RESEARCH STATEMENT

I am a scholar and designer whose research contributes to the transformation, development and wider impact of the field of design education. My research is deeply connected to my lifelong commitment to racial equity and intercultural learning, and my interest in both visual and virtual communication. As a white woman who grew up in the City of Richmond, Virginia, in the midst of racially and socioeconomically segregated neighborhoods, my positionality prompted discussions of systemic racism and white privilege from a young age. I became attuned to, and passionate about, addressing social and racial inequities through allyship and advocacy. I took courses from home during high school due to a medical condition, in the nascent days of public internet access and used that as an opportunity to mediate my social isolation and supplement my education by forging virtual friendships with people from around the globe. These formative experiences shaped me and my academic interests in design, a discipline that, over the years, has struggled with its relationship to systemic racism and inclusion.

My research extends visual thinking methodologies to improve intercultural communication, collaboration, and learning in design, education, and business. The products of my research and creative practice are twofold: peer-reviewed publications and design products. Both are essential to my ongoing commitment to lead the diversification of design education, research, and practice. Prior to joining the University of Michigan (UM) in 2017, I was on the tenure track at Rochester Institute of Technology for four years. At RIT, I produced 26 peer-reviewed presentations and publications; was co-PI on a $100,000 National Endowment for the Humanities prototyping grant, and received an internal research grant ($5,000). Since joining UM in 2017, I co-authored a peer-reviewed book, *Intercultural Collaboration by Design: Drawing from Differences, Distances, and Disciplines through Visual Thinking* (Routledge, 2020); and co-edited 2 volumes of peer-reviewed conference proceedings: *Dialogue: Proceedings of the Decipher 2018 Design Educators Research Conference* (Michigan Publishing, 2020). I also completed 21 other peer-reviewed publications and presentations, such as book chapters and conference proceedings (most notably the Design Research Society). I am PI on 5 UM research grants, including the MCubed Classic Cube Grant ($60,000) and the UM Office of Research Preliminary Project Grant ($30,000). These grants support two ongoing research collaborations, described later, that leverage my user experience design expertise. The first, *ORBIT: Online Resource for Building Intercultural Teams*, extends the new methodologies and theories articulated in my book to an online platform that supports the formation of new diverse collaborations. I was awarded a competitive 2020 Institute for the Humanities Summer Fellowship at U-M to continue this work. The second, *ManageHF Decision Dashboard,* provides novel real-time support for the complex decision-making processes of health care providers caring for heart failure patients to reduce diagnostic error, increase response speed, and improve face-to-face clinical interactions with patients.

SCHOLARSHIP: INTERCULTURAL COLLABORATION & VISUAL THINKING

My research focus on intercultural collaboration began in 2012. My approach is to develop, test, and refine visual thinking activities that can be used by diverse teams to improve intercultural communication. I show individuals how to work through implicit biases or wider cultural stereotypes and formulate intentional questions which prompt more meaningful dialogue. My framework for collaboration teaches people to visualize abstract concepts such as time differences, project timelines, and roles; and they learn through playful, trust-building activities such as the Picture Story Shuffle, which builds rapport and personal connection between intercultural collaborators while also creating an opportunity to discuss cultural specificities. My partner in this research is Denielle Emans, Associate Professor of Graphic Design at Virginia Commonwealth University (Qatar Campus). The major outcome of this multi-year research is the 292-page peer-reviewed book, *Intercultural Collaboration by Design: Drawing from Differences, Distances, and Disciplines through Visual Thinking* (Routledge, January 2020). We equally conducted the primary research between 2012–2017. Then, I took the lead, identified a publisher, finished the first draft and managed the peer review process. Prof. Emans re-joined me to finalize the manuscript between May 2019–December 2019. Our focus on remote collaboration that engages teams or small groups of people using online or virtual tools has particular contemporary relevance. We used grounded theory to analyze projects with different cohorts of students working in long-distance teams, with members based in North America and the Middle East. We comparatively analyzed all data; examined our findings in reference to existing theories; and utilized both inductive logic and informed practice. Our research results comprised 1) an analysis of the efficacy of visual thinking activities and 2) the development of a new theoretical framework for diverse teams.

We call this new framework *The Six Dimensions of Intercultural Teamwork*. To support collaboration among diverse teammates the framework 1) encourages introspection via exercises like the Teamthink Constellation and Personal and Group Iceberg, 2) provides prompts to start subsequent dialogue, which our research shows builds stronger teams, 3) includes exercises such as the Visual Origin Story, Project Generator, and Goal and Role Tracker that help teammates to view their differences as positive assets. *The Six Dimensions of Intercultural Teamwork* are transferable, and we use language that makes the theories and activities accessible to collaborators from various backgrounds and competency levels.

The book and this framework have already been employed in national classrooms (Iowa State University and California College of the Arts) and by businesses who have invited me to present this research. These include global employees of Google's gTech team working in virtual environments; teachers at Natomas Charter School, CA to enhance collaboration among middle schoolers in hybrid learning contexts; and organizations such as CultureSource, serving 100+ cultural organizations across Southeast Michigan, to cultivate new partnerships during this new era of online collaboration. Designing optimal collaborative experiences for diverse teams is particularly pressing in this moment when the need to create inclusive and resilient plans is paramount for educational continuity at all levels. I argue that this serious goal can be reached in part playfully, as seen in conference presentations like the MODE: Motion Design Education Summit, where I presented "Cultural Interplay: Creating Interactive Experiences Through Collaborative Video" (2019).

In parallel to completing my book, I co-edited with Omar Sosa-Tzec *Dialogue: Proceedings of the Decipher 2018 Design Educators Research Conference,* a two-volume conference proceedings which include over 200 authors. Dr. Sosa-Tzec and I coordinated the initial reviews on abstracts together, and I took the lead on working with the authors to finalize paper submissions after the conference, coordinated the second round of reviewers, and interfaced with Michigan Publishing and the copyeditors. I co-designed the proceedings with the help of 2019 Stamps alumna Anna Herscher. As a design scholar who is committed to accessibility and inclusion, offering the proceedings in multiple formats was important to me. I actively participated in making this publication widely available and accessible by negotiating both an online, open-access version as well as a print-on-demand version, which is forthcoming. *Dialogue* is the first ongoing series of published proceedings of the AIGA DEC Conferences. These two volumes are another outcome of my commitment to diversifying design practice and scholarship.

In other publications, such as "Connective Methodologies: Visual Communication Design and Sustainability in Higher Education," published in the *Springer Handbook of Sustainability and Social Science Research* (2018), I argue that international and diverse teams are essential as designers and non-designers unite across disciplines to address wicked problems. My findings suggest an approach to innovation that integrates remote and collaborative methods, like Datastorming and Creative Remixing, into teamwork. These approaches enable diverse teams to show, share, and integrate diverse perspectives into the design process, and help designers to see a problem holistically. Developing a holistic perspective enables designers to understand the complexity of a problem, and to see how their ideas and interventions might affect a system at different levels. It encourages thinking beyond "problem-solving" and instead aims for further-reaching ripple-effect changes. It also helps designers to understand the interconnectedness of stakeholders so that they can be more meaningfully involved as partners in the design process.

DESIGN PRACTICE

In keeping with my dual focus on the scholarship and processes of design I have used theories and methods from the book to support design practice, or research through design, which is the second element of my research activity. My current design practice builds on experiences gained on the 2015 NEH-funded "Lost and Found: Promoting Religious Literacies through Gaming," that culminated in a tabletop card game published in 2017 by Magic Spell Studios. Here, I focus on two current UM-funded user experience design projects: a platform called *ORBIT* and a Manage Heart Failure Dashboard.

ORBIT: ONLINE RESOURCE FOR BUILDING INTERCULTURAL TEAMS is an online platform to facilitate new collaborations. The primary setting for the use of this collaboration platform is currently the higher education environment. By facilitating the process of matching faculty with potential international teaching and research partners, this platform addresses a common problem for faculty who pursue collaborative online intercultural learning (COIL): the difficulty in identifying international teaching partners (current phase), and forming effective diverse teams across classes (next phase). To create solutions I brought

together an intergenerational project team from a variety of cultural and disciplinary backgrounds that includes Bruna Oewel (Stamps MDes 2019); Abigail Ziemkowski (Stamps BFA 2020); Sunsae' Davis (Master's in Management, 2020); Anusha Bohra (Computer Science, 2022); Medha Sripada (Computer Science, 2022); Flannery O'Donnell (School of Information, 2021).

We launched a beta version in July 2020 (**www.orbit-teams.com**) to facilitate faculty seeking teaching or research collaborations by giving them a platform to create profiles, post ideas for teaching or research collaborations, and connect via email. These are the basic functionalities needed (in UX terms, the minimum viable product, or MVP) to create a foundation upon which we can build additional tools such as a digital version of the Teamthink Constellation that helps individuals understand their own working preferences also helps teammates understand each other's differences when comparing results. *ORBIT* is a long-term, multi-phase user experience design and research project. Our team iteratively designs, tests, launches, and refines tools within this platform.

I lead a second team to deliver additional functionality to support teams collaborating remotely on a project. I am building on my track record of winning internal grants to submit an external grant proposal to the Spencer Foundation to support research that tests new features of this research, such as the Teamthink Constellation for use in forming secondary student teams (ages 11–14) with teachers. We will use a user-centered design research methodology which examines target users' motivations and needs as a basis for organizing website content and functionality. Survey data, interviews with potential users (students and teachers), and analysis of their preferred tools and work habits inform the way we create tools to help teachers form teams of students to engage in hybrid project-based learning, and which methods from my book, such as the Teamthink Constellation would best support the progress of the progress and success of these teams in the new reality of a hybrid learning environment. We will use the HEART Framework (Happiness, Engagement, Adoption, Retention, Task Success) to assess behavioral as well as attitudinal metrics on a large scale (Rodden, Hutchinson, and Fu 2010) and the Buck Institute for Education's PBLWorks rubrics (Project Based Learning) to assess efficacy.

We will begin Phase 2 by co-designing with teachers and administrators within a secondary school in Northern California, chosen because of its racially, socioeconomically, and educationally diverse population of learners and their access to technology, which present an optimal opportunity for our project to facilitate meaningful remote collaboration across teams of very different students within the same school. This location was chosen because it is a public charter school, and therefore its somewhat autonomous position makes the school more flexible and able to adopt and introduce experimental tools and curricula; additionally, the school had already collected survey feedback from students, parents, and teachers, and results from all three groups indicated that there was a greater need for resilient forms of collaborative learning and meaningful peer-to-peer contact that would withstand shifts in teaching environments. Each subsequent phase will include additional schools with differing demographics, for example Detroit, Michigan and Helena, Montana. Subsequent phases (3–5) will increase the scope of use for the portal, assessing and improving the ability to support collaboration across increasingly diverse teams of students. The research team expects that the increased range of collaborative teams will allow learners to engage in greater intercultural exchange and address global challenges in their work together.

MANAGEHF DECISION DASHBOARD is an interface that will be embedded and accessible within an existing electronic health record (EHR) system and will give health care providers a consolidated and more visual view of patient data in order to simplify and accelerate their clinical decision-making for heart failure patients. In the United States heart failure is the most common hospital discharge diagnosis among older adults. Due to their complexity and high readmission rate, the management of HF cases must evolve. To address this issue I have worked for a number of years as Co-PI on a collaborative research with two additional Co-PIs, Dr. Michael Dorsch, College of Pharmacy, and, Dr. Scott Hummel, Cardiology. We manage an intergenerational team which has included two faculty consultants from UM's Schools of Information and Health Policy; four undergraduate students and five graduate student researchers in Art & Design, Public Health, and Information Science. In this project, we design primarily for health care providers involved in the complex care of health care patients, including cardiologists, general practitioners, nurses, physician's assistants, and pharmacists.

I focused on the user experience (UX), to improve how these providers interact with and use the interface to inform patient care. This is important because our research revealed that providers caring for heart failure patients must spend a large amount of time reviewing data from multiple online records across several different software systems in order to make adequate decisions about patient care. Their interactions with the system take place before, during, and after clinical interactions with patients. We saw an opportunity to streamline this experience for providers in order to help them more efficiently get the information they need to make decisions for patient care. Our new interface aggregates laboratory results, vital signs, and notes for one patient into one visual dashboard that also shows important information (such as recurring lab results) along a timeline.

By using a mixed-methods approach to design and evaluate the *ManageHF Decision Dashboard,* including ethnographic methods such as contextual observation along with participatory design, our team has discovered key pain points of the current EHR. We conducted a participatory design charrette in Fall 2019 with health care providers who care for heart failure patients. They discussed pain points of their current EHR use and used provided kits of paper prototyping materials to create their ideal patient information interface. Through analyzing audio and video of participants discussing their interfaces after the session, the design team better understood clinicians' needs in context and created an improved user task flow. Examples of pain points with the current EHR include slower provider response to clinical worsening; less attention to patients (more attention to EHR) during consultation; difficulty finding necessary information; and seeing different sets of information depending on the provider. Taking into account all of this data, we created a mental model of current EHR use (Young, 2008). The UX of the new dashboard includes improving visual hierarchy, for example by showing test results and vital sign records against a prominent visual timeline. By reducing the time needed to consult electronic records during clinical consultations, we hypothesize that the more efficient UX will enable more focus on the patient during consultation. We are currently usability testing interface prototypes with clinicians prior to the fall 2020 launch of the beta dashboard. A paper and poster on our research approach will be published later this year in the Proceedings of the 2020 American Medical Informatics Association (AMIA) National Symposium.

As a co-PI on this project, which is one of U-M's "MCubed" funded interdisciplinary initiatives, I have many roles. I oversee and deliver qualitative research, insights, and user interface designs by utilizing human-centered design (HCD) methods, which involve "generating solutions to problems and opportunities through the act of making 'something' new, where the activity is driven by the needs, desires and context of the people for whom we design" (LUMA Institute, 2012)." I have facilitated the visual development of the interface by engaging multiple students from 2018–present. As with the *ORBIT* project, I hired several undergraduate and graduate design students to work on this project. My work with them goes beyond close supervision to mentoring which is integral to my approach to bring together research and teaching. I extend this guidance to students from other disciplines who are working on the project, and, in the spirit of co-design I have taught project participants about HCD and user experience design research methods so that they could become actively involved in the research process. To this end, I have sought out opportunities such as U-M's student research initiative, UROP (Undergraduate Research Opportunity Program) to provide opportunities to multiple students from Stamps and other UM schools to be involved in interdisciplinary research with high-stakes outcomes.

FUTURE WORK

While on the tenure track I have established my expertise in intercultural collaboration in the design education community, as evidenced through the publication of my book, the dissemination of my research via conference papers, and the sustained collaborative research described in the two design projects. That research could have policy-level impacts in terms of changing requirements for curricula to incorporate collaboration and project-based learning as a route to building equitable classrooms—and communities. To facilitate this, I am currently working on an external grant (described earlier), devoted to an ambitious collaboration with experts inside and outside of U-M.

My five-year plan includes seeking opportunities for my work to have a more sustained and systemic impact, specifically by using my methods to cultivate intergroup collaboration and critical pedagogy among public secondary-school students. As much as the physical redlining of the 1930s is still evident in American cities, digital redlining is also a reality that designers everywhere have a responsibility to address. This challenges me to think further about what inclusive user experience design really means. I want to be part of this conversation at the national and international level, help to position Stamps as the place where we develop this expertise and commitment, and continue to design the changes I want to see in the world.