

A woman with dark hair tied back, wearing large circular earrings with a palm tree design, is focused on a craft project. She is holding a red beaded string. A young child with dark hair, wearing a pink shirt, is also working on the project. The child has a tattoo on their arm and is holding a blue container. The background features several potted plants, including a large green one with long leaves. The scene is brightly lit, suggesting an indoor setting with natural light.

HEART Collaboratory: Honouring Equity in Applied Research and Technology

Dr Alexandrina Agloro
Dr Shamsnaz Virani Bhada

HEART COLLABORATORY: HONOURING EQUITY IN APPLIED RESEARCH AND TECHNOLOGY

Traditionally, research and technology development are top-down processes, which do not closely consider the needs of study participants or potential users. **Dr Alexandrina Agloro** at Arizona State University and **Dr Shamsnaz Virani Bhada** at Worcester Polytechnic Institute have recently created the HEART Collaboratory. This collaboration conducts community-based research that closely considers the needs, humanity and culture of all stakeholders and study participants.

Community-based Research

Many research practices in science and engineering often disregarded the needs of potential beneficiaries, communities, study participants, or other stakeholders. Without considering the views of all stakeholders, researchers can sometimes glide over important factors, resulting in superficial data or technologies that do not meet the needs of their users. In addition, a lack of community involvement can reduce users' trust in science and technology, making them less willing to support scientific research.

Dr Alexandrina Agloro of Arizona State University, and Dr Shamsnaz Virani Bhada of Worcester Polytechnic Institute have been developing ways to increase the trust of communities in engineering and science, by employing research practices that are human, engaging, and trust-building.

Coming from a background in systems engineering, Dr Bhada is well-acquainted with the shortcomings of existing research and development practices. Dr Agloro's expertise is in interactive media design and community-based research methods.

Together, they created the HEART (Honouring Equity in Applied Research and Technology) Collaboratory, a collaboration aimed at conducting research that closely considers the needs of study participants and research-relevant communities.

'When you approach research thoughtfully and approach communities at their speed, thinking about consent and community needs before you start thinking about funding, timelines, and deadlines, the data that you get is much richer and you can learn a whole lot more,' says Dr Agloro. 'Our aim is to work hand-in-hand with our stakeholder, as opposed to employing a top-down approach and making assumptions about what our stakeholder needs.'

A Unique Research Methodology

The studies conducted by the HEART Collaboratory are based on a unique methodology designed to make communities involved in research feel at ease – building a relationship with them that is based on trust, humanity, and understanding. 'In the past century, we've had massive expansion of the military and industrial sectors using systems engineering methods and



tools,' says Dr Bhada. 'But at the same time, we have lost track of the human infrastructure that can benefit from the tools that we have perfected in the last century. So, I think our work can have a great human impact.'

Before they start collecting their data, Dr Agloro and Dr Bhada build a rapport with study participants, to ensure that they feel heard, acknowledged, and respected. Their research methodology also honours culture and ancestry, considering the possibility that participants come with their own cultural backgrounds and historical trauma. Moreover, it highlights the shared humanity between researchers and participants, through group healing practices and the open sharing of experiences.

‘We use stories as a vessel to connect with participants,’ says Dr Bhada. ‘Typically, when conducting research with human subjects, one just hands out a piece of paper and collects relevant data. Our approach is more holistic and includes whole person wellness including meals, childcare, and necessary language translation.’

Technology Use Among Birth Workers

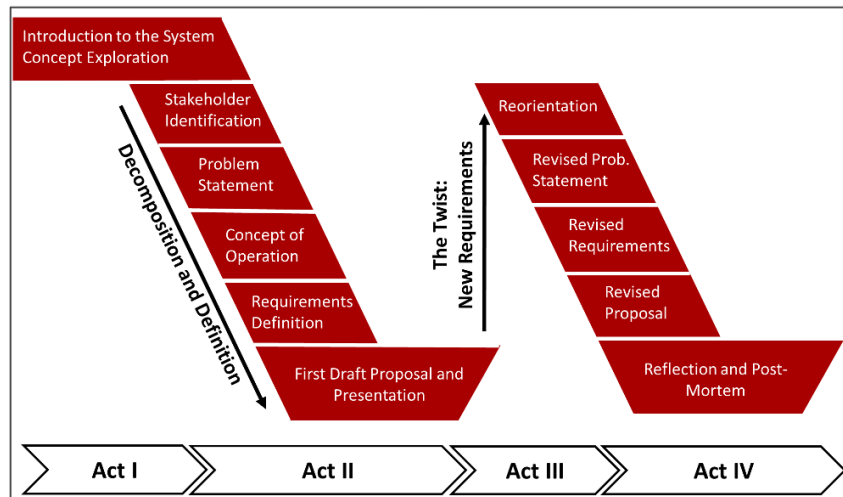
Dr Agloro is a certified doula and birth practitioner, so she has extensive experience in assisting women during birth and is aware of the current shortcomings in the collection of birth-related data. In Los Angeles County, for instance, only a single survey has so far examined birthing outcomes: the Los Angeles Mommy and Baby (LAMB) survey. The data gathered by this survey guides decision-making, affecting how birth-related resources are allocated to different communities and informing the development of strategies to cope with perinatal issues.

LAMB survey data might not be fully inclusive, as its recent survey only collected responses from 6.8% of the 13.1% African American women who gave birth in Long Beach, yet it included responses from 18.6% of the 19.2% white women who gave birth in the same area, over the same period.

‘African Americans in LA County have the highest levels of housing insecurity of any group,’ says Dr Agloro. ‘Maternal mortality is at a catastrophic level and black women are more than three times as likely to die from pregnancy-related complications than white women, while Indigenous women are twice as likely.’

To reduce disparities in birth-data, the HEART Collaboratory recently carried out a community-based study exploring how technology could help collect more representative data in Long Beach, by approaching a community-based doula collective that supports African American birthing people.

To ensure that their data fully reflected the needs and views of the birth workers



Converting systems design process into four acts of the alternative reality game.

they interviewed, Dr Agloro and Dr Bhada firstly built a relationship with them. Their first interactions with the doulas included a somatic healing workshop, during which participants were led through self-massage exercises and a story circle to learn their interactions with technology in which many participants incorporated their birth stories.

‘We became vulnerable in the workshops by sharing our own personal and birthing stories,’ says Dr Bhada. ‘In contrast, over my past ten years of engineering research, I found that 90% of the time human subjects are treated as data collection mechanisms and their humanity is not fully considered.’

Alternate Reality Games in Education

A second study conducted by the HEART Collaboratory examined the potential of alternate reality games as a tool to educate systems engineers. These games combine online and offline puzzles, challenges, and problems, encouraging players to merge their gaming experience with their own real-life experiences.

Early in their partnership, Dr Agloro designed a game for one of Dr Bhada’s Systems Engineering classes. The objective of this game was to help students to better understand how their unconscious biases and pre-conceived notions about society might adversely

influence their system design processes. The game presented players with scenarios in which there was a campus security threat, which was later revealed to be related to gender-related violence. After they played the game, students were asked to complete two surveys and an essay reflecting on their experience. In addition, they took part in an open and engaging discussion about their assumptions and how these assumptions may affect their work as engineers.

A Human Approach

The initial studies conducted by the HEART Collaboratory confirm the benefits of community-based research practices, as their study participants provided rich, honest, and in-depth feedback. In addition, Dr Agloro and Dr Bhada felt that they built a human connection with their study participants, which positively affected the quality of the data they collected.

The researchers hope that their work will inspire more teams worldwide to take the needs and opinions of stakeholders, users, and study participants into account when conducting research or creating new technologies. Meanwhile, the HEART Collaboratory plans to continue bridging the gap between communities and technical innovation, conducting more studies using their human-centred methodology.



Meet the researchers

Dr Alexandrina Agloro
Arizona State University
Tempe, AZ
USA

Dr Shamsnaz Virani Bhada
Worcester Polytechnic Institute
Worcester, MA
USA

Dr Alexandrina Agloro is a media artist and an assistant professor of Science, Technology, and Innovation in the Borderlands at Arizona State University. She holds a PhD and an MA in Communication from the University of Southern California, an MA in Ethnic Studies from San Francisco State University and a BA in Public and Private Sector Organisation from Brown University. Dr Agloro is also a certified birth worker, doula, and yoga teacher. Her areas of interest include community-based research, game design, reproductive justice, critical mixed-race studies, civic engagement, decolonial/postcolonial theories, and the ethical implications of information.

CONTACT

E: aaglor@asu.edu

W: <http://www.agloro.org/>

CONTACT

E: ssvirani@wpi.edu

W: <https://wp.wpi.edu/smerl/>

FUNDING

National Science Foundation (NSF)
Teagle Foundation
Ford Foundation



ASU Arizona State University



WPI