females and 4 males, 27 undergraduate students and 22 graduate students). Among Chinese TAs, 40 were studying at universities in China and 9 were studying at universities in other countries (e.g., the United States, Canada, Denmark, Germany, Switzerland) when they joined the TA program. During each of the four semesters from Fall 2017 to Spring 2019, the TAs assisted with 2–3 MOOCs. A total of 40 TAs (15 U.S. and 25 Chinese) served for only one semester, 19 TAs (3 U.S. and 16 Chinese) served for two semesters, 6 TAs (1 U.S. and 5 Chinese) served for three semesters, and 3 Chinese TAs served for four semesters.

The U.S. TAs enrolled in an independent study for 1–3 credits and developed a learning plan with the second author, who served as the TA coordinator. Their main responsibilities were to facilitate course Facebook groups and discussion forums on edX Edge. TAs received training in transmedia techniques and cultural competence in international and online environments. U.S.

TAs completed digital media projects including course-content related comics, websites, story maps, blogs, and Zoom presentations. TAs receiving 3 credits were given opportunities to start small MOOC participant groups based on language or interest, and one TA took charge of a course email account to respond to participant questions. U.S. TAs met weekly for an hour with the second author to discuss their experiences and engage in training activities. The first author joined these meetings several times a semester.

Chinese TAs focused on assisting Chinese participants via WeChat and had limited interactions with international participants on edX Edge or through Zoom webinars. They helped with translating course materials and organized weekly roundtable discussions in the WeChat course group for Chinese participants. They also facilitated 11 local study groups at the city or provincial level ranging from 20 to 100 participants each. Most TAs organized online discussions via WeChat for the local study groups, and 4 TAs organized in-person meetings for the local study groups in Beijing and Guangzhou. Chinese TAs also initiated special interest groups and invited course participants to join the small groups for a semester-long project focusing on topics such as recycling or green schools. Chinese TAs met weekly for an hour with the first author or the head TA to discuss their experiences.

Data Collection

Global Engagement Survey

The Global Engagement Survey (Reynolds et al., 2016) was developed based on established surveys such as the International Volunteering Impacts Survey (Lough et al., 2009), Global Citizenship Scale (Morais & Ogden, 2011), and Global Perspective Inventory (Braskamp et al., 2014). It seeks to examine university students' global engagement through global service (Hartman & Kiely, 2014) and study abroad (Paige et al., 2009). In adapting the Global Engagement Survey to our context, we sought to measure MOOC TAs' engaged learning outcomes related to three categories: intercultural competence (communication and self-awareness), civic engagement (efficacy, political voice, conscious consumption and values) and critical reflection (Table 1). We implemented the Global Engagement Survey before and after the TA program each semester. In the post survey, we also included open-ended questions asking about TAs' rewarding and challenging experiences, and suggestions for future TAs. Because 28 TAs served for more than one semester and completed the survey more than once, only their first pre survey (response rate: 91.1%) and post survey responses (response rate: 89.7%) were used for analysis.

Cronbach Alpha for each of the global engagement scales in this study ranged from 0.64 to 0.91, indicating acceptable to good reliability. Content and construct validity were ensured by using an existing instrument developed by experts and validated in previous studies.

Table 1
Global Engaged Learning Outcome Definitions

Global Engaged Learning Outcome	Definition	Survey item example
Intercultural		

competence

Communication	One's comfort with and interest in learning from and interacting across various forms of cultural difference.	I am very comfortable talking about diversity with people of different cultures.
Self-awareness	One's awareness of oneself as a cultural being, working to adapt behaviors appropriately for varying cultural contexts.	I adapt my behavior and mannerisms when I am interacting with people of other cultures.

Civic Engagement

Efficacy	One's comfort and confidence in respect to one's own capacity to make meaningful civic contributions, locally and internationally.	I know how to develop a plan to help address an environmental or social problem.
Political voice	One's intentions to use one's civic voice.	Over the next 6 months, I will contact media to express my concerns about an international problem.
Conscious consumption	One's professed intentionality regarding the use of one's own economic resources to advance just outcomes through consumer practices.	If at all possible, I will always buy fair-trade or locally grown products and brands.
Values	One's belief in shared human dignity, as expressed through global sense of community membership and civic identity. One's belief in fundamental human dignity, coupled with governments' responsibility to promote and protect that dignity through human rights.	I feel a responsibility to people in need globally.

Critical reflection

	Engaging in a learning process that recognizes and critiques ideology (political, economic, social and cultural), uncovers hegemonic assumptions, and examines relations of power with the goal of becoming critically aware of how each distorts our worldview.	I think a lot about the influence that society has on other people.
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Note. In the later version of the global engagement survey (Reynolds, 2018), several terms were replaced without changing the survey items. Intercultural competence was replaced by cultural humility, communication was replaced by openness to diversity, civic engagement was replaced by global citizenship, efficacy was replaced by civic efficacy, and values were replaced by global civic value and human rights beliefs. In this manuscript, we continue to use the original terms we employed for survey and interview protocol development.

Interviews

The first author conducted 30-minute individual, semi-structured interviews with U.S. TAs about their TA experiences in-person at the end of each semester, which resulted in a total of 21 interviews with 17 TAs (1 TA was interviewed three times and 2 TAs were interviewed twice). Given many Chinese TAs couldn't meet in person for interviews, the author conducted three one-hour focus group interviews via Zoom with Chinese TAs at the end of the second, third and fourth semesters, which resulted in a total of 9 focus group interviews with 5–6 TAs in each group.

Journals, Blogs, and Open-Ended Survey Questions

In Fall 2017 and Spring and Fall 2018, U.S. TAs completed weekly journal entries with guided prompts that asked them to reflect on what went well, what challenges they faced, any suggestions they had, and how they had connected with participants and each other. A total of 15 Chinese TAs in the first semester also completed journal entries. During the fourth semester, U.S. TAs completed 5 private blog posts shared only with the instructor and 1 public blog post shared with MOOC participants. In the private blog posts, TAs described their weekly activities, reflected on readings or training materials and how they had applied them in practice, and wrote about their favorite post of the week from a participant.

Data Analysis

Survey Analysis

From the Global Engagement Survey, we coded TAs' responses on a scale of 1–5 (1: Strongly disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Strongly agree). We used linear mixed-effects models to determine if any changes in global engagement might be related to the TA program. Through these models, we examined the global engaged learning outcomes with a random intercept of student TAs and fixed effect of time of survey (pre versus post), controlling for TAs' demographics including gender and their grade level (undergraduate or graduate).

Interview and Journal/Blog Analysis

Authors conducted two rounds of coding in Dedoose. Their first round of coding incorporated both structural codes (Saldaña, 2021) based on the Global Engagement Survey scales, which had informed interview questions, as well as emergent concepts uncovered in interviews, journal entries, and blog posts. The first and second authors met regularly during this preliminary coding process to go over new codes developed and ensure they agreed on definitions and applications. During the second round of coding, the authors evaluated redundant codes and began sifting codes into broader categories through a focused coding process (Lofland

et al., 2022). Finally, the first and second authors exported codes and associated quotations to an excel spreadsheet to examine code frequencies and evaluate dominant themes in the data. The first author coded all the Chinese focus group interviews and survey responses using the same coding process, and translated the quotes selected in the results section.

Results

Following their TA experience, MOOC TAs from the U.S. and China significantly increased their scores on Global Engagement Survey constructs related to civic engagement and critical reflection but not intercultural competence. Further, qualitative analysis showed that TAs worked to adapt their language in their communication with participants, a key aspect of intercultural competence, and that they gained self-efficacy in online communication and in their ability to make a difference in environmental problems and education.

Quantitative Results

After controlling for gender and grade level (undergraduate vs. graduate), the MOOC TAs (Chinese and U.S. TAs combined) significantly increased their scores on three of the four civic engagement items (efficacy ($p < 0.01$), political voice ($p < 0.1$), conscious consumption ($p < 0.01$)) and on critical reflection ($p < 0.01$), but not on the intercultural competence items, from the pre survey to the post survey (Table 2).

U.S. TAs reported a marginally significant increase in scores on efficacy ($p < 0.1$) and critical reflection ($p < 0.1$), and Chinese TAs reported a significant increase in scores on efficacy ($p < 0.05$), conscious consumption ($p < 0.05$) and critical reflection ($p < 0.05$).

Table 2

Estimated Marginal Means from Linear Mixed-effects Models

Global Learning Outcome	Total N = 67		United States N = 19		China N = 48	
	Pre	Post	Pre	Post	Pre	Post
Intercultural competence						
Communication	4.18	4.21	4.37	4.36	4.09	4.13
Self-awareness	3.90	3.92	4.16	4.16	3.77	3.80
Civic Engagement						
Efficacy	3.79 ***	3.95 ***	3.90 *	4.09 *	3.73 **	3.88 **

Political voice	3.32 *	3.47 *	3.24	3.46	3.36	3.49
Conscious consumption	3.74 ***	3.92 ***	3.68	3.82	3.77**	3.96 **
Values	4.15	4.21	4.25	4.32	4.09	4.15
Critical reflection	3.92 ***	4.11 ***	4.07 *	4.31 *	3.84 **	4.01 **

Note. *** $p < 0.01$ ** $p < 0.05$. * $p < 0.1$

Qualitative Results

While the survey results do not demonstrate a significant increase in intercultural communication among TAs from either China or the United States, our qualitative data suggest that TAs strove to adapt their language in their communication with MOOC participants, a key aspect of intercultural competence and that they gained confidence in online communication and in their ability to make a difference. TAs liked the flexibility of online learning but were frustrated by a perceived lack of emotional connection and the challenges of getting participants to respond to their discussion questions and comments both on the course platform and on social media. In this section, we highlight these dominant themes that emerged during our coding.

Intercultural competence

In interviews and open-ended survey responses, U.S. TAs described how they had learned about environmental issues from international perspectives and had been able to step outside of their “western” views and consider environmental problems such as land management and environmental education from non-western perspectives (Table 3). U.S. TAs considered international perspectives in responding to international MOOC participants’ posts on social media and in discussion forums. They adapted their language, taking care to avoid idioms and to investigate participants’ cultural contexts prior to responding. Although efficacy is not a specific component of intercultural competence in the Global Engagement Survey, in our qualitative results, we found that if TAs felt successful in communicating with diverse audiences, they perceived an increased ability (efficacy) to engage online.

Chinese TAs did not exhibit as much reflection related to intercultural competence compared to U.S. TAs; only one Chinese TA reported that an important thing she learned was that people from different backgrounds and cultures were participating in environmental activities. Chinese TAs focused more on their challenges and successes with language and communication, describing how they gained self-efficacy in communicating during webinars and gained language skills for communication as they translated and summarized course materials in Chinese.

Table 3
Intercultural Competence Sub-themes and Examples

Intercultural competence	Example quotations
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Understanding issues from international perspectives, appreciates diversity	<p><i>I gained a lot from this interaction in terms of not only learning about the environmental conditions, policies and concerns in different geographic and cultural contexts, but also feeding off of the many creative ideas and action plans that participants shared in their final projects (U.S. TA).</i></p> <p><i>An important thing I learned is that there are so many participants with different backgrounds and experiences either taking part in environmental activities or organizing them (Chinese TA).</i></p>
Adapting Language	<p><i>The cultural competency training has definitely reminded me to refrain from using figures of speech or idioms and that the students have diverse goals and perspectives (U.S. TA).</i></p> <p><i>There are some cultural differences, I need to understand some background information in order to conduct discussions (Chinese TA).</i></p>
Language skill building for communication	<p><i>As a TA in that course, I mainly did a webinar summary. I felt that it was quite an exercise for me, because I forced myself to listen in a systematic manner, and then to summarize it later...I also tested my general summary ability. So I think I learned a lot (Chinese TA).</i></p>
Communication confidence	<p><i>[MOOC TA] really helped me...And also making my communication more effective, especially in the learning and online setting (U.S. TA).</i></p> <p><i>And may be a little more confident. For example, to help with a webinar, I feel that sometimes some points are too simple, and everyone may know that. I understand it, but I dare not say it. Later I found out that I could just say it as it is, and I feel more confident (Chinese TA).</i></p>

Civic Engagement

In addition to an increase in self-efficacy in intercultural communication described in a previous section, we found that TAs enhanced their belief that they could make a difference, take environmental action, and communicate effectively online even if they weren't subject experts in the course topics (Table 4).

Self-efficacy develops in part through social modeling (Bandura, 1977), and we saw this with TAs who gained inspiration from being immersed in discussions with participants from around the globe who were taking environmental action in different contexts. A TA who had found it difficult to reconcile the global scale of environmental problems with the abstract discussions in her classes found inspiration in reading about the environmental education work being done globally. Related to their teaching and communication capacities, U.S. TAs reflected on their ability to provide emotional support and to make a difference as part of the course participant network. TAs also gained self-efficacy related to environmental actions and behaviors. Notably, several Chinese TAs mentioned how this experience helped their university environmental clubs in conducting environmental education projects.

TAs had some difficulty interpreting the meaning of "global citizenship" during the interviews but reflected on their role in the broader world and how they contribute to global systems. For example, they recognized that, as consumers of products from all around the world,

they participate in a global system and can make conscious choices about how they interact with that system. Other TAs reflected on their consumption choices as a result of interacting with international participants who were working toward the same goals, such as reducing use of single use plastics or eating plant rich diets.

Table 4

Civic Engagement Sub-themes and Examples

Civic Engagement	Example quotations
Inspiration	<i>I went through a period of doubt a little bit this semester. Talking about [educating people about the environment] on a global scale in a classroom is so different from interacting with people who actually do it on maybe a smaller local scale... it's definitely a bigger impact that they're having than ten-minute discussions that we have in class. I really enjoyed... course participants were able to share about the differences that they're actually making and want to continue making (U.S. TA).</i>
Self-efficacy: Making a difference as a TA	<i>I can help in terms of providing resources or giving, I mean even just emotional support, like that's real (U.S. TA). I felt like the online experience is very enriching and that I did make a difference. I didn't know how we will be able to, you know, facilitate meaningful contact online and was a bit skeptical at first (U.S. TA).</i>
Self-Efficacy: Making a difference through environmental action	<i>After returning to our club, we implemented our projects. During this summer, we will have a team to conduct an environmental education project in a middle school (Chinese TA). But I think through this program I realized that by interacting with all these passionate people who are really concerned about the environment makes you realize that together all the little things that we do have a larger impact (U.S. TA).</i>
Global Civic Value	<i>Any consumptive behavior that I do is...a mark on the land and any amount of money that I spend is a vote for something. And then anything that I'm talking about is influencing democracy at large. And then that influences policy in my country and that influences the policy in other countries. So absolutely global citizen (U.S. TA). I feel in the vast sea of people as if I have a particularly slim role in globalization... If you focus on some of the regional environmental problems, you can participate in investigating or solving the environmental problems...but you will feel very helpless about the kind of environmental problems of globalization (Chinese TA).</i>
Conscious Consumption	<i>Watching so many people work on reducing the use of single waste products definitely put more pressure on me to do the same thing, even though that's something that I think I was trying to do before... Having seen so many people do it around me definitely kept it in my head a little more (U.S. TA). He was talking about coffee and the impact of climate change on coffee, I found it particularly interesting... it is actually produced globally, and then it is related to many people and many things, so it is not just a way of consumption. In fact,</i>

there will be a lot of things behind it, including some exploitation, and everything may exist, so I can feel it from that course (Chinese TA).

Critical Reflection

The process of engaging with international participants online and exposure to course materials promoted critical reflection among U.S. TAs (Table 5). While participating in the *Urban Environmental Education* MOOC, a TA realized that she had never considered urban nature as nature and wrote a blog about urban nature in all the cities in which she had lived. Another TA realized he had never considered conservation from other points of view before, and he began questioning his own approaches to conservation. TAs also recognized that they had ample resources as students and yet there were people in the courses with many fewer material resources who were seeking connections and working toward gaining knowledge and resources from other course members. Critical reflection was coded only a handful of times in Chinese focus groups, but one TA noted differences in Chinese participants' understanding of environmental issues and mentioned that perhaps this is due to not having experience in international settings before.

Table 5

Critical Reflection Examples

Theme	Example quotations
Critical reflection	<p><i>I sort of had this view of nature where I didn't really think of urban nature as actually being nature at all...But in a lot of the world that's not as true, especially in cities where a growing percentage of the world lives (U.S. TA).</i></p> <p><i>I thought conservation was this and this is why it's important and everyone knows this kind of thing. And then taking a step back and seeing here are the different philosophies towards conservation. And questioning, maybe, do I believe in that...? (U.S. TA)</i></p> <p><i>Especially as a student, I have so many resources I can easily go to, but you see some people here who don't really have that many resources, but still, you see them trying to get help from all these other participants. And you really see those connections form (U.S. TA).</i></p> <p><i>I think that foreign participants have a broader understanding of this topic than Chinese participants. It seems that many people consider international angles, but I always feel that Chinese participants seem to tell their own stories, lack of a large perspective on climate change environmental problems from multi-angles, such as policy, economy, society and impact, may just simply from the environmental point of view (Chinese TA).</i></p>

Online Affordances and Online Challenges

MOOC TAs reflected on both the affordances and the challenges of online courses. In interviews and journal entries, U.S. TAs spoke about affordances for learning that reflected the purposeful, instructional design of the MOOCs and asynchronous online learning more generally (Table 6). MOOCs have been heralded for their capacity to democratize and make learning more accessible, and U.S. TAs noted this feature of the courses as well as the large scale of the

courses. U.S. TAs mentioned that the asynchronous nature of the discussion boards meant that participants had time for in-depth reflections. Interestingly, although U.S. TAs explained that they carefully considered participants' culture and background when responding to them, they also discussed how online environments may diminish implicit bias, since they were less able to judge participants by physical appearance and characteristics. Chinese TAs mentioned that webinars and discussion boards enabled Chinese participants to communicate with international participants, and WeChat course groups allowed them to interact with each other and even form collaborative relationships.

Both U.S. and Chinese TAs described their challenges with the lack of emotional connection they felt with participants and with the difficulties of engaging in deep conversation online (Table 7). A lack of response to TA posts from MOOC participants was the most commonly coded challenge for both groups. Chinese TAs faced additional challenges translating the course readings and webinars into Chinese. Both groups described feeling like they might not be able to help course participants because they lacked expertise in the course topic.

Table 6
Online Affordances Sub-themes and Examples

Online Affordances	Example quotations
Accessibility	<i>I can easily, this is accessible... I think that's one dynamic of it where it's people who are very motivated are getting involved in this (U.S. TA).</i>
Time for Reflection	<i>But I think online you can better think out what you want to say. So instead of saying a couple of sentences at a time people would post whole paragraphs at a time, and respond with other paragraphs, so it can be more in depth (U.S. TA).</i>
Lack of implicit bias	<i>I feel like with online there is less judgment or less bias because you see someone's thought versus how they appear physically (U.S. TA).</i>
Creating long-term connections	<i>Beyond simply being heard and solidifying knowledge and values through writing, people can also bounce ideas off each other or be inspired by posts that others make--especially those about action and first steps. It seems like it could also open opportunities for connections that last beyond the course, since many of the participants are like-minded or are involved in similar organizations (U.S. TA).</i> <i>I think for the service-learning you have a specific goal in mind where you're going to build this or build that and you're going to help the community in this way. Whereas, I think for online learning it's definitely more long term (U.S. TA).</i>
Reach large audience	<i>I got to interact with a lot of people that I wouldn't have interacted with like in any other setting. I'm not going to [be able to] visit these countries and talk with these people, especially on something that I'm passionate about like on environmental issues (U.S. TA).</i> <i>It's really an excellent way to have a meeting and talk about the formal and non-formal EE experience in English in Zoom and WeChat (Chinese TA).</i>

Table 7
Online Challenges Sub-themes and Examples

Online Challenges	Example quotations
Lack of emotional connection	<i>I think in person it's harder to ignore the issue because it's right in front of you...But online there may still be photos or videos, but it's like oh that's online that's far away...I feel like an emotional connection in person... (U.S. TA).</i>
Lack of response from participants	<i>I continue to comment on participants' posts, but I do not expect a response. It can be frustrating as a TA because this requires putting in hours of work each week and not getting rewarded for it in terms of responses from participants (U.S. TA). The discussion in the study group I led didn't seem to be very interactive. I tried to lead reading discussions to foster more discussions in that group. But it didn't seem to be effective (Chinese TA).</i>
Translating course materials into Chinese	<i>I feel that the reading summary is quite a challenge for me. Because every week there are more than twenty pages of pdf documents. Then they have to be summarized into one or two slides. So I had to read it for a long time every time before I summarized it on one slide (Chinese TA).</i>
Lack of Expertise	<i>Because I didn't actually take the course before, I have a feeling that I may be a TA without enough relevant knowledge. I don't know how to communicate with participants. I only added a few participants as friends in the WeChat group, but I haven't talked more deeply with them (Chinese TA). I found it a bit intimidating to introduce myself on [Facebook] since I didn't have even a fraction of the experience that many of our students have (U.S. TA).</i>

Discussion

This study sought to understand whether “global-at-home” (online) experiences might lead to the intended outcomes of international service learning experiences conducted abroad, including intercultural understanding, civic engagement, and critical reflection (Hartman et al., 2015). U.S. and Chinese TAs reported significantly higher levels of civic engagement and critical reflection after their MOOC TA experiences. The increase in civic engagement aligns with the findings of a previous study that also used the Global Engagement Survey to assess students' growth in civic efficacy as a result of a multi-year community-based global learning program with both online and in-person components (Gendle & Tapler, 2022). Whereas our survey results indicated no significant changes in intercultural understanding among TAs, the U.S. and Chinese TAs did describe gaining intercultural awareness in interviews and focus groups. These results are similar to those of a study of in-person global learning programs across 11 different institutions, which showed significant improvements among students in just two of the eight Global Engagement Survey subscales—intercultural communication and civic efficacy—but in interviews demonstrated changes in students' views about conscious consumption (Reynolds et al., 2018). Similarly, U.S. students who studied abroad in Denmark showed no significant differences between pre- and post-test Global Engagement Survey scores, but qualitative data revealed critical reflection and personal growth, particularly a sense of efficacy in their ability to make a difference (Vandermaas-Peeler et al., 2018). Although one may

have expected that the lack of emotional connection with MOOC participants reported by TAs would limit the outcomes of their international experience relative to students who have the time and resources to move to another country for an extended period, our results are similar to those of studies of in-person experiences.

Analysis of interviews, blogs, journals, and open-ended survey responses suggests that U.S. TAs gained efficacy in their ability to communicate with people from different backgrounds using online text and in their ability to make a difference both as TAs and through environmental action. Gains in communication efficacy may reflect the fact that TAs' primary duties involved attempting to spur conversation in online forums as well as the outsized importance of written communication in online settings as opposed to in-person settings. While U.S. TAs were not learning new languages, the international audience in the Facebook and WhatsApp groups required them to think critically about how they communicated ideas. Chinese TAs were practicing a second language (English) and gained communication skills through interacting with international participants during webinars and through facilitating discussions among Chinese participants in WeChat groups. Both of these experiences may have facilitated the development of pragmatic competence (Blattner & Fiori, 2009), or a knowledge of appropriate language use in specific contexts.

The TAs' reports of feeling emotionally disconnected from participants highlights one of the key challenges of online engaged learning, particularly at the scale of a MOOC (Khiatani et al., 2023). Feelings of disconnection could also have been due to the relatively unstructured role of the TAs (Ntourmas et al., 2019). Their duties focused heavily on fostering discussion on the course and social media platforms, yet MOOC participants often did not respond to the TAs' prompts and did not engage in back-and-forth discussions. Studies of MOOC participants have revealed the existence of emotional affordances, or structures by which MOOCs elicit emotions, both negative and positive, and that such affordances can play an important role in motivating students (Cheng, 2014; Park et al., 2019). For example, Cheng (2014) describes how students in a Python programming MOOC gradually expressed more positive, achievement related emotions that became more salient as students worked together on programming problems in the discussions.

In contrast to these MOOC programming students, most of the interactions between the TAs and the course participants in our study focused on communication and discussion rather than collaboration. As such, the TAs (and course participants) were part of a MOOC "broadcast network" in which members' posts are readable by all other members (Aviv et al., 2008) but not all members contribute or reciprocate (Wasko & Faraj, 2005). Even if several TAs mentioned that networking with course participants was a rewarding experience, how strong and how long this networking activity extends beyond the course is unclear. Although several TAs did express being inspired by the environmental stewardship activities of our MOOC participants from countries around the world, whether they commonly experience the "cultural wonderment" of study abroad students placed in uncomfortable, new situations is unclear (Engberg et al., 2016). Given the importance of project-based and team learning, and the ability of MOOC project assignments to be adapted to local contexts (Krasny et al., 2020), future TA programs could consider a mixed approach that enables TAs to combine communications and discussions with the entire group of MOOC participants with collaborative projects with a small number of MOOC partners.

The study showed that the Global Engagement Survey could be a moderately effective quantitative tool to assess students' global learning. The non-significant changes in the sub-scales might be due to ceiling effects, which were also observed in previous studies (Gendle & Tapler, 2022; Vandermaas-Peeler et al., 2018). Our MOOC TAs, who were self-selected into the program, were highly motivated to interact with a global audience and might already possess a high level of competency in global engagement. Additionally, they had very little experience with online intercultural communication and could have overrated themselves in the pre-survey due to a lack of familiarity with the challenges but provided a more accurate assessment in the post-survey. Qualitative methods such as interviews, focus groups, blogs, and journals used in our study can offer a more nuanced understanding of TAs' experiences.

The study also supports the potential importance of TAs in addressing MOOC participants' needs (Phan, 2018). Serving as communicators and facilitators (Wadams & Schick-Makaroff, 2022), our MOOC TAs were mindful of their communication with participants from diverse cultural backgrounds, in addition to focusing on content facilitation (Ntourmas et al., 2019). While many MOOCs employ TAs, research about the impact and roles of those TAs remains "poorly articulated" (Wadams & Schick-Makaroff, 2022). This research serves as a model for others interested in delving further into the myriad ways in which TAs may support and learn from MOOCs.

Limitations

This study has some key limitations. First, the small sample size and lack of a control group limited the type and scope of statistical analyses we were able to perform. Social desirability is another potential limitation, as TAs self-reported any changes and may have sought to express results they knew the researchers—with whom they had worked throughout the semester—wanted to hear. The data were collected before the COVID-19 pandemic, during which TAs may have vastly increased their experience with online learning platforms. But while the pandemic upended in-person learning, MOOCs maintained their typical structure and modes of interaction (i.e., via textual interactions on discussion boards) (e.g., Zhu et al., 2023). As such, this study offers valuable insights into the extent to which and the mechanisms through which TAs gain intercultural competence and, in particular, communication efficacy.

Conclusion

MOOC TA programs afford opportunities for students to enhance some global engagement skills, without the costs (expense, greenhouse emissions, family separation, interruption of academic classes) associated with travel. This is particularly important as we search for ways to design online learning and community engagement experiences that can afford opportunities for gaining intercultural competence, efficacy, and reflection as has been reported for in-person engagement experiences. We caution against the tendency to consider online experiences as second-best to in-person experiences but instead urge educators to consider how "global-at-home" experiences can afford novel opportunities for student growth. For example, MOOC TAs have the unique opportunity to interact with participants from multiple developed and developing countries. Such trans-global experiences are not possible through semester-long study abroad or shorter immersion experiences during university breaks. One

possible way forward for online engaged learning is to create opportunities for collaborative projects with a small number of remote participants, thus fostering the emotional connections that motivate students to become engaged globally.

Disclosure statement

No potential conflict of interest was reported by the authors.

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