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**Design Nexus: integrating cross-cultural learning experiences into
graphic design education**

Kelly Murdoch-Kitt & Denielle Emans

*Abstract: Design educators must learn to develop and lead successful intercultural
projects and exchanges for students entering into a globally connected and diverse
profession. Teaching students to approach problems by using collaborative and inter-
personal skills provides them with durable assets to better understand international
audiences, colleagues, and perspectives. The proliferation and integration of first-hand
cross-cultural experiences into design curricula can result in innovation and knowledge
sharing, indicating synergistic properties in which the whole is greater than the sum of
the parts. This research explores how collaborations between geographically separate
design students in San Francisco, California, USA and Dubai, UAE—mediated by
virtual communication—can impact learning, cultural awareness, and audience
sensitivity. The two distinct courses challenge students to work together in teams, un-
derstand a range of audiences, give and receive critical feedback, exchange projects,
and respond with culturally sensitive design solutions. The paper introduces the
rationale, methods and design-related outcomes of a series of collaborations to en-
courage design educators to develop cross-cultural methods in their own classrooms.*

*Key Words: Cross-cultural, design education, collaboration, internationalism, cultural
perspective, virtual communication.*

Design Nexus: integrating cross-cultural learning experiences into graphic design education

Authors

Kelly Murdoch-Kitt /
Rochester Institute
of Technology /
College of Imaging Arts
& Sciences /
School of Design /
Department of Graphic Design /
kmmfaa@rit.edu

Denielle Emans /
Virginia Commonwealth
University Qatar /
Department of Graphic Design /
djemans@vcu.edu

Introduction

A case for cross-cultural design education

As twenty-first century design professionals engage in an expanding global landscape, prowess in international systems and marketplaces is more necessary than ever before. Designers must not only understand how to connect with widespread audiences in visual terms, but employ a range of communication skills to collaborate practically with international partners. From large-scale initiatives to community-based, grassroots projects; creating for and alongside different cultures is increasingly commonplace in professional design practice. In this regard, the importance of culture, language, religion, tradition, and gender is not only paramount to effective communication with each unique audience, but is of utmost importance to collaborations with multinational business partners, interdisciplinary team-members, and community participants. At the same time, young designers often lack the soft skills required to succeed in this "connected" intercontinental workplace. Their educational process should prepare them in developing skills to better understand cross-cultural issues, audiences, and colleagues.

The design classroom offers a valuable opportunity to help students develop cross-cultural awareness and communication skills for future professional practice in global terms (Schadewitz, 2007, p. 2). Wang (2011) supports the need for undergraduate students to cultivate "intercultural communication skills and sensitivity to cultural differences" by citing a range of positive experiential outcomes. Rationales involve preparing to enter a "global marketplace", developing "world mindedness" and inspiring students to "civic action to re-dress global injustices" (Wang, 2011, p. 243). Likewise, the integration of first-hand cross-cultural experiences into design curricula can result in design innovation and knowl-edge-sharing, indicating synergistic properties in which the whole is greater than the sum of the parts.

Beyond the practical application within industry, additional socio-political benefits to cross-cultural educational experiences include "respect for cultural diversity and preservation of the elements of cultural identity" (Sánchez Sorondo, 2005). According to Sikkema and Niyekawa,

> Methods and manners of communication are so ingrained in us through our culture that we normally do not even begin to become culturally aware until some kind of cross-cultural communication breakdown occurs and we find that things simply don't mean the same. (Sikkema & Niyekawa, 1987, p. 28)

For those living in ever-diversified environments, learning to understand and accept other cultures helps diminish conflict and serves local communities' best interests (Gay, 2000, pp. vii–viii) by promoting "peaceful understanding and tolerance, thereby identifying and encouraging true human values within an intercultural perspective" (Sánchez Sorondo, 2005, p. 259).

Design educators must prepare students to communicate, interact, and thrive in this present-day global environment. As Blair-Early (2010, p. 211) suggests: "Along with the rapid expansion of a potentially international audience, designers are being asked to solve multifaceted problems that address issues of sustainability and globalism". A successful cross-cultural design experience can help young designers enter the profession with multicultural sensitivity and sensibility, along with collaborative experience.

These qualities give young professionals a competitive advantage not only in the workplace, but also in terms of enhancing their sensitivity, self-awareness and visual work.

In order to help students develop techniques for communication with both international audiences and design professionals, design educators can guide them in immersive and collaborative processes. In particular, if faculty learn to employ current digital tools with an understanding of how to facilitate interpersonal interactions, students can discover new ways to transcend barriers of time, distance, language, and preconceived notions (Blair-Early, 2010, p. 213). For instance, classrooms located on opposite sides of the globe can emulate the communication realities of praxis, connecting through technologies such as email, cloud-based collaborative tools, and various social media (Moldenhauer, 2010, p. 226). Integrating these methods into design curricula also help students navigate behavioural intricacies of language and culture, rather than understanding other cultures through second-hand resources (Wang, 2011, p. 244).

Regardless of how much time instructors can devote to cross-cultural activities in the classroom, engaging in global discussion is at the forefront of the contemporary practice of design. The design classroom can prepare students for the rapid evolution of technology, global communications, and the evolution of education itself. Kurzweil argues that the current democratization of information will bring an influx of virtually-mediated education at all levels, accessible from anywhere in the world (Kurzweil, 2005, p. 249). Integrating cross-cultural collaboration technologies into design classrooms will ensure that design continues to play a formative role in this indefatigable networked global community. With these valuable experiences, students can emerge from the design classroom better equipped to handle a range of global opportunities and navigate the multicultural reality of design practice.

Developments in intercultural collaborative design education

There is a present need to expose design students to problems beyond surface-oriented questions of form, and instead explore larger issues and ideas through their visual work (Blair-Early, 2010, pp. 213–215). However, several pitfalls exist within the structure of most traditional design curricula, including the fact that, "as design programs become overloaded with courses focused on providing new technical skills, the ability to develop cross-disciplinary and cross-cultural experiences diminishes" (p. 210). An English-language literature review revealed plentiful sources on collaboration, cross-cultural communication, or virtual communication technologies; however, there is little existing research that combines these topics together with productive, design-related outcomes (Schadewitz, 2007, p. 2). Though there is some documentation of cross-cultural design education projects or courses, many of these involve cultures that already reside within the same community, or are temporarily collocated through study-abroad programs.

Blair-Early describes several cross-cultural and multidisciplinary collaborative design education projects that have taken place at University of Wisconsin-Milwaukee in recent years, though the paper does not cover any of these virtual exchanges in great detail. The paper briefly discusses "the role of social networking tools and participatory research in addressing cross-cultural and multicultural challenges" (p. 208). Buck-Coleman's "Sticks+Stones" project examines a cross-cultural exchange within American borders that took place between students located in the states of California, Utah, Maryland and Alabama—vastly different corners of the United States (Buck-Coleman, 2010, p. 193). "Sticks+Stones" focuses on the ethical implications of "how personal beliefs of race, religion, socio-economic class and other differences impact visual messages" (p. 191). The 2005 and 2006 collaborations took place through correspondence, but in 2006 the project culminated in a brief symposium at the Museum of Tolerance in Los Angeles, which gave students an opportunity not only to interact in person, but to provide feedback and engage in challenging discussions face-to-face (p. 196).

Schadewitz's research examines exchanges over a three-year period between interaction design students in Korea, Austria, Hong Kong and Taiwan as they collaborated on various "design patterns"—also relying on virtual communication to exchange ideas and

visuals (Schadewitz, 2007, p. 26). Moldenhauer, meanwhile, discusses the potential pitfalls and merits of introducing virtual collaboration technologies to design classrooms in the first place (Moldenhauer, 2010, p. 222). Virginia Commonwealth University, Qatar presents a different kind of cross-cultural design education model: in their particular example, American design pedagogy has been imported to Qatar's "Education City" in Doha, the capital. Yyelland and Paine describe "Pros and Cons of American Education" through the eyes of their predominantly Qatari students (Yyelland & Paine, 2009, p. 127).

Research opportunity and goals

Cross-cultural design collaboration is the effective exchange of ideas, information, decision-making, creative-work, and critique to arrive at shared design solutions. At some point in their educational process, design students should have a cross-cultural communication and collaboration experience, regardless of whether they have an opportunity to study abroad, to learn from an instructor of a different culture, or to interact virtually. Wang notes that, while collaboration itself has been widely researched and documented, discussions of intercultural collaboration are less prevalent in general due to the difficulty in developing and leading successful projects (Wang, 2011, p. 244).

In response, this research explores how design collaborations between geographically distinct teams can improve cultural awareness and audience sensitivity beyond embedded cultural norms. With the aim of encouraging design educators to develop methods for intercultural collaboration in their own classrooms, this paper evaluates the rationale, methods and outcomes of a series of cross-cultural collaborations between design students from University of San Francisco (San Francisco, California, USA) and Zayed University (Dubai, UAE). The investigation examines how collaborations—mediated by virtual communication—can impact learning experiences, promote cross-cultural communication and understanding, explore similarities and differences, change ideas of representation, and address perceptions of "self" and "other". The ongoing research documented in this paper tests whether two geographically distinct design classrooms can improve cultural awareness and audience sensitivity beyond embedded cultural norms—using design thinking approaches and virtual communication tools—while successfully teaching prescribed design learning objectives.

Research framework

This research involved 51 university students studying design in Dubai and San Francisco. The participants had no previous experience in cross-cultural design collaboration and were enrolled in two distinct design classes offered to students at all academic levels. Although the two classes ran during differing academic calendar cycles, the courses were conducted concurrently during Spring and Fall 2012 semesters. During both semesters, the American students attending the University of San Francisco (USF) were enrolled in Visual Communication 1, whereas the Emirati students attending Zayed University (ZU) were enrolled in Typography 1 during the Spring semester and Graphic Design 1 during the Fall semester.

Though the courses had different titles, they encompassed many of the same learning objectives. Their mutual design objectives included teaching a basic working knowledge of typography and image-making, and an understanding of how to design for specific audiences. Both courses required students to develop technical skills using software such as Adobe Illustrator, Photoshop and InDesign. Each used the same texts—Thinking with Type and Graphic Design: The New Basics (both by Ellen Lupton)—and worked with the formal design principles outlined therein.

In order to test the efficacy of the design projects in generating cross-cultural proficiencies, the two exchanges were conducted at varying lengths of time. The Spring 2012 exchange lasted for approximately three months, whereas the Fall 2012 exchange was conducted within a three-week timeframe. As opposed to the nearly semester-long design collaboration in Spring, the Fall exchange was inserted into a more typical curriculum of

classroom-oriented projects in order to provide a cross-cultural perspective on different forms of design in various media. The Fall collaboration (between 21 American and Emirati students) attempted to explore whether there would be similar merit in an intercultural exchange at a smaller scale.

The ZU academic curriculum requires all students entering the baccalaureate programs to effectively communicate in English and Modern Standard Arabic. A student who has yet to reach the standard is automatically enrolled in the Academic Bridge Program; the English as a foreign language program which prepares students for admission to the university degree programs. Depending on entry level, a student may spend between nine weeks (entering at the highest level) and two years (entering at the lowest level) learning English.

The Emirati students involved in the design collaboration were majors in the College of Arts and Creative Enterprises, having completed the aforementioned Academic Bridge program. On average, the ZU participants had intermediate levels of English comprehension in speaking and listening, and moderate levels of English comprehension in reading and writing. On the other hand, only one of the American students could speak and write in Arabic. The English-speaking faculty members, located in their respective cities, led the Spring and Fall semester courses in English, while encouraging the use of bilingual design outcomes.

Pairing of the geographically distinct classrooms in each semester was primarily based on complementary characteristics outlined in Digman's five-factor model of personality (Digman, 1990, p. 433). To create these student teams, the instructors carefully assessed each member of the class using a shared spreadsheet detailing students' personality traits, interests and design strengths. Furthermore, the uneven numbers between the two classes in the Spring semester, required the formation of trios; coupling two Emirati students with one American student. By partnering Emirati students together based on language competency skills, the trios worked well to ease some of the anxiety associated with second-language correspondence.

During both semesters, the 12-hour time difference between students required the use of asynchronous communication tools as a primary means for exchange and dialogue. Email and cloud-based collaborative technologies enabled participants to communicate in writing and exchange images and files with each other.

Speculative project goals
The two courses aimed to challenge students' assumptions of self and "other", to understand a range of audiences, and to respond with culturally sensitive design solutions. Aside from evaluating their visual projects, important aspects of both exchanges were regular writing assignments that accompanied each project phase. While each of the four projects had unique sets of learning outcomes tied to the objectives of each course (as defined by each department or program), the overall collaboration was founded on the following goals:

DESIGN
- Guide students through a series of team-oriented design projects, with the assumption that some might be hesitant to participate due to self-consciousness about language or anxiety about cultural differences.
- Introduce students to the Adobe Creative Suite (specifically Illustrator, Photoshop and InDesign on Macintosh platform).
- Ask students to generate visual work inspired by images and input from their partners, with the assumption that they might influence each other's visual design work.
- Encourage students to expand their visual language, explore new design concepts, and broach topics such as "similarity" and "difference".
- Explain how cross-cultural communication and collaboration are valuable professional skills for an international design market.

AUDIENCE
- Evaluate students' shifts in perception of audience, representation, and the "other" based on project completion. Encourage self-assessment, measured through written or visual coursework.
- Examine students' increase in local cultural understanding and how they apply "self" as a lens for reading another's cultural norms and as a way to widen awareness of what a persona—or audience—could be.

COMMUNICATION
- Teach students to work cooperatively using synchronous and asynchronous tools for distance collaboration, such as Dropbox for file-sharing, Google Drive for collaborative writing, Skype and other video chat software for live communication, and general guidelines for professional email correspondence.
- Encourage students to independently explore other means for communicating and cooperating across distance to effectively produce specific design assignments, such as Instagram, Twitter, iChat, Facebook, Talkatone and BBM.
- Implement the use of constructive critical feedback as an important part of team interactions, with the assumptions that difficulty will arise due to the asynchronous communication technique, and that, as introductory design students, both groups will be new to critique.
- Support students in building collaborative working skills and practice openness to cross-cultural interactions, with the assumption that logistical issues of language, cultural translations, anxiety, and time difference will likely create communication challenges.

SOCIAL LEARNING
- Embolden students to discuss potentially polemical topics, such as religion or politics, within a structured and safe environment.
- Promote collaboration both as tool for cultural diplomacy and as a relevant industry skill, with the assumption that students would likely have little previous knowledge of the other culture.
- Measure students' visual and written work in terms of what they learn from their partners' cities, cultures, and design styles.
- Encourage students to develop friendships—or at least empathy.

Methodology

Human-Centred Design

The instructors followed design thinking and Human-Centred Design (HCD) methodology to engage in a series of projects that required students to work together in teams, exchange projects, and give critical feedback (IDEO, 2012, p. 8). Design thinking is a human-centred practice that follows a system of overlapping phases defined as inspiration, ideation, and implementation (Brown, 2008, p. 88). Researchers at the HPI-Stanford Design Thinking Research Program further describe the process as: define, understand, ideate, build, and test (Plattner, 2011, p. xiv). Similarly, IDEO's Human-Centred Design Toolkit helps designers analyse an appropriate solution for each unique context by applying the phases: hear, create, and deliver (IDEO, 2012, p. 8). Following these methodologies, the geographically-distinct teams researched local culture, developed an understanding of international perspectives through their partners, and used virtual technologies to arrive at collaborative design solutions.

Three-month cross-cultural design collaboration: Spring 2012

Spring 2012 began an ongoing international design education experiment between 30 students (of the 51 total participants) located, as noted above, in San Francisco and Dubai. The project launch introduced the two introductory design courses to a variety of concepts, processes and steps important to the success of the collaboration. Class discussions

encouraged students to consider both a global perspective and a local understanding of the idea of "city", using design as a tool for cross-cultural sharing. The students engaged in four different guided design assignments and produced visual artefacts that they exchanged with their partners. In some cases, the partners modified the work and returned it to the original creator. In all cases, the students were asked to send each other constructive criticism regarding the projects they created and to write brief reflections on each project phase.

Before being introduced to their partners in the other culture and beginning the design portion of the project, students were asked to casually write down their thoughts of the other culture. The students were encouraged to brainstorm, "thinking aloud" on paper as they recorded stream-of-thought knowledge or assumptions of the other city and culture. This was done in class as a personal reflection. These writings were not shared with the other class at any point; students could think and write freely, knowing this content would not be judged or criticized. Following this in-class exercise, students began to research the other city in more detail in order to challenge their previous assumptions, start discovering their biases, and bring a more accurate picture of the city and its culture to the project. This brainstorming and research phase excited students about the upcoming interaction with their soon-to-be international design partners in the other class. After completing this phase, students naturally started developing questions to ask their overseas partners.

The visual exchange was initiated with a photo "scavenger hunt" and image trade. Teams were assigned different lists of design principles (e.g. rhythm & balance, scale, texture, transparency) to help capture and define their cities in visual terms. Each team also received a different oppositional word pairing (e.g. liberal/conservative; natural/man-made; professional/playful; native/foreign, see figure 1; open/closed, see figure 2; historic/modern, see figure 3), in order to give the partners a relatable starting point from which to gradually expand their perspective on the other culture (Sikkema & Niyekawa, 1987, p. 23). Each student individually created definitions for the terms and photographically captured at least 24 photos of the two contrasting concepts within her own city to submit to her overseas partner. Using the oppositional concepts allowed students to critically examine cultural influences in their own city before attuning themselves to the other city. Next, through a written component of the assignment, students shared the qualities and characteristics of their own cities with their partner while simultaneously evaluating the city of their partner through an exchange of imagery via Dropbox, a cloud-based file-sharing service.

Figure 1: An Emirati student created these contrasting images of coffee consumption to illustrate her interpretation of the assigned theme of "Native/Foreign" as a way to depict this concept in her city. Coincidentally, her partner also took a photo of a Starbucks cup as a representation of "foreign".

Figure 2: These photos were created by partners assigned the word pairing of "Open/Closed". The image of the street musician was captured by the student in San Francisco; the woman in traditional Emirati attire in the right was created by the partner in Dubai.

Figure 3: The product of another pair of partners, these images of traditional henna and a tattoo illustrate students' definitions of "Historic/Modern."

As the project progressed, the two instructors encouraged the students to uncover ideas beyond their initial research and share their perspectives through one-on-one email conversations. Researchers note that during initial interactions, people tend to identify a new cultural group through stereotypes; however, participants should pay careful attention to a broad range of cultural aspects as communication progresses while making sure to adjust and refine initial perceptions (Maude, 2011, p. 132). According to Adler and Gunderson (2008, p. 80):

Perhaps the most difficult skill in communicating across cultures involves standing back from yourself; becoming aware that you do not know everything, that a situation may not make sense, that your guesses may be wrong, and that the ambiguity in the situation may continue.

For students engaged in cross-cultural communication, careful attention to communication styles, regional sensitivities, and distinctive cultural factors is crucial when developing collaborations. Not only is openness to learning about new ideas and viewpoints necessary, but it also demands rumination on ones own ethnocentric misinformation about other societies and their cultural beliefs. French and Bell's "iceberg model" of culture further explains the importance of understanding "hidden" implicit values of a culture, along with more obvious physically or socially manifested values (French & Bell, 1995, p. 7). Accordingly, each geographically distinct classroom independently discussed issues that might arise during the partnership and the need for sensitivity in regards to topics such as politics, religion, and gender. This self-reflective learning experience was an opportunity for students with no prior cross-cultural experience to understand the need to approach such collaborations with a mind-set of cultural relativism.

While instructors guided students in approaching the collaboration with sensitivity, the photography topics were selected with the expectation that they might elicit discussions about politics, religion, and women's rights as differentiators to discover through design. In this regard, the two instructors encouraged students to explore topics within the safety of the academic environment and during private correspondence. However, even after months of communication, the majority of students remained hypersensitive to the assigned topics, tactfully avoiding them even when prompted to "dig deeper". In future efforts, it may be more effective to assign students specific polemical topics to discuss via email or assign synchronous Skype discussions for homework. Inasmuch as time differences may create a challenge for these types of interactions, the value of creating opportunities for discerning discussions may improve students' multilateral development, as long as a culturally relativistic approach precedes the communication.

Following the image exchange, students highlighted similarities and differences between the cities, sharing thoughts about their cumulative visual research within each class. They shared their initial visual and anecdotal research, asking questions of one another to help develop a poster-pair surrounding the theme of "similarities and/or differences between the two cities".

Several sets of students noticed unexpected and unprompted similarities in the way they defined the word-pairs (and even in some of the images they captured), which helped to establish a shared understanding between partners. In the final phase of the photography project, students incorporated photography from their initial image exchange into a pair of posters exploring the two cities. Each student created a set of A3 posters to visualize the similarities or differences between San Francisco and Dubai while considering how research and dialogue could inform their design process.

Partners also collaborated on a Remix Poster project using critical texts (news articles, essays and prose), exploring themes such as the built and natural environments, immigration issues, and historic perspectives. During the poster "remix" students also wrote personas (based upon different assigned audience demographics) and designed typographic posters in response to assigned texts, which were selected to highlight various cultural nuances and developments in the Arab and Western worlds. Students then swapped InDesign files with their overseas partners, and the partners had an opportunity to "remix" the initial designs by adding, subtracting, and editing a certain number of elements before passing the posters back to the original authors for one last round of design edits. Finally, students incorporated process work, design artefacts, and written reflections into a collaborative process book that recorded and described their experiences and project outcomes. Initiated by the American students, the book files were sent to their Emirati partners to contribute their designs, insights and analyses. The culmination of these smaller books were collated into a single anthology and published.

Three-week cross-cultural design collaboration: Fall 2012

Although collaboration was the primary focus of the Spring 2012 semester, in Fall 2012 the cross-cultural exchange served as a supplement to more typical coursework. This new group

of students participated in a simplified version of the project in an effort to measure whether they would gain similar benefits and skills from a cross-cultural collaboration within a truncated time frame. These students participated in an analogous photography exchange, but with different prompts to drive discussions. As with the Spring 2012 students, they similarly exchanged emails and images and explored culture through simple visual narratives.

The Fall 2012 photography exchange assigned a particular category of print-based design to each team, including identity/branding, posters, environmental/way-finding, and publication/editorial design. Teams looked for examples of how the assigned design categories manifested in their own cities, finding and documenting examples of particular cultural or social significance. In San Francisco, students created brief visual narratives (stories told in five images) concerning their particular area of design and later used the images for a poster project. In Dubai, students created a narrative storyboard based on the design category to understand how formal design principles relate to photographic images. Students were asked to consider the implicit meaning of images as understood by another culture, country, or individual.

Students then shared their complete, unedited sets of at least 20 photos with their partners, who, in turn, attempted to create new visual narratives based on cultural assumptions, perceptions, and denotative/connotative visual information. Each student arranged or juxtaposed five of his/her partner's images, and sent these visual narratives back to the partner, accompanied by a brief written explanation of his/her "guess story". Following this exchange, most partners were able to discuss the interpretations with each other, providing feedback and cultural insights. At the conclusion of the project, students once again incorporated their learning outcomes from the semester-long research and project exchange into a final process book. However, unlike Spring 2012, students worked on the books within their respective classes and did not co-design these chapters with their overseas partners.

Results and analysis of student outcomes

Following both projects, students electively responded to project evaluation prompts to share feedback on the project and learning outcomes. 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 after the conclusion of the project(s). In general, students felt that the exchange of visuals, narratives, and photographs gave them unique insight into the life of their partner, while simultaneously exposing them to the day-to-day lives of another culture. Self-evaluations also revealed that students believed their cultural awareness had increased, while their sensitivity to audience and representation in design terms had improved. Comparing the findings from the Spring and Fall 2012 semesters reveals that, even in shorter doses, this type of design collaboration has merit in both design learning and cross-cultural terms, along with increasing awareness of the participating city contexts.

Analysing the Use of Virtual Communication Tools
Although asynchronous virtual communication allowed students to connect at their own convenience and schedule, both courses were frustrated with the lag in responsiveness afforded by the time difference. The brevity of the Fall exchange amplified the negative response to asynchronous communication, culminating in an overall consensus that the interactions were sporadic and course-based, rather than genuine and relationship-based. The reliance on electronic media for communication— rather than face-to-face meetings —also impacted students' ability to effectively communicate and interpret meaning regarding their partners' culture (Adler & Gundersen, 2008, p. 85). In the survey responses, one Emirati student wrote:

I would like to have partners that are eager to interact, engage and exchange information with. I would also like to have a project that allows us to exchange more work and information where we give each other feedback, ideas and opinions. My partners gave me the impression that they were not that excited about the project as I was (which kind of made me lose the enthusiasm as we moved along...). (Anonymous student, Dubai, Fall 2012)

Even with the challenge of maintaining group motivation and the difficulty in encouraging students to build authentic relationships, the Fall 2012 students recognized the value of the cross-cultural interaction, stating that it demonstrated the benefit of exchanging ideas, meeting deadlines, practicing patience, and working in groups.

Assessing Design Knowledge

In light of the experimental and collaborative nature of the courses, the instructors sought to assess the efficacy of the courses by measuring students' grasp of fundamental design principles and basic design skills. Asking students to evaluate themselves at the conclusion of the term revealed that they were able to meet the specified learning objectives in design while also benefitting from the additional components of cross-cultural communication and awareness.

An evaluation of students' design knowledge before and after the project compared students' preexisting awareness of design knowledge (basic design skills, typography, representation, and audience) to their level of knowledge following the course (figure 4). Both groups of Fall 2012 students from both schools reported a similar perceived average knowledge gain, as did the Spring 2012 students. These findings indicate that the intended learning outcomes of both courses were achieved. Though the Fall 2012 students did not work together as long as the Spring 2012 students and reported lower overall satisfaction with the project, they still reported a significant gain in design knowledge (figures 5 and 6).

Figure 4: Overall design knowledge: Comparing the average gain in design knowledge (basic design skills, typography, representation, and audience) between both courses in both Fall and Spring semesters against the duration of the project indicates that a project with a shorter duration can still result in a measurable impact.
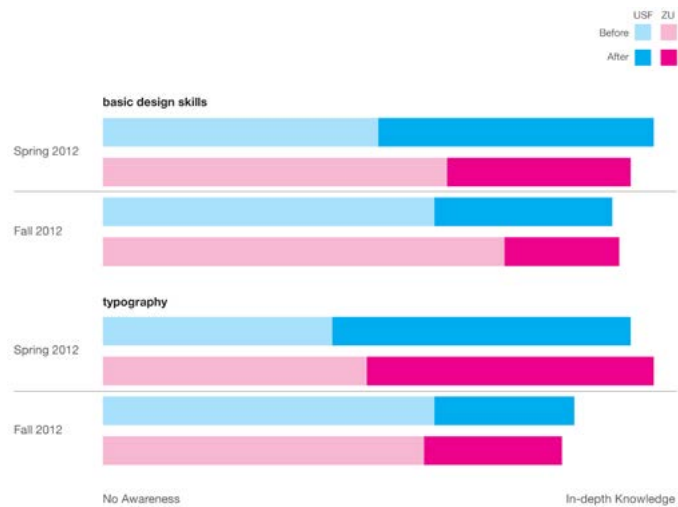
Figure 5: Measuring student knowledge gains in basic design skills and typography between both semesters indicates that both courses' learning objectives were successful.
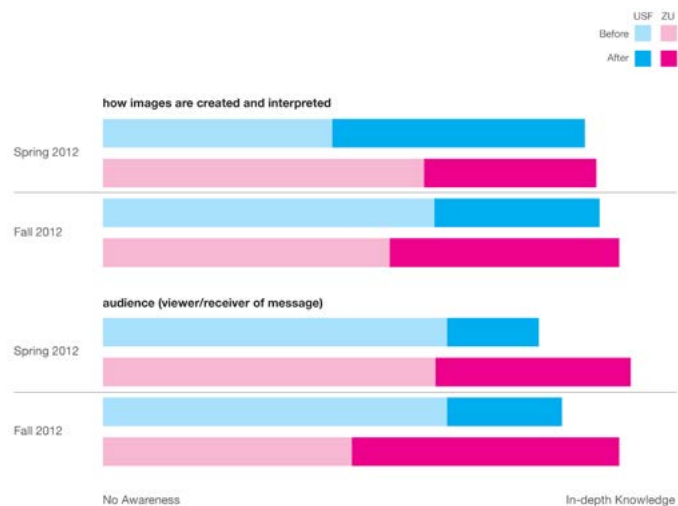

Figure 6: Measuring student knowledge gains in representation and audience between both semesters shows that students' learning outcomes were in line with course goals.

During the Spring 2012 semester, the persona-development component of the Remix Poster assignment represented an important moment in the students' design education: the project allowed them to consider audience in a different way, both locally and on the other side of the world. Through the lens of their various personas, they reconsidered whether their design choices were appropriate, communicative, and relevant. The personas and subsequent layout exchange also helped students educate each other on cultural intricacies, providing windows into their different backgrounds. This round of interactions also made them realize that not all individuals have counterparts in other cultures.

Probably because of its longer duration, the Spring 2012 students reported higher satisfaction with the overall experience through their written reflections, class-critiques, and survey

responses. The design thinking process that included collaborative research, team-based ideation, exchange of visual materials, and co-design all contributed to a rich, well-rounded cross-cultural collaboration. The ability for students to see their photography incorporated into a collage or read their written exchanges transformed into typography on a partner's poster increased their emotional connections to their partners.

It is interesting to note that the students in Dubai generally seemed to struggle with representing San Francisco on a deeper level. Visual responses and interpretations were based primarily on photography and often did not seek to derive deeper meaning from their partners. Perhaps both groups could have asked more of each other to arrive at city posters that had equal meaning and soul; in most cases, simply encouraging students to critique each other's work via email was not productive in this regard.

For students involved in the Fall 2012 semester, lower rates in perceived design improvement likely stemmed from the abbreviated length of the project and confusion about project expectations. Not only did the shortened timeframe decrease opportunities for design exchange and critique to naturally develop between partners, it also generated uncertainty about the nature and purpose of the collaboration. Despite written briefs and guidelines outlining the purpose of the photographic and visual narrative exchange, students initially struggled to see the value in the visual exchange as a tool for improving design sensibilities.

Most students eventually came to appreciate the rare opportunity for cross-cultural exchange, but a few reported that it was "not [the] biggest learning opportunity in the course," (Anonymous quote from San Francisco student survey, Fall 2012). Without the opportunity to share design decisions using collaborative design techniques such as the Remix Poster project, the chance for students to communicate directly through the platform of design seemed almost completely absent from the collective Fall 2012 experience. On the other hand, many of the Fall 2012 students realized, upon project completion, the value of learning collaborative techniques and co-working tools as transferrable skills to various projects and contexts.

Assessing City Knowledge

Adler writes that cross-cultural situations require participants to "assume difference until similarity is proven" in view of the fact that people from different countries see, interpret, evaluate, and act upon events differently (Adler & Gundersen, 2008, p. 72). In course feed-back, students mention feeling "surprised to learn" about similarities between the cities, but never venture to comprehensively explain initial thoughts or feelings of difference. Beyond students' preliminary brainstorming session about the other culture before the start of the project, it seemed they were unwilling to articulate to their partners what might be perceived as unfounded or biased initial assumptions about the "other". At the same time, the students in San Francisco felt shy to ask cultural questions, perhaps from a desire to maintain positive relations with their partners and a fear of overstepping cultural boundaries or protocol.

> I would have liked to learn more about her clothing and traditions but we never really got there in our conversations and I did not want to ask it off the bat. I am so curious about how the girls in Dubai perceived our class...it would be really interesting to see the other side. (Sophie, San Francisco, Spring 2012)

The idea that students had an opportunity to help break down stereotypes and teach others about the similarities between the cities seemed to be a driving force behind a somewhat homogeneous approach. In the Spring 2012 collaboration, first impressions about each city varied greatly between classmates (figure 7), and many students were embarrassed to admit they initially knew nothing about the other culture. Though they ultimately learned that the Burj Khalifa and Golden Gate Bridge are not the only noteworthy aspects of Dubai and San Francisco, most students initially struggled to define their cities beyond the obvious physical characteristics of architecture and environment. Perhaps they were drawn to architecture as a solution because it felt approachable and benign, and seemed relevant from a design standpoint (figure 8).

Figure 7: City knowledge: Evaluation of students' city knowledge before and after the project indicates that students improved their knowledge of their own city as well as the partnering city as a result of the collaboration.
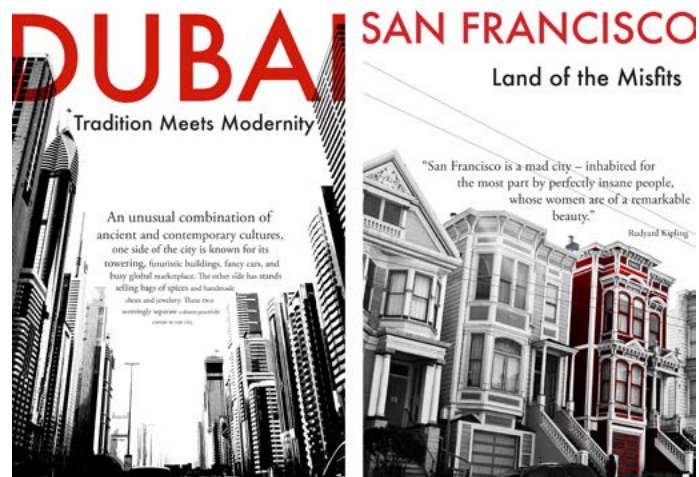

Figure 8: Chloe describes her poster pair: "I feel like my San Francisco and Dubai posters for this project successfully portrayed each city from a classic perspective—Dubai as modern and urban, and San Francisco as diverse and unorthodox. They clearly tied together because of the matching color scheme and bold, obvious titles on each. I also used the text in each to highlight the lines and negative space created by the angles of the buildings in the photographs." (Chloe, San Francisco, Spring 2012)

Prompted by the word-pair of "liberal" and "conservative" and inspired by her partner's interpretation, one American student began to explore how the assumptions of definition could be challenged across cultures. Though, from her American perspective, these terms are typically imbued with specific and divisive meaning, she began to find new ways to contextually define the words' significance:

One of Alia's photos for "liberal" is a shot of several women wearing burqas. They are considered an example of liberal because they are also carrying Western designer bags,

have bright manicured nails, are adorned with western jewelry, and are wearing western attire beneath the burqas. This is extremely fascinating for me, because here in California, designer handbags and expensive jewelry seem more conservative than liberal... (Natalie, San Francisco, Spring 2012)

Figure 9: Natalie describes her poster pair: "I was trying to communicate the idea that, underneath our burqas and/ or hot pants (as the case may be), we are all ultimately people. We feel the same emotions and we share the same basic life experience." (Natalie, San Francisco, Spring 2012)

Students' visual responses overwhelmingly led to poster pairs that focused on cultural similarity rather than difference. This emphasis on similarity emerged concurrently with the idea that the cities were different from one another:

Finding commonalities between Dubai and San Francisco was difficult, but my word pair (large & small) unfolded the commonality of elevated heights. I discovered that albeit different in nature, the two cities have their own great heights that result in expansive views. (Erika, San Francisco, Spring 2012)

Students readily found similarities between the cities in terms of their international fame, architecture, beaches, cultural diversity, and tourism. Still, when attempting to explore differences, discussions between students remained restrained in spite of their assigned word-pairs. Most topics interpreted and defined by the students as differences focused on weather, time zone, architecture, topography, environmental landscape (trees and hills vs. desert and sand), graffiti/public art, clothing, and educational structure (figure 10).

Both cities are concerned with progress, consumer culture, development and tourism. Traffic seems to be a common issue for both cities, although I must say it looks much worse in Dubai! (Hannah, San Francisco, Spring 2012)

Figure 10: Rawdha describes her poster pair: "The differences between Dubai and San Francisco are mainly concerned with what is considered to be 'native' in each of the cities, such as the gelato in San Francisco, and the harees—a type of food—in Dubai." (Rawdha K., Dubai, Spring 2012)

For other students, the process of defining the word-pairs helped reveal deeper levels of understanding. In such cases, the students moved past polite conversation, revealing personal introspection and challenging cultural assumptions. These students not only began to analytically explore the city, but more importantly, develop ideas about its residents (figure 11).

Initially, I didn't understand how there could be a balance between traditional culture and modern American society but...[t]he fact that Rawdha wears the Hijab and European designer clothes at the same time is the epitome of blending cultures in Dubai. (Clare, San Francisco, Spring 2012)

Figure 11: Rabab describes her poster pair: "Regarding culture and social aspects, San Francisco is way more liberal than Dubai is. Dubai is more conservative regarding religion, many things that are accepted in San Francisco are not accepted in the UAE generally." (Rabab, Dubai, Spring 2012)

In terms of an awareness of their own cities, it seems that most of the Fall semester students started with more knowledge of their city and their partners' city than students in the Spring semester. This is probably due to the fact that, in Fall 2012, more of the American students were originally from the San Francisco area and were therefore more familiar with the local culture at the onset of the project (the Spring 2012 participants hailed from locations across the US). Meanwhile, more of the Fall 2012 Emirati students had explored Dubai more extensively (prior to the project) than their Spring 2012 counterparts.

Assessing Cross-Cultural Knowledge

In terms of cross-cultural understanding and challenging students' preconceived notions, the Fall semester students reported greater gains in learning. Though the longer duration of the collaboration in Spring 2012 resulted in more successful design projects, students in Fall 2012 still increased their knowledge and generally considered it a valuable activity, even though it was not the primary focus of the course (figures 12 and 13).
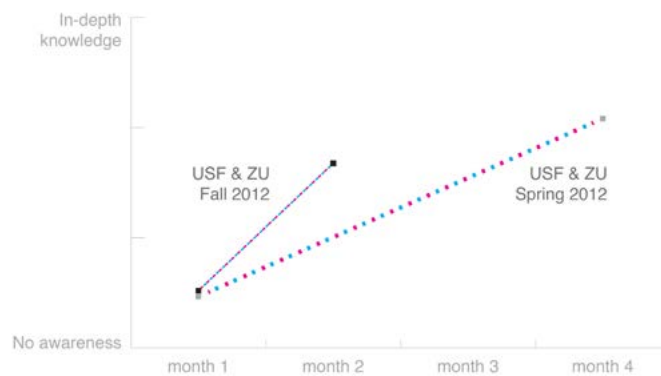

Figure 12: The average of students' perceived cultural knowledge (across all measured categories) before and after the project reveals that students at both universities placed themselves at almost the exact same starting point in terms of pre-project cultural knowledge.
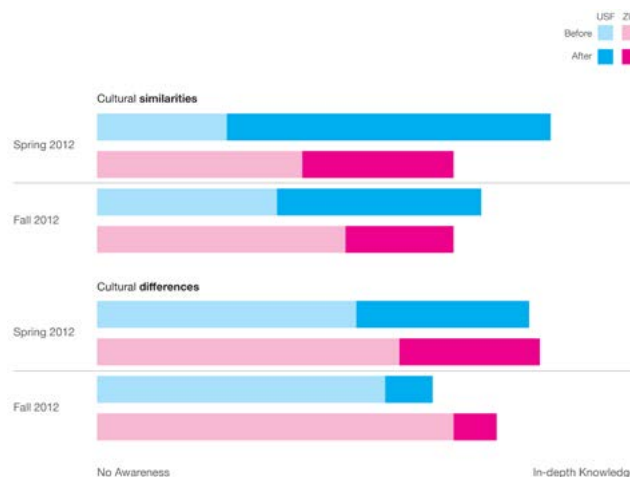

Figure 13: The Fall 2012 students at both schools reported an identical perceived average knowledge gain, as did students from both schools who worked together in Spring 2012. Though the Fall 2012 students did not work together as long as the Spring 2012 students and reported lower overall satisfaction with the project, they still reported a significant gain in cultural knowledge.

In Spring 2012, most students' email conversations seemed to remain at a surface level due to their hesitancy to discuss challenging topics and tendency toward maintaining a safe, almost diplomatic distance from one another. Unlike the Spring 2012 collaboration, Fall 2012 participants began the collaboration by exchanging stories about themselves via email. This not only relieved some inhibitions, but also provided an opportunity for partners to ask each other some cultural questions earlier in their correspondence. Specific discussion prompts from faculty diminished the fear of overstepping perceived cultural boundaries and encouraged students to lower their guards enough to allow for a richer cultural exchange. The exercise also elicited lengthier email responses that involved cultural topics requiring further explanation, prompting students to learn about each other via anecdotes rather than short factual snippets (Sikkema & Niyekawa, 1987, pp. 51-52). As one student shared:

My partner had a lot of great quotes in her emails to me, but my favorite was when I asked her why she didn't show her subject's face in any of her photos. She responded, "Here in UAE almost [all] families do not allow their daughters to put...images that show their faces in the internet because there are lots of compan[ies] or bad boys [who] can use them in unsuitable way[s]. In UAE the girls' reputation should not be harmed or hurt (we are expensive jewelries)." (Jean, San Francisco, quoting her Emirati partner Amna, Fall 2012)

Through design collaboration, students located in Dubai and San Francisco began to realize that personal relationships, gender relationships, and family life influence communication, interaction, and assumptions. For students in the UAE, the influence of religion, for example, plays a dominant role in defining the appropriate use of imagery and photography, particularly within social media. Female Emirati students in Dubai rarely share photographs of themselves on Facebook, blogs, or other social platforms. On the other hand, students in San Francisco freely and abundantly share images of themselves in almost all aspects of their digital lives, so were often confused by the "lack of faces" in photos they received from their Emirati partners. Challenges arose when the two student groups interacted solely through asynchronous virtual platforms. In this case, a perceived barrier was erected for Western students who tried to connect emotionally with their Arab partners without the aid of photographic representations.

The persona-development component of the Remix Poster assignment led to some of the most interesting cultural insights of the entire collaboration. Requiring students to write in detail about their audiences in the form of personas grounded the exchange on a personal level—focusing students on a tangible, shared humanity—which gave rise to discussions that did not emerge in earlier exchanges. Perhaps it is easier to engage in cultural critique in the third person, or to share opinions and preferences through the lens of a fictional character.

Finally, as students worked on their final process book, general discussions began to emerge in the classrooms and between partners about the overall merits of the project, with an overwhelming consensus about the unexpected value of the experience. Students asserted that personal relationships with their partners allowed for greater cultural under-standing, and that the traditional research methods of internet searches and library visits left them unfulfilled and disconnected. Real-world collaborations allowed them to see the other city in a rare light, while helping them rigorously examine their own city and customs:

I never would have learned as much if we had simply been assigned some research—by communicating one on one with Ebtesam I learned about Dubai from a unique, personal perspective. (Chloe, San Francisco, Spring 2012)

...by exchanging photos with an actual San Franciscan you get to see the city from their perspective which was something new to experience, rather than just Googling. (Rodha M., Dubai, Spring 2012)

During both semesters, the use of co-design tools for cross-cultural collaboration resulted in a mutual appreciation for their partners' contributions to their learning experiences and their perceived readiness for participation in a global community. Friendships formed between many of the students, with unprompted efforts to continue dialogues and collaboration outside the confines of the course structure:

> This project has changed my overall outlook on the world. I now have a larger realization that every different culture perceives visual information in different ways that may have similarities...but indeed have a lot of differences. It's been a very eye-opening project... (Jessica, San Francisco, Spring 2012)

> It's an experience that I think is irreplaceable and necessary to grow as a designer.... I start thinking about the various ways my poster can be interpreted not just by classmates, but another culture, an outsider... (Alia, Dubai, Spring 2012)

Conclusions

Both Dubai and San Francisco are examples of incredibly diverse cities, with highly international, multilingual populations representing a full spectrum of cultures and classes. The two cities offer an ideal environment for design teams to explore techniques for increased cultural awareness and audience sensitivity beyond embedded cultural norms. In the Spring and Fall 2012 semesters, geographically distinct teams used design to brave the challenge of cross-cultural communication without the benefits of body language, visual cues, tone of voice, and facial expression to ease communication barriers (Sikkema & Niyekawa, 1987, pp. 25–37). The extreme time difference not only challenged students' patience and commitment to the process, but also led to communication discrepancies. However, student evaluations revealed that the exchange still delivered valuable learning outcomes, including increased cultural awareness.

Even between culturally homogenous designers, communication can be a challenge. The introduction of different languages and cultural backgrounds in cross-cultural communication escalates this complexity. Adler explains that cross-cultural misinterpretation commonly occurs based on four distinct areas that include "subconscious cultural 'blinders', a lack of cultural self-awareness, projected similarity, and parochialism" (Adler & Gundersen, 2008, p. 80). Cross-cultural communication techniques from the field of Management can provide practical approaches to early pitfalls or hesitations during student design exchanges. Educators can introduce some of Adler's communication techniques by encouraging students to "assume difference" until they have evidence of similarities; by placing emphasis on descriptions first before allowing students to interpret things for themselves; by challenging students to see through the eyes of their overseas collaborators (p. 88).

Real-time correspondence could also increase spontaneity and help decrease the burden of maintaining an epistolary relationship, which may feel more permanent and rigid. At the same time, these technologies also bring a new set of questions, requirements and potential problems that must be addressed in preparing students for the assignment (Moldenhauer, 2010, p. 233). Students might appreciate becoming acquainted in a looser, more carefree space, though differences in time zones will always pose a logistical challenge. Additionally, building stronger relationships between partners may help generate a more successful critique environment for both classes. A culminating experience that enables students to interact in person and engage in face-to-face discussions may increase the probability of long-term cross-cultural relationships.

In terms of critique, simply requiring students to evaluate each other's work is too open-ended. Students should be required to thoroughly articulate their concepts to each other, and need a framework for analysing each other's work. During collaborations, it would be useful for students to have a rubric that provides concrete criteria to use in analysing their partners' projects, and helps them reflect on whether or not they achieved specific goals. For this approach, it is vital that students understand that their comments will not affect their partners' grades.

In spite of myriad challenges, both expected and unforeseen, participants from both terms recognized the value of this collaboration. In most cases, even when they felt anxious about swapping files or participating in critiques, realizing their accountability to a partner abroad—in addition to their professor and classmates—made students more attentive, focused and driven in their design work. At the semester's completion, the young designers felt better equipped to take on the challenges of a global profession with broadened perspectives, collaborative techniques, and co-creation tools.

Continuing the experiment in cross-cultural design education

As a continuation of this research and in order to investigate the aforementioned pedagogical modifications, this collaboration will continue in 2014 with amended project parameters. The two participating classes will consist of senior graphic design majors from the Rochester Institute of Technology (RIT) in Rochester, New York, USA and Virginia Commonwealth University in Qatar (VCUQ), located in Doha, Qatar. In addition to their status as upperclassmen (previous collaborations were conducted with beginner-level students, some from disciplines outside of graphic design), the nature of the courses will be different as well: the VCUQ course is named "Design for a Sustainable Future" and encourages a critically-engaged application of design craft and design thinking to current and future societal challenges. At the heart of our investigation is the belief that design can drive considered change in society; as such design can be a powerful driver of action for environmental and humanitarian sustainability. The RIT course, "Advanced Web & Interactive Design", teaches design for user experience through a focus on human-centred research and a systemic view of designed products and services. Because of its inherent complexity, systemic impacts, and inextricable relationship with human emotions and behaviours, sustainability is a natural topic for this course.

Though there is no specified medium for students in the "Design for a Sustainable Future" course, and neither course will dictate a specific form that the students' final projects must take, the course and its collaborative projects will be constructed so that partners in distinct classrooms can work symbiotically to create different design touch-points within the same concept, campaign, or broader service ecology. It is the hope that introducing a complex global theme to upper-level design students will enable them to open up to each other and work more collaboratively and constructively than in previous cross-cultural courses, in which students directly examined similarities and differences pertaining to their individual cultures. A topic of international interest and concern, such as water sustainability, will likely give students neutral—yet fertile—ground upon which to meet, research, discuss, and design. Furthermore, because there is no prescribed form for the projects, students will need to communicate with each other to exchange, discuss and critique ideas and to work together toward compatible and supportive solutions.

Unlike the previous collaborations in which students were paired together as partners or trios by the supervising faculty, these senior-level students will self-select based on mutual interests on chosen topics within the proposed theme of "water sustainability". Finally, both groups of students will have an opportunity to disseminate the fruits of their collaboration with both campus communities. An important part of design is to share the work with a larger audience, and that need is magnified with cross-cultural collaboration.

In exhibiting the results of the cross-cultural exchange, other students and faculty will be exposed to the concept of cross-cultural design and hopefully see the importance and impact of combining intercultural communications with design pedagogy. The intention is to help design students enter the field with knowledge beyond the basic essentials: they should also possess an awareness of the world around them as the greater context of their work. In the midst of constant technological progression, teaching students to approach problems by thinking for themselves and using collaborative and interpersonal skills provides them with durable assets that will extend to their future design practice—and beyond.

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Kelly Murdoch-Kitt /
Rochester Institute
of Technology /
College of Imaging Arts &
Sciences / School of Design /
Department of Graphic Design /
kmmfaa@rit.edu

Kelly Murdoch-Kitt is an Assistant Professor in the Graphic Design program at Rochester Institute of Technology's College of Imaging Arts and Sciences. She teaches and works primarily in the areas of interaction and user-experience design. Kelly's graduate research (which informs her current teaching and scholarship) explores theories of situated learning and experiential elements of virtual communities and their impact on public interest issues. Her interest in design pedagogy informs recent collaborations exploring the socio-cultural benefits of technologically-mediated cross-cultural design education; the advantages of teaching visual literacy concepts to students outside of Design disciplines; and the benefits of integrating sustainability challenges into project-based design courses. Kelly recently presented papers at the 8th International Conference on Design and Emotion at Central Saint Martin's College of Art and Design in London, UK; The 2nd International Conference for Design Education Researchers in Oslo, Norway; and the National University and College Designers Association (UCDA) Design Education Summit in Madison, Wisconsin, USA. Recent publications include "A Visual World Demands Design Sense: Advocating for Visual Communication Across the Curriculum" in *The International Journal of Design Education*, (co-authored with Dr. Kelly Norris Martin, 2013) and "Design Nexus: integrating cross-cultural learning experiences into graphic design education" in *Studies in Material Thinking 11: Re/materialising Design Education Futures* (co-authored with Prof. Denielle Emans, in press, 2014).

Denielle Emans /
Virginia Commonwealth
University in Qatar /
Department of Graphic Design /
djemans@vcu.edu

Denielle Emans is an Assistant Professor in the Graphic Design department at Virginia Commonwealth University in Qatar. She specializes in the area of experiential design in relation to the conceptualization, development, and execution of visual messages for social change and sustainability. Her current academic research further explores design in relation to interdisciplinary collaboration, cross-cultural studies and impact assessment for social design. Denielle recently presented papers at The 2nd International Conference for Design Education Researchers in Oslo, Norway; The 9th DesignEd Asia Conference in Kowloon, Hong Kong; and the 2014 National University and College Designers Association (UCDA) Design Education Summit in Madison, Wisconsin, USA. Recent publications include "Hybrid Learning for Social Design" in *Tasmeem* 2013:3 (co-authored with Prof. Adina Hempel) and "Design Nexus: integrating cross-cultural learning experiences into graphic design education" in *Studies in Material Thinking 11: Re/materialising Design Education Futures* (co-authored with Prof. Kelly Murdoch-Kitt, in press, 2014). Denielle holds a Masters degree in Graphic Design from North Carolina State University, School of Design and a BA in Communications (Media Studies emphasis) from the University of North Carolina, Chapel Hill.