MY WATER, MY CHANGE: CONFRONTING GLOBAL WATER CONCERNS THROUGH CROSS-CULTURAL COLLABORATION

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Abstract

Water is vital to life; this is a simple fact, but human behaviors and relationships with water are increasingly complex. Designers at the undergraduate level should learn to confront the complexities of water scarcity and conservation, as well as how to discuss, explore and design for these issues in a global context. In response to this need, two design educators fused visual communication, international relations, and two geographically distinct graphic design courses to address the theme of water sustainability. Through an ongoing series of cross-cultural virtual collaborations between classrooms located in the Middle East and North America, students created interactive and experiential solutions to understand the ecological centrality and social importance of water. Students learned to work within teams to create new tools, approaches, and communication interventions with the goals of raising community awareness, educating, and/or changing behaviors regarding water use. As a product of the collaboration, exhibitions of the student projects in Doha, Qatar and Rochester, New York, USA delivered the poignant message that, regardless of a country's existing resources, drastic changes are needed to respond to the water crisis in a timely manner. This research contributes to a growing dialogue on the future of water across the globe, while advocating for increased opportunities for cross-cultural collaboration in the design classroom. The curriculum developed by the two lead faculty and its resulting design outcomes are presented to encourage continued creative innovation for environmental stewardship—an imperative that extends past the borders of region, country, or nation.

Keywords: *Water, Sustainability, Cross-Cultural, Virtual, Collaboration.*

Introduction

As global sustainability concerns become intertwined with the design field in professional practice and curriculum development, the need to engage in these issues through the lens of intercultural relations becomes increasingly important. Successful design solutions should carefully consider the culture and context of the intended audience while communicating across a spectrum of communities. The benefits of intercultural partnerships—such as sensitivity to other cultures and expanded problem-solving capabilities (Wang 2011:243)—can, therefore, become a productive component of design interventions aimed at addressing the planet's most precious and imperiled resources.

A concurrent examination of two heterogeneous cities and their distinct environmental challenges can provide cross-cultural partners fertile ground upon which to meet, research, discuss, and design for

global sustainability issues such as the water crisis. Suzanne Goldenburg from *The Guardian* states that, while "growing demands from agriculture, an expanding population, energy production and climate change" continue to threaten water supplies, "one in seven people on the planet lacks access to safe drinking water" (2014:np). In this regard, the cities of Doha (Qatar) and Rochester (New York, USA) offer ample opportunity for design students to jointly consider a spectrum of water issues within their two distinct locations.

Due to the scarcity of freshwater in Doha, almost all fresh-water is either imported as bottled water or provided through the municipal water supply as desalinated seawater (Momani 2006:589). Water consumption rates are of great concern in this arid desert region (Roudi-Fahimi, Creel & De Souza 2002:7), however, for both non-Qatari residents and Qatari citizens, the monetary costs of water are comparatively low. Although its geographic traits are drastically different, the cost of water is similarly low for Rochester residents. Rochester sits at the foot of the Great Lakes, which house approximately 21% of the world's fresh water supply, according to the United States Environmental Protection Agency. At the same time, water quality should be of utmost concern for the Great Lakes as they hold around 84% of North America's surface fresh water, but only 1% of the water flows out of them each year, which means that pollutants entering the lakes can become concentrated over time (EPA 2012:np). These drastically different cases illustrate the need for individuals, businesses, cities and countries to become more aware and judicious in their treatment and use of water resources.

Research framework

This study involved 19 total design students from two senior-level Graphic Design courses taught concurrently in Doha, Qatar and Rochester, New York, USA during the Spring 2014 semester. 'Design for a Sustainable Future' at Virginia Commonwealth University in Qatar encouraged a critically engaged application of design craft and design thinking to current and future societal challenges. The course examined how design can raise awareness about global and local water sustainability issues in a spatial and experiential context. Meanwhile, 'Advanced Web & Interactive Design' at Rochester Institute of Technology investigated design for user experience through a focus on human-centered research and a systemic view of designed products and services. Students in this course sought to leverage digital communication to raise awareness, build community, and change behaviors around water consumption.

Course methodology: water sustainability in design pedagogy

With water sustainability as a common thread, both courses prioritized engagement with local communities and environmental stewardship through the application of design thinking in a cross-cultural setting. Faculty encouraged discussions of water pertaining to the following areas: consumption, quality, availability, ecology, and culture. Identifying specific themes helped students dissect the complex topic and view its diverse facets. Initiating a broad approach to in-class discussions on the social and ecological centrality of water made the multilayered topic more approachable to participants. At the same time, the complexities of sustainability topics can often overwhelm or depress students. Therefore, future-forward thinking and concepts of 'design for positive change' were also fundamental to the learning objectives of the collaboration.

Students conducted primary and secondary research that involved conducting interviews, administering surveys, and creating personas to help them carefully consider their audience at all stages of the design process. An informal population analysis, incorporating statistics, local news

reports, and observations of consumer habits, also contributed to the learning process. Collaborative, generative design activities such as ‘a day in the life with water’ (Figure 1) and ‘team intervention remix’ (Figure 2) helped the intercultural teams build camaraderie as they envisioned behavioral shifts towards limited water resources. These explorations into personal habits with water—and their consequences—also helped students make informed judgments on how to best position their design interventions within their immediate communities.

Extensive research into a singular facet of the water crisis was instrumental in the development of some of the most successful projects. Upon narrowing the focus to one aspect of a larger issue, students began to dissect the advantages of ‘design thinking’ for environmental good with a series of prototypes and testing. Keeping project outcomes open within the course requirements encouraged communication between student teams and enabled compatible solutions to emerge across a variety of media. At the final stage of the investigation, a clear understanding of the target audience became invaluable for students to determine the most appropriate medium for their design intervention.

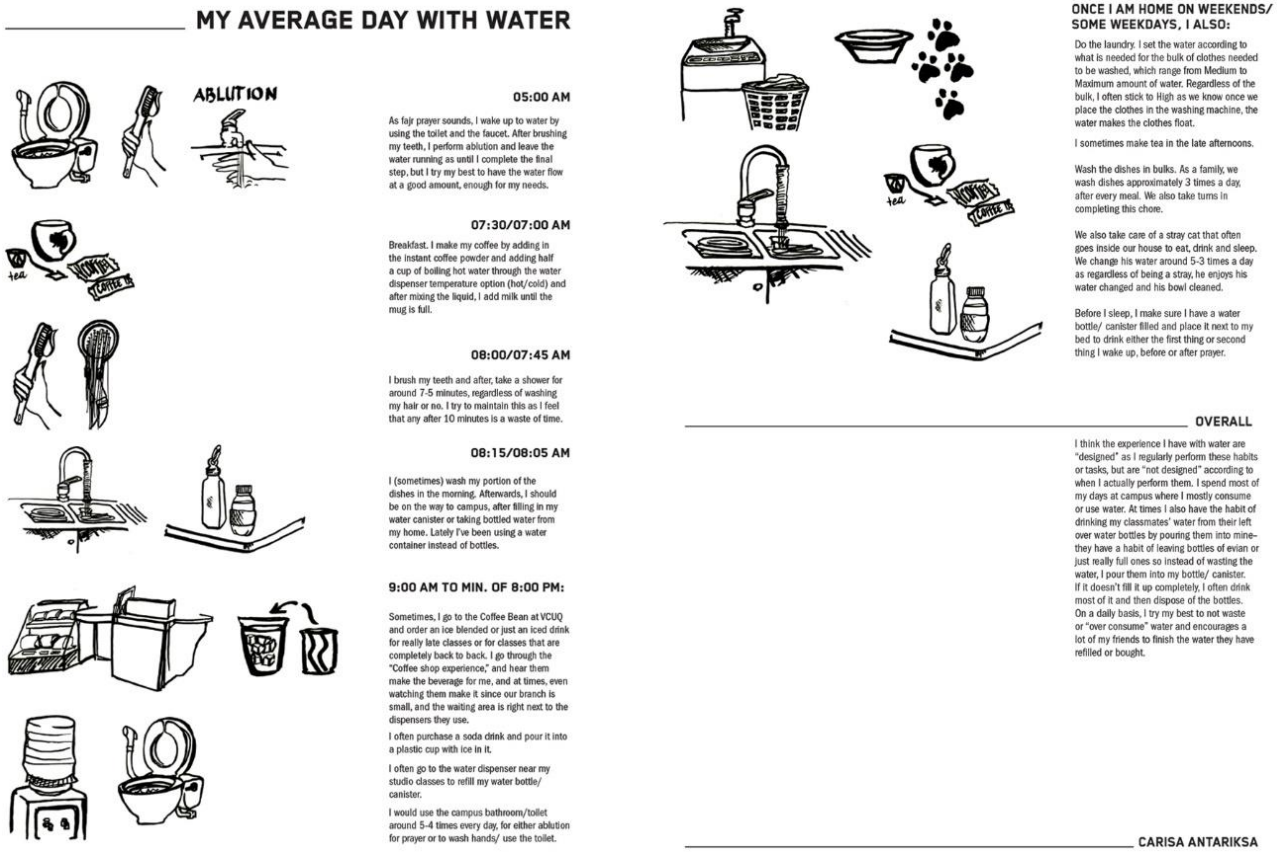

Figure 1: A day in the life with water activity, Carisa Antariksa (Doha)

Figure 2: Team interventions remix activity, Catherine Fe Calma Chiuco (Doha) in collaboration with Brittany Norton (Rochester)

Crossing virtual boundaries: cross-cultural partnerships

Collaboration with cross-cultural partners can help to broaden student perspectives on global trends and viewpoints embedded within their research. Previous iterations of virtual exchanges led by the two design educators encouraged freshman and sophomore-level design students to collaborate remotely, exchange ideas, and investigate possibilities of cross-cultural design. While these prior courses focused primarily on cultural learning (and exploring similarities and differences through design projects), introducing the theme of water sustainability gave the most recent group of partners an opportunity to connect through consideration of a topic of international concern.

In contrast to previous methods of creating cross-cultural teams between the two classes (e.g. by random selection or by matching complimentary personality traits), the instructors assembled cross-cultural pairings based on students' mutual interests in water subtopics. For instance, one partnership was built around the theme of *bottled plastic water*, exposing team members to each country's unique circumstances embedded within the subject. Initially, partners in Rochester could not understand why their counterparts in Doha were 'promoting' the use of bottled water, while they conversely focused on encouraging the use of tap water to minimize the use of disposable bottles and help reduce waste. The dialogue between the cross-cultural partners exposed Qatar's current reliance on bottled water as 'safe' drinking water, the public anxiety (and social stigma) around consuming desalinated tap water, and the use of plastic bottles as a concern wrapped in necessity.

Inasmuch as the Qatari students realized the value of reusable bottles filled from the five-gallon polycarbonate containers popular throughout the country, they also recognized the need to find positive uses for the smaller plastic containers provided at all restaurants as table water. The students,

consequently, developed an installation to teach children about the importance of recycling within an activity area dedicated to converting used water bottles into puppets (Figure 3). By engaging their imagination and creativity, participants learned about the importance of conserving water and reducing waste through play.

Figure 3: The "Water Warriors" installation gives children an opportunity to repurpose plastic water bottles that would otherwise be discarded (Lolwa Al Khater & Maryam A Al Kaabi, Doha)

Similarly intrigued by the topic of bottled water, the Rochester-based partner pondered its prevalence in her own city. Though Rochester has a plentiful supply of clean freshwater resources, many people still regularly purchase and consume large quantities of bottled water. The student saw this behavior as an opportunity for design intervention. After brainstorming and working through many different directions, including online quizzes and games that could be spread via social media, the student ultimately conceived of "Go Tap" as a result of discussions and design "remixes" with her partners in Doha (Figure 4). "Go Tap" is a campaign that promotes tap water consumption by engaging "kids of all ages" in an online art contest that promotes drinking water from the municipal supply.

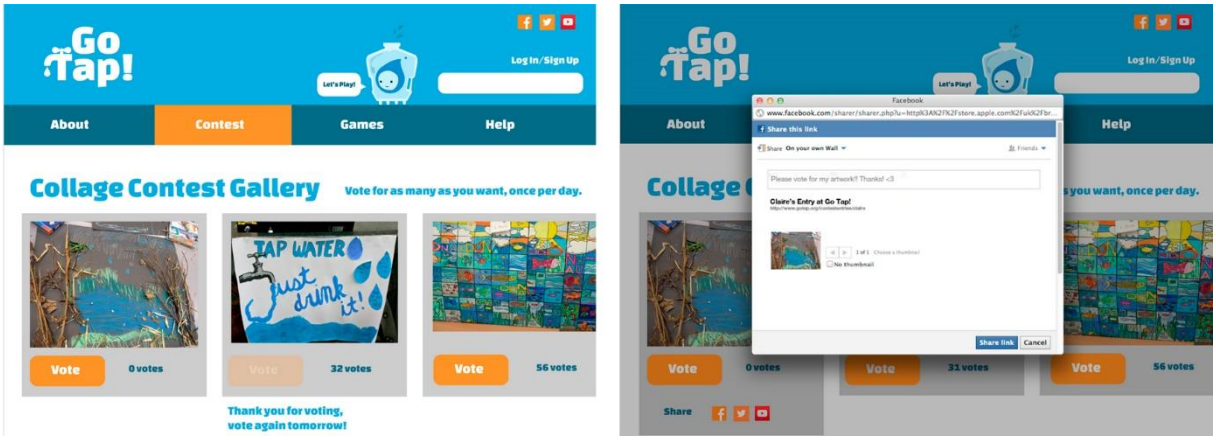

Figure 4: "Go Tap" website prototype encourages the community to submit, vote on and socially share artwork that encourages tap water consumption (Brianna Hanley, Rochester)

Inspired by cultural insights between water utility companies in the two cities, a pair of Doha-based students explored the lengthy and expensive process of desalination, a procedure that removes the salt content of water and requires the use of high-levels of energy for production. The local community is aware that this is the source of water in Qatar, but they are not aware of the delicate industrial process to produce clean water. The students created dimensional, wood cut panels, which created

an environment for digital animations. Together, the wooden “landscapes” and animated characters educated members of the Doha community about desalination and the energy it takes to produce a comparatively small amount of drinking water (Figure 5).

One of these students teamed up with a student in Rochester, who was interested in the idea of public and private control and consumption of resources. Inspired by the visual approach within her partner’s animation (mentioned above), she considered a variety of concepts that could potentially incorporate the characters. Eventually, she created a prototype for a game called Water Wars (Figure 6). As players construct and manage their own cities, the game teaches them about potential water-related conflicts based on the results of the choices they make for their model cities. Not only did the student incorporate an important learning opportunity into the engaging context of game play, but she also integrated her partners’ characters as avatars that represent the players.

Figure 5: “From Salt to Sweet” combines video-based animation that describes the desalination process with wooden models of the physical plant to help illustrate the complexity of desalination (Catherine Fe Calma Chiuco & Barbara Charrue, Doha)

Figure 6” The “Water Wars” game teaches players about the history and future of water’s sociopolitical connections as they manage simulated cities (Brittany Norton, Rochester)

Virtual tools: dialogue and critique

Synchronous and asynchronous virtual communication tools are powerful mechanisms for cross-cultural dialogue and critique. While managing time differences and expectations for fast correspondence is a persistent challenge, applications and platforms such as Google+ and Skype can be invaluable in maintaining fluid discussion across distances. The Designers Accord notes that in sustainability education,

> the seamlessness and accessibility of these avenues of communication can provide a means by which conversation can continue outside the classroom. Social media provides a more casual and non-committal medium, and a method to brainstorm ideas and new possibilities for a project amongst all stakeholders and co-creators. (Designers Accord 2011:6)

In previous semesters, critique via email alone resulted in mixed success. Many students were unable to provide critical, constructive feedback for fear of overstepping cultural boundaries and unintentionally offending their partners. Students not only found it difficult to give in-depth feedback to one another, but the format did not enable faculty oversight to articulate expression and encourage critical analysis. However, the use of live video chat (such as Skype) enabled topics of cultural similarity and difference to emerge as students worked together to analyze audiences, discuss habits and behaviors, and consider the functional, social and symbolic roles of water in both countries.

Introductory Skype meetings between the geographically disparate design classrooms helped students become acquainted with one another in a relaxed atmosphere while increasing their excitement for forthcoming discussions in smaller groups. The integration of shared virtual spaces for collaboration (such as Google+) extended dialogues between the students in both public forums and one-on-one critique environments. Constructive dialogue between students accelerated the communication feedback loop, resulting in self-initiated commentary on the visuals posted by the other class.

As the collaboration progressed, the two professors encouraged increased analysis amongst the two classes and between partners. Virtual critiques between the instructors and the opposite class via Skype also added positive pressure to the classroom dynamic, holding students accountable for their own progress. Students in both classes appreciated hearing another instructor's perspective and indicated in their final course surveys that they found this feedback to be particularly instrumental to their project outcomes.

Public exhibitions: engaging the community

The final outcome of this pedagogic research was a series of public exhibitions of student design projects in both Doha and Rochester. The Doha class gave the inaugural exhibit the name "My Mai," an English/Arabic play on words meaning "My Water." While the course in Doha focused primarily on creating physical or interactive touch-points specifically for an exhibition context (using iPads, projections, and activity areas), the Rochester class proposed a range of interactive solutions (such as games, "smart" appliances, and how-to sites) geared toward educating and changing behaviors around water use. In both cities, the exhibitions illustrated the inherent complexity and systemic impacts of water sustainability as well as its inextricable relationship with human emotions and habits.

Using multiple formats, interactive media, and the elements of both 2D and 3D space, the Doha exhibition (Figure 7) and Rochester exhibition (Figure 8) highlighted issues of water scarcity and desalination through a series of designed experiences. Each installation centered on a different water-related theme and encouraged visitors to shift their excessive water consumption practices to more conservative ones. Through poetic and pragmatic approaches, the exhibitions delivered the poignant message that community involvement is needed to respond to the water crisis in a timely manner.

Figure 7: My Mai: My Water, My Change—Exhibition (April 8-10, 2014)
Saffron Hall, Virginia Commonwealth University in Qatar, Education City, Doha, Qatar

Figure 8: Gulf to Great Lakes—East/West Exhibition (May 14-21, 2014)
Imagine RIT: Innovation and Creativity Festival, Rochester Institute of Technology, Rochester, NY, USA

Exhibitions were also a meaningful stage in students' learning experience. Their significance to the collaboration cannot be overemphasized in terms of providing students with tangible goals to work toward as a team, motivating students to refine the work, and giving them opportunities to see the impacts of their designs in action and in the hands of actual users. Working toward the exhibitions not only strengthened relationships between the geographically distinct classrooms, but also amongst students within the same course as they put in extra hours to finalize their public displays.

Benefits and challenges: opportunities for improvement

Upon completion of the semester, students electively responded to project evaluation prompts to share feedback on the learning outcomes, cross-cultural collaboration, and sustainability knowledge. In addition to providing instructors with a qualitative measure of each student's experience, students also provided quantitative feedback regarding their learning outcomes and impressions of the course through completion of an optional online survey. Findings from both courses revealed an appreciation for the cross-cultural opportunity on a personal level, but also point to challenges in working together on a singular design project due to logistical difficulties in time zones, course schedules, and skill sets. Moreover, the course evaluations further suggest that students emerged from the intercultural opportunity with improved understanding of global water challenges (Figure 9), along with stronger skills in cultural collaboration (Figure 10) and virtual collaboration (Figure 11).

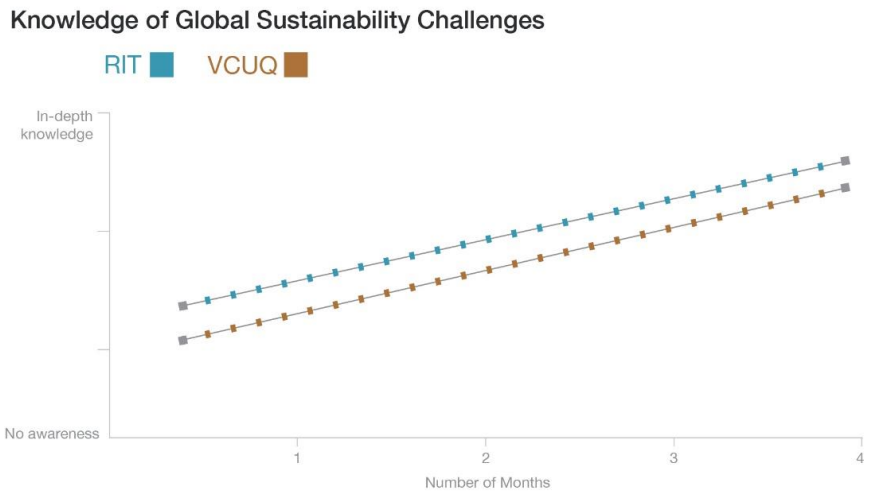

Figure 9: Students' perceived knowledge of global sustainability challenges before and after the project.

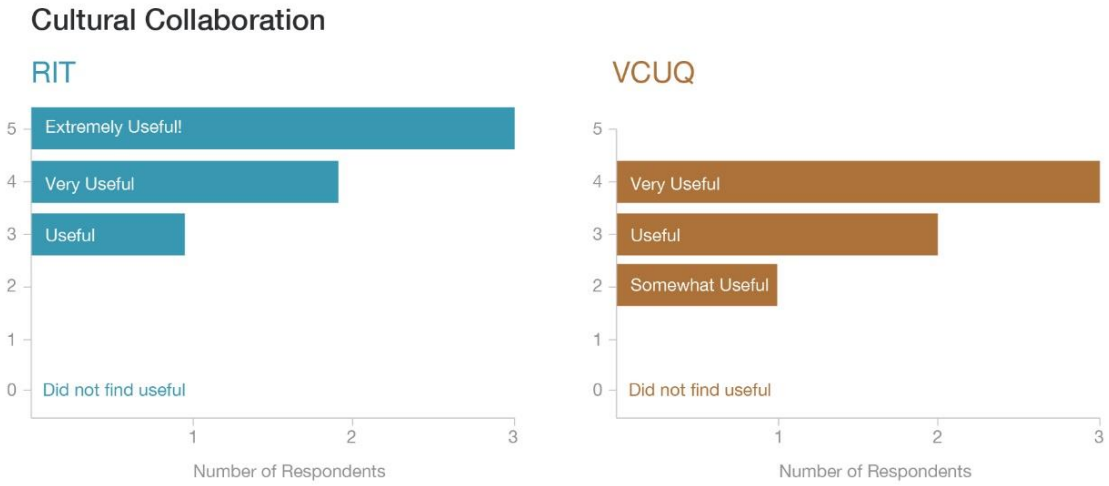

Figure 10: Students' perceived improvement in cultural collaboration skills after the project on a scale of 1 to 5. The scale rates 5 as 'extremely useful' and 1 as 'did not find useful.'

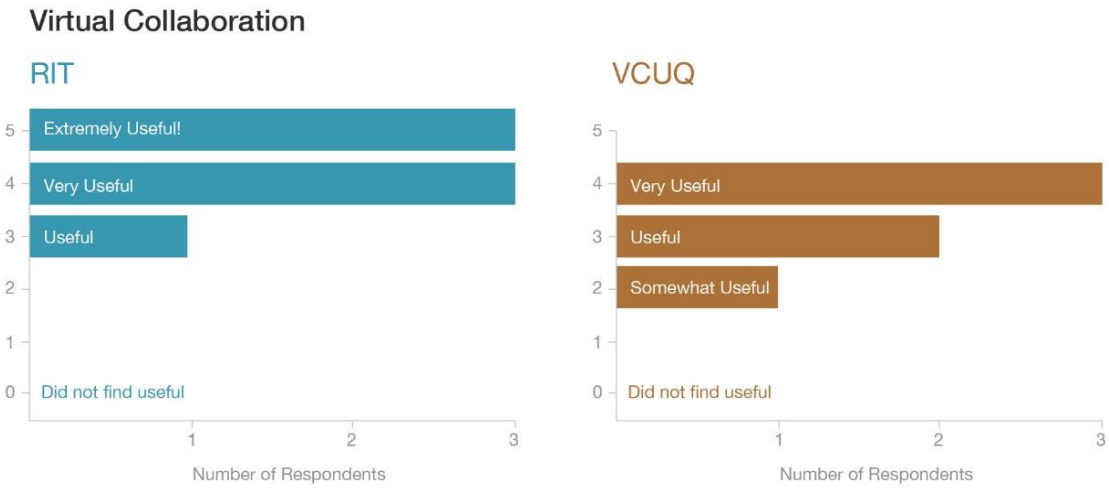

Figure 11: Students' perceived improvement in virtual collaboration skills after the project on a scale of 1 to 5. The scale rates 5 as 'extremely useful' and 1 as 'did not find useful.'

Although students in both courses cited their 7-hour time difference as a challenge, technology served as an important tool for improved synchronous and asynchronous communication between teams. Additionally, final exhibits at the end of the semester were a useful factor within the theoretical studio environments to motivate students to share the relevancy of their investigations. Future pedagogic research may benefit from identifying the impact of such design interventions in terms of behavior change of the exhibition audience in regards to water use. A participatory analysis of the cultural relevancy and social impact of the projects in both cities would strengthen the aforementioned outcomes, challenges, and opportunities for future projects.

Conclusions

The intent of this study was to promote collaboration and cross-cultural learning between design students located in North America and the Arabian Gulf Region to help improve water conservation practices at the individual and community levels. Findings indicate that working towards a common goal, such as water sustainability, helped bond partners together and gave participants a sense of purpose through mutual goals. The use of social media and class introductions via video-conferencing were equally beneficial in humanizing each class for the other, and building rapport and accountability between partners. Open project briefs encouraged students to communicate with each other to exchange, discuss and critique ideas and to work together toward compatible and supportive design interventions. In the end, helping students understand that a diverse team adds value—and that cultural differences offer promising opportunities for creative innovation—were paramount to the learning outcomes.

Findings of this study identified the positive effects of cross-cultural collaborations to address sustainability topics, and provide strong evidence of its benefits for design education. Evaluations indicate that learning to work with intercultural partners with different perspectives and values is beneficial in terms of developing critical thinking, leadership, and interpersonal skills for professional readiness. Findings also indicate that the nature of this collaboration also offers an opportunity to develop cultural sensitivity, investigate alternative design methodologies, and foster design innovation. Students who participate in cross-cultural exchanges around social initiatives can, therefore, emerge from academia as strong assets to the field of design and as engaged global citizens. Ultimately, the nature of this research underpins the need to support ongoing student-based initiatives that encourage synergistic partnerships across cultures to improve social design curricula and to extend these objectives in professional practice.

Acknowledgement

We would like to express our sincere thanks and appreciation to our students for their participation in this research.

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