



# Gendered Design in STEAM Bulletin



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Gendered Design in STEAM Bulletin Issue Six | November, 2022



# Foreword

It is my pleasure as the GDS Program Coordinator to bring to you the final issue of the GDS Bulletin.

In this last issue we hear from our esteemed Principal Investigators, Bjarki Hallgrímsson and Dominique Marshall and our GDS Investigator Chiara Del Gaudio, as they share their closing thoughts presented at our closing event.

We remind ourselves of the goals of the GDS Program and summarize our key milestones and activities, as we look over the timeline and what we have achieved during the past three and a half years.

Our research teams are each featured showcasing some of their main activities, methods, outputs and outcomes. You can read more about the projects on our [GDS website](#).

Extracts from an interview conducted with colleagues from IDRC summarizes their early thinking behind the development of the GDS Program.

We hear from our Regional Experts, Sector Experts and Research Assistant Coordinators and Research Assistants on their reflections and experiences from being part of the GDS Program journey. We also hear from the current Program Officer from IDRC on their insights and review of the Program.

We know that the work of our awarded research teams does not end with the closing of the GDS Program, and this, for many, is only the start.

I hope you enjoy this final issue, celebrate its achievements and discover something new about Gendered Design in STEAM.



Kerry Grace | GDS Program Coordinator and editor of the GDS Bulletin. Kerry joined Carleton University on the GDS Program after arriving in Canada as a permanent resident a couple of months previously. Kerry has 14 years experience of working in policing research for the U.K. government, and managing research projects at various levels including producing national statistics for England and Wales.

**Kerry Grace** | Program Coordinator

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GenderedDesign STEAM

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## OPENING MESSAGES & ACKNOWLEDGEMENTS

We start the last Bulletin with a message from the two Principal Investigators of the GDS Program and the GDS Investigator, and share some acknowledgments.

### Bjarki Hallgrímsson | PI GDS Program

"Our GDS Program closing event on Tuesday 4 October was a celebration. Our Carleton University Research Assistants worked hard to produce a [series of short videos](#) for the event. What is so exciting about the videos is that they bring the GDS projects to life. We can see the communities that were involved in the research projects reflect, move about, and hear the researchers' voices and communities. We can see tangible outcomes, be they community events, new prototypes and or new technological solutions, all based on data gathered with the help of a gendered perspective.

The 20 mini documentaries and the information presented in this special issue, show the variety of ways by which the project teams accomplished the goal of making more visible the gendered challenges that arise in the design of technologies, be they renewable forms of energy, transportation or built environment for example. We can see how the second goal of creating a community of practice has emerged from workshops and participatory design.

*"Prototyping has evolved to be a method of iterative thinking that allows problems to emerge and evolve and a gendered perspective offers a particularly fertile way for the various disciplines to work together."*

As for the final goal of testing how design methods of gendered innovations can support research, a lot has been learnt. We note for example that some of project team members are designers and architects by profession, but there are other teams that are mainly composed of engineers and scientists or social science scholars. What we see here is that in all cases the design methods employed were useful to engage with local populations and to allow the work to be more people focused. Prototyping has evolved to be a method of iterative thinking that allows problems to emerge and evolve and a gendered perspective offers a particularly fertile way for the various disciplines to work together. This is truly remarkable to us.



Bjarki Hallgrímsson | Associate Professor in the School of Industrial Design at Carleton University and one of the two PIs leading the GDS Program. Expertise in community-based design with prototyping focus, design history, physical prototyping methods and technologies and prototyping methods.

It has been an awarding and humbling experience to work with the 20 projects spread out over the world. The enthusiasm shown by our colleagues in Africa, Latin America and Asia is clearly indicative of how important community-oriented STEAM work with a focus on Gender is. This program has not only mobilized a strong collaboration between academics and communities in the Northern and Southern hemispheres alone; it has created an opportunity for researchers across the Carleton campus to work together with a common goal and for students to do truly interdisciplinary work across four Faculties.

On a personal note, as a scholar on prototyping methodology, this Program has helped me expand my own understanding of what prototyping is and can be. I also found it incredibly exciting to see the team's openness to exploration and the willingness to expand their iterative work. This has for me been a very interesting aspect."

### Dominique Marshall | PI GDS Program

"I am one of the two Principal Investigators of the GDS Program. I am a Historian at Carleton University.

We can honestly say that this program has exceeded our expectations, especially given the extremely challenging set of circumstances imposed upon a program of this nature by the pandemic. What we have seen throughout the projects is a high level of enthusiasm and mobilization. Regardless of the obstacles, the project teams pivoted and thanks to the extra time given to conduct activities, we now see some truly interesting and insightful outcomes and findings. This paves the way for future work in this new and emerging research field of Gendered Design in STEAM.

From where we stand, the program had to accomplish three overarching goals:

- The first was to make gendered challenges that arise in the design of technologies more visible to researchers, designers, and innovators alike.
- The second goal was to identify, make visible, expand, and enhance the global community of experts and innovators in gendered innovations.
- The third goal was to test how design methods could support research on the topic of gendered innovations among LMIC researchers.

It became clear to us at the onset that we were working at what is called the 'cutting edge of complexity'. As you all know your projects span many disciplinary backgrounds, sectors of application and socio-cultural contexts. What we all have in common are the goals we just stated, and that has allowed us to move forward together in an exploratory fashion and with a willingness to collaborate and work together not only with the expanded involvement of local communities of women, but as an international community of diverse scholars with common goals and objectives. We as a core team have studied this as an especially rich form of transdisciplinary work.

*"We tried to keep the definitions of 'gender' and of 'design' wide open from the start and watched how university colleagues handled these notions across disciplines, geographical areas, together with the extraordinary local communities with whom they partnered."*



Dominique Marshall | Professor of History in the Faculty of Arts and Social Sciences at Carleton University and one of the two PIs leading the GDS Program. She teaches and researches the past of social policy, children's rights, humanitarian aid, refugees, disability and technology.

We tried to keep the definitions of 'gender' and of 'design' wide open from the start and watched how university colleagues handled these notions across disciplines, geographical areas, together with the extraordinary local communities with whom they partnered.

As the historian of the project, I was honored to document the transformation of this adventure over time, using oral history interviews, as well as a digital portal and depository which will help archive the projects' findings. Out of these three years of work with a team of so many parts, I have learned to think differently about creative and respectful ways of making things, and about the worlds of existing knowledge and possibilities that open in a community when allied researchers start taking gender seriously."

### Chiara Del Gaudio | GDS Investigator

"Three years and a half, or a bit more, after the beginning of this project, I have started understanding the learnings, the legacies, and the key dynamics that have characterized the GDS program. When we started, on the one hand, we had a lot of ideas about what more gender-inclusive design practices could be and on how to conduct the program. On the other hand, we were not sure about the type of response we were to receive from the research community.

Now that we are at the end, the variety of projects and their outcomes shows us the vastness of the field of Gendered Design in terms of topics, areas, and needs. On this, even if we were already aware of this, the possibility of bringing together and facilitating interactions and exchanges between cohorts of researchers from three different regions stressed the role of local culture on identified topics and approaches. 'Gendered Design', clearly, cannot be labeled and is never done. It is an expression that welcomes infinite local undertones that will constantly enrich our reflections and doing.

In addition, it seems to me that the local differences and the diversity that have characterized the program, have also engaged us all in sharing and exchanging, notwithstanding the challenges we faced over the last two years.

*"If, at the beginning, disciplinary barriers and potential misunderstanding concerned us as a team, throughout the process, I noticed how the topic of gender itself supported us in overcoming them."*

How do they understand the relationship between gender and design? What is relevant there at this moment? And why? What makes it different from what we need here? I wonder if these are the questions that have passed through the minds of the researchers, let them appreciate the diversity of outcomes and approaches, and challenged them and us in our definitions and practices. They were, for sure, mine.

If, at the beginning, disciplinary barriers and potential misunderstanding concerned us as a team, throughout the process, I noticed how the topic of gender itself supported us in overcoming them. Everybody was engaged in learning from each other. Ready to listen, explore, and experiment with something new to gather the tools to address key

challenges. On this, the relevance of a multidisciplinary team for transdisciplinary knowledge production emerged. This was a key choice.

Finally, across regions, topics and disciplines, participation in the research and design process as a methodological principle emerged as the key word for more gender-inclusive design practices. The engagement of affected people and the creative ways researchers developed for allowing it, showed us what is relevant in academic research and raised key questions on academic knowledge and our role as researchers."



Chiara Del Gaudio | Assistant Professor, School of Industrial Design. Master Coordinator for Master of Design. Her work focuses on design as a political process, power and conflict within design processes, and explores the possibilities for design processes for selfdetermination. Her practice embraces participatory and collaborative design approaches, strategic and speculative design.

### Acknowledgements

"Thank you, Kerry, the GDS indefatigable program coordinator and face of the program for many of the project teams, for all the work you have done throughout.

On behalf of the Regional Experts, Sector Experts and the Core Team we wish to thank:

Beth Robertson, who was the Project Coordinator for the first 13 months of the program until the completion of the Call process.

Claire Thompson and Luc Mougeot of IDRC for being the originators of the idea for this program and supporting it through thick and thin.

Also thank you to Katie Bryant and Anne Weston of IDRC, for helping us in the final period of the GDS program and for providing smooth transitional support.

Heloise Emdon from Carleton's research office, for your research expertise and logistical support right from the start.

"My time on GDS Program since March 2020 has been a journey that I am grateful to have been part of. I would like to take this opportunity to share my own thanks as I bring this Special Issue of the GDS Bulletin to a close:

Firstly, to Bjarki and Dominique – for offering me my first job after recently arriving in Canada, for trusting me with this position and having faith in my ability to help deliver the GDS Program for them and mostly for all their support and patience over the past two and a half years which have been some of my most challenging personally.

And not forgetting Heloise Emdon who recommended me for this role in the first instance. And to Asli Eran for helping me with creating and managing the sub-award contracts.

To Chiara who has been a wonderful colleague and friend to work with, always providing sound advice.

It has been a pleasure to work with our Regional Experts, Raquel, Emmanuel and Yoko. And getting to work with various RAs from many disciplines over the course of the Program and my colleagues, past and present, from IDRC.

Thank you to all the Carleton Faculty Deans who provided the funds to hire 15 graduate Research Assistants to help the Sector Experts in our program.

A big thanks to the many Research Assistants that have been integral to the Carleton Team and who helped prepare the videos watched at the closing event and are available on our GDS website along with the project posters.

We thank all the project teams for the opportunity to work with them on their interesting projects. We have learned so much and have found it so inspiring. Thank you all.

The GDS Program closed October 2022 but let us all watch in what direction and how the relationships that emerged from this program will develop."

**Bjarki Hallgrímsson and Dominique Marshall**  
| Pls GDS Program

To Maya, Ona and Amie, our Research Assistant Coordinators for all their help with organizing the GDS activities and supporting the RAs through various tasks. And particularly Maya who has dealt with my many demands when producing the GDS Bulletin.

To David Zapata who helped towards the end of the program to produce the final edits to the project videos and created some great visuals for our GDS identity seen on our [website](#) and [Instagram](#).

And lastly, I would like to thank all the project leaders and team members. It has been an honour to play a small part in supporting your research journey. You have been doing all the hard work and I've enjoyed helping you where I can and seeing your work progress and develop. Thank you for your patience as I've worked my way through our journey together. It has been a joy to communicate with you and get to know you. I wish you all the very best for all your future endeavours. Congratulations on all your achievements."

**Kerry Grace** | GDS Program Coordinator

# JOURNEY OF THE GDS PROGRAM

The GDS Program started in April 2019 and came to an end in October 2022. It was funded by the International Development Research Centre (IDRC) and was centrally managed and coordinated by Carleton University. We take a look at the background to the research, its objectives, the research problem, the main outcomes and the structure of the GDS Program. We also review a timeline of the key activities that have taken place since inception.

## Introduction

The general goals of the Gendered Design in STEAM (GDS) Program were to contribute to more inclusive technological designs in science, technology, engineering, the arts, and mathematics (STEAM), by building capacity for gendered innovations. These were rediscovered, improved, or new processes or products, designed using gender analysis, with the potential to generate substantial benefits for society, as they advance gender equality. The Program supported a group of scholars and innovators engaged in gendered design, strengthening, or creating networks of professionals and communities, particularly in lower- and middle-income countries (LMICs). The Program was structured to foster mutual learning and long-lasting partnerships among institutions of higher learning in LMICs and Canada.

Responding to gaps in gendered design and innovation research, and at the direction of IDRC, the lead researchers identified **three goals** that the GDS Program seeks to achieve:

1. connect, expand and enhance the community of experts and innovators in gendered design, particularly in LMICs;
2. support LMIC researchers in conducting research and case studies of current and past gendered innovations, and in designing gendered projects for the future, driven by local interests; and
3. make the challenges brought by gender in the design of technologies and processes, more visible to researchers, designers, and innovators, particularly in LMICs.

Carleton University in Ottawa, Ontario, in close collaboration with multidisciplinary experts in LMICs and Canada, coordinated the four primary activities:

- to manage a call for research projects examining case studies on current and past gendered
- innovations, as well as a call for projects exploring

### The overall objective of the GDS Program:

To build capacity for research, design and dissemination of gendered innovations in Science, Technology, Engineering, the Arts and Mathematics (STEAM), addressing challenges predominantly faced by women in low- and middle-income countries (LMICs)

gendered design process and prototyping gendered design outcomes;

- to deliver relevant training and mentoring to LMIC researchers;
- to facilitate and support regional activities in and from LMICs; and
- to facilitate and support the dissemination of the research project results and outputs.

The activities of the GDS Program can be summarized as follows for each year. A detailed description of the timeline can be found on [page 9](#):

**Year 1 | April 2019 to March 2020:** establishing the program experts and executing and managing the call for expression of interest (EOI) and proposal submission.

**Year 2 | April 2020 to March 2021:** awarding the research grants, contract establishment and fund transfer, project initiation, network building, and initial knowledge development and support through LabOne hub activities.

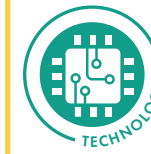
**Year 3 | April 2021 to March 2022:** network building, knowledge development and sharing, ongoing research project fieldwork, interviews for the GDS Program research and LabTwo hub activities.

**Year 4 | April 2022 to October 2022:** completion of research projects, submission of final research reports, dissemination of projects through the GDS website and GDS closing summative event.

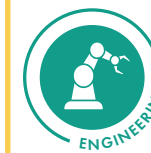
Scholars in humanities, social sciences and design are actively transforming the traditional science, technology, engineering & mathematics (STEM) fields into something with a more human-centred approach, taking STEM to STEAM by including the arts.



**Science** is a knowledge discipline that uses experiential observations as a method for evaluating the validity of the information. Different branches of science include chemistry, physics and biology.



**Technology** is a crosscutting area where development of tools through specific techniques, practices and processes occur. Technology may be applied to various sectors, including medicine, where biotechnology such as vaccines are used. Other examples include wind turbines in the renewable energy sector.



**Engineering** is a discipline focused on the design and construction of machines, buildings, and other structures, and can include, for example, bridges, tunnels, and vehicles.



The **Art** domain is concentrated on expressions of creativity found in human cultures and societies through skills and imagination in order to produce objects, environments, and experiences. Major constituents of the arts include visual arts, literature, and performing arts.



**Mathematics** is an area of study that uses deductive reasoning, abstraction, and logic in a quantifiable manner to understand the world. It can range from statistics to geometry.

Driven by local interests, the awarded projects go beyond the common focus of gender innovations in health & agriculture by supporting advances related to six sectors:



**Infrastructure** is the physical systems of a business, region, or nation. For instance, transportation systems, communication networks, sewage, water, and electric systems are all examples of infrastructure.



The **manufacturing** sector engages in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. It is most commonly applied to industrial design, in which raw materials are transformed into finished goods on a large scale. Examples of manufactured goods include aircraft parts, household appliances and handicrafts.



**Built environment & housing** encompasses places and spaces created or modified by people to serve their needs for accommodation, organization, and representation. It covers architecture, landscaping, housing, public space, and access to resources, such as proximity to grocery stores.



**Transport & mobility** deals with the movement of people and products locally and internationally. It links people to jobs, delivers products to consumers, and connects regions and communities to each other and to international markets. It serves and attracts domestic & international trade. Examples include railroads, shipping, & public transport.



**Accessibility** refers to the design of products, services, and/or environments so it is usable and accessible for people with disabilities and those who face, for example, financial or class barriers. Examples can include assistive technologies on websites, street design for wheelchair users and improving access to services that are usually unattainable in current systems.



The **renewable energy** sector is focused on deriving energy from natural processes that are replenished at a rate that is equal to, or faster than, the rate at which they are consumed. There are various forms of renewable energy, including wind energy, solar, and hydropower.

**HUB activities**

Based on the outcome of the Inception Workshop (see below), the importance of a flexible and adaptive structure was identified as a main approach towards exploring and achieving the three goals of the project (see above). In response to new constraints brought by the COVID-19 pandemic in the spring of 2020, the GDS program HUB became a platform for the exploration and advancement of Gendered Design knowledge and practice amongst research teams. The HUB included different kinds of activities, tools, and procedures throughout the lifespan of the GDS Program. Labs were presented as physical and virtual spaces to facilitate participatory practices by;

- **sharing** different expertise and contributing to the topic of Gendered Design;
- **networking**; and
- collective **knowledge building**.

**The research problem**

The GDS program aimed to promote the design and documentation of STEAM-based technological innovations to address challenges and biased perceptions predominantly faced by women in LMICs. By administering calls for case studies of experiences, narratives, and challenges for new designs, an interdisciplinary and cross-faculty group of experts based at Carleton University, collaborated with regional experts from Africa, Asia, and Latin America to contribute to a growing body of research dedicated to what we defined as ‘Gendered Design’. Primarily we aimed to extend the application, scope, and international reach of such research through working alongside and contributing to mutual capacity building and learning with innovators, researchers, and communities located in LMICs.

Gendered Design goes beyond simply addressing male-female labor gaps. The Gendered Design approach brings diverse and critical perspectives to the design process, which reshapes how we identify design challenges, the process to address them, the solutions to these challenges, as well as the reach of their benefits. Gendered Design as a growing field of knowledge seeks to:

- Identify and overcome gender bias from the knowledge base of a broad spectrum of fields that practice design processes.

- Identify, support, and promote socially and culturally aware approaches to design and development that can foster more equitable relationships, interactions, and dynamics.
- Ensure new products and processes are effective and inclusive, from their research phases to their initial applications, and onward.

Our program identified ‘research-through-design’ (RtD) as the research approach that supported the achievement of the above-listed aims. Through RtD, knowledge is built by integrating theoretical and practical exploration, academia, and real-world, researchers and users. Furthermore, it identifies participatory design as the specific way to practice RtD in this specific field of application. Participatory design allows one to bring into the design process different perspectives to address gender issues by including the affected stakeholders (often women) directly in the project and promoting interaction and exchange with the other stakeholders in the definition of a solution through a participatory process. This approach has been fostered when supporting the elected research projects so that design challenges are effectively addressed through a gendered lens.

While drawing on existing research on gendered innovation, this program aimed to broaden its scope by addressing the bias inherent to the design process, and by tackling issues that especially affect women in LMICs. Furthermore, at the encouragement of IDRC, the program went beyond their common focus on health and agriculture, by seeking responses for gendered innovations in the fields of STEM and STEAM-related to: transport/mobility, renewable energy, housing, manufacturing, and infrastructure, with the themes of accessibility and artificial intelligence cutting across these domains.

**Main outcomes**

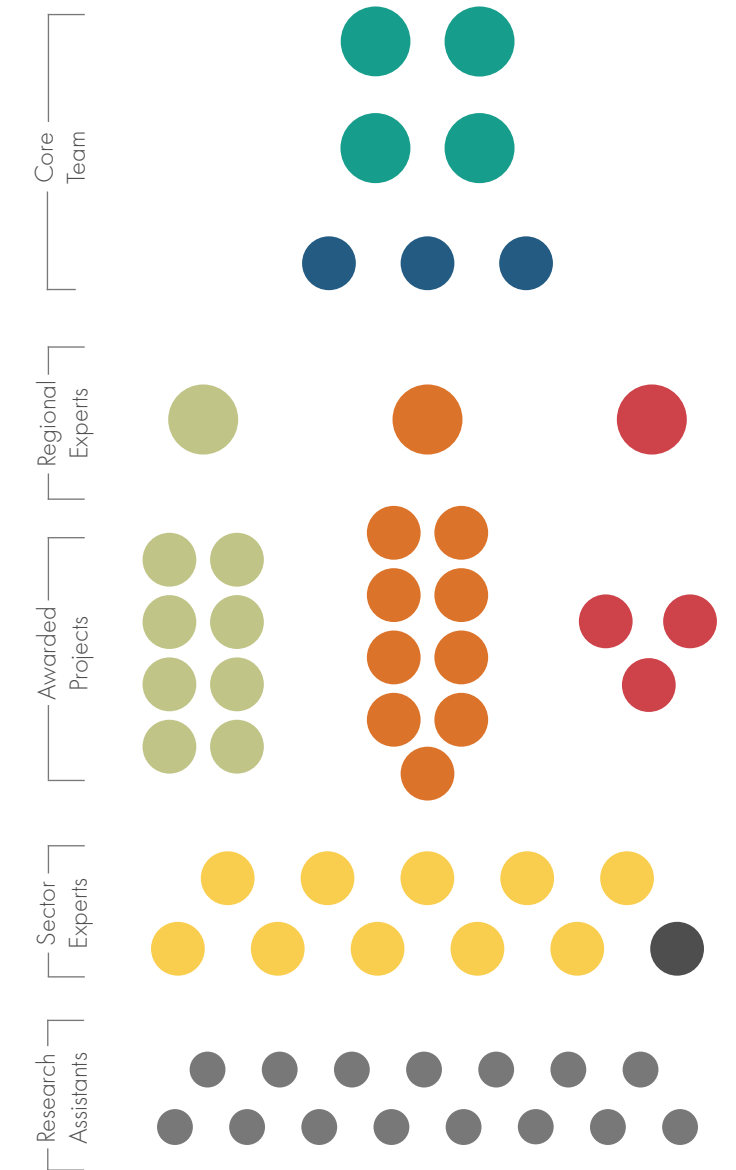
- Developed definitions of gendered design built upon local context and knowledge.
- Mobilized a strong collaboration between academics and communities in the Northern and Southern hemispheres.
- Supported and enhanced Southern and Indigenous academic voices, approaches, and cultures.
- Increased the visibility of local communities studied by these scholars.
- Promoted the dissemination of Southern research results.

- Created opportunities for researchers across the Carleton campus to work together with a common goal and do interdisciplinary work.
- Design Research Society paper acceptance and presentation.

The outcomes of the GDS Program are also seen through the individual achievements of each and every awarded research project team. Some of these outcomes and impacts have only just started to be visible, and over time the effects of the GDS Program will continue to grow and develop. Read more on our [GDS website](#).

**Structure of the GDS Program in numbers**

- 2** Principal Investigators from Carleton University
- 1** GDS Investigator from Carleton University.
- 1** GDS Program Coordinator from Carleton University
- 3** Research Assistant Coordinators (RACs)
- 3** Regional Experts for Africa, Asia and Latin America worked in close collaboration with the core team and the teams in their region.
- 20** Grant-awarded projects with scholars at institutions from LMICs.
- 10** Interdisciplinary experts and a gender expert based Carleton University
- 15** Research Assistants from Carleton University joined the Program at various points throughout the program.



## The timeline

**Inception workshop** - A two-day event was held at Carleton University to launch the Gendered Design in STEAM for LMICs program. The workshop refined the call for research projects, developed the protocol for case studies, and the dissemination process of the call. It highlighted the need for a flexible and culturally context-aware framework for the Program. Londa Schiebinger from Stanford University delivered a virtual keynote on their project dedicated to 'Gendered Innovations'.

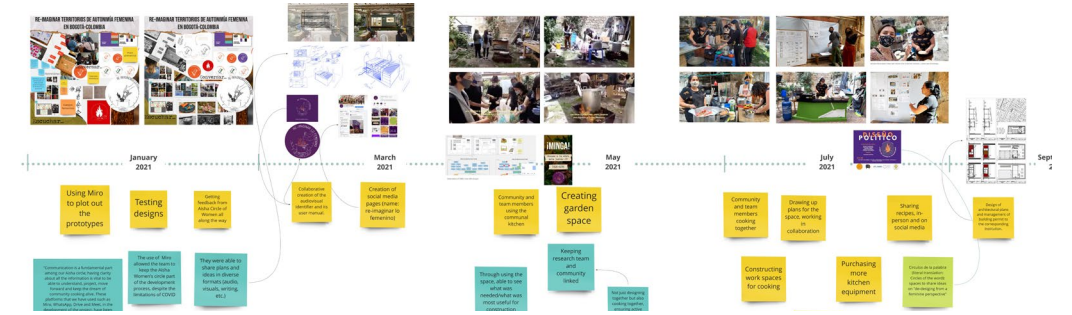
**LabOne | Sessions One to Four** - It helped put the foundations in place and provide tools and questions to stimulate discussions and reflections, during the workshops and beyond. Miro boards were used to support selecting and organizing core information, to promote reflections on the main issues and chosen methodologies, and to explore theoretical territory.

- Day 1 - lectures and conversations on crucial topics for Gendered Design (GD) research and practice.
- Day 2 - exploring together the characteristics of research and knowledge production on GD, and the relevance of situated knowledge and local perspective.
- Day 3 - discussing the methodological and research choices made, the design process envisioned and exploring together new possibilities.
- Day 4 - sharing reflections about the workshop activities and related achievements.



**LabTwo | Session Two - Prototyping** - The workshop evolved the notion of what prototypes are and how they can be used, and how prototypes of process and activity can be explained as an iterative activity of learning that also involves participants in some way. The workshop had two main activities:

- 1 - produce a summary on the projects' prototypes and consider questions for each identified, including the prototype description and how it will be implemented; is it physical or digital; what is the purpose and objectives of the prototype; what are the gendered considerations and how does the prototype address gender implications?
- 2 - create a timeline of all the prototyping activities.

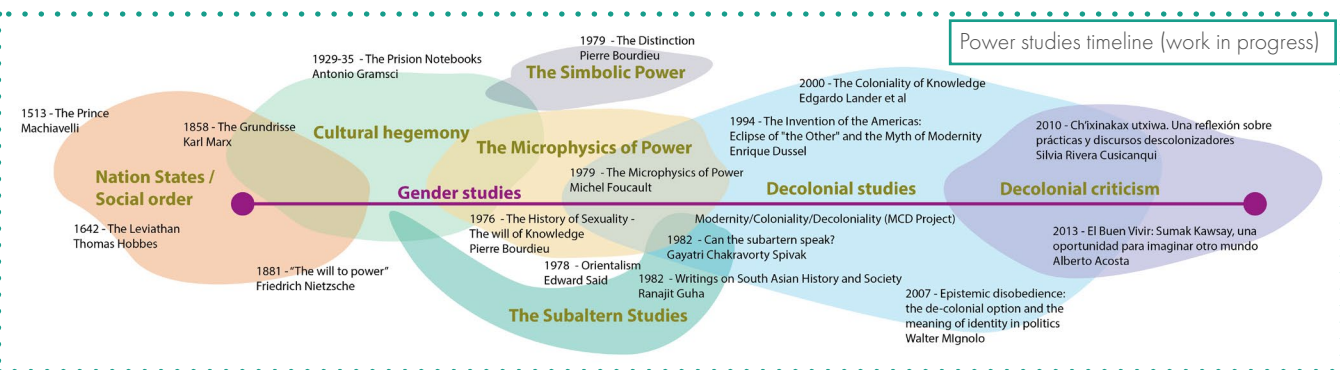


**LabTwo | Session One** - The session explored the interconnections between power, design, and gender, from post-modern and de-colonial perspectives. Drawing specifically from Michel Foucault's and Silvia Rivera Cusicanqui's work, four key concepts were identified to analyze and think about a design practice that embraces gender issues and opportunities; discursive formations and dispersions; conditioned participation; time control; and engagement in making. The first two concepts were the focus of the session.

Questions discussed included:

- What type of tool(s) did you choose? How did you choose them?
- Do they reveal a way of thinking and acting on gender issues? What are these?
- Who is allowed to participate?
- What role can someone play?
- What activities can be attributed to those who decide to join the process?

Foucault, Michel. (2002) *The Archaeology of Knowledge*. London & New York: Routledge.  
 Rivera Cusicanqui, Silvia. (2010) *Ch'ixinakax utxiwa: Una reflexión sobre practicas y discursos descolonizadores*. Buenos Aires: Tinta Limón.



## THE 20 GDS PROJECTS

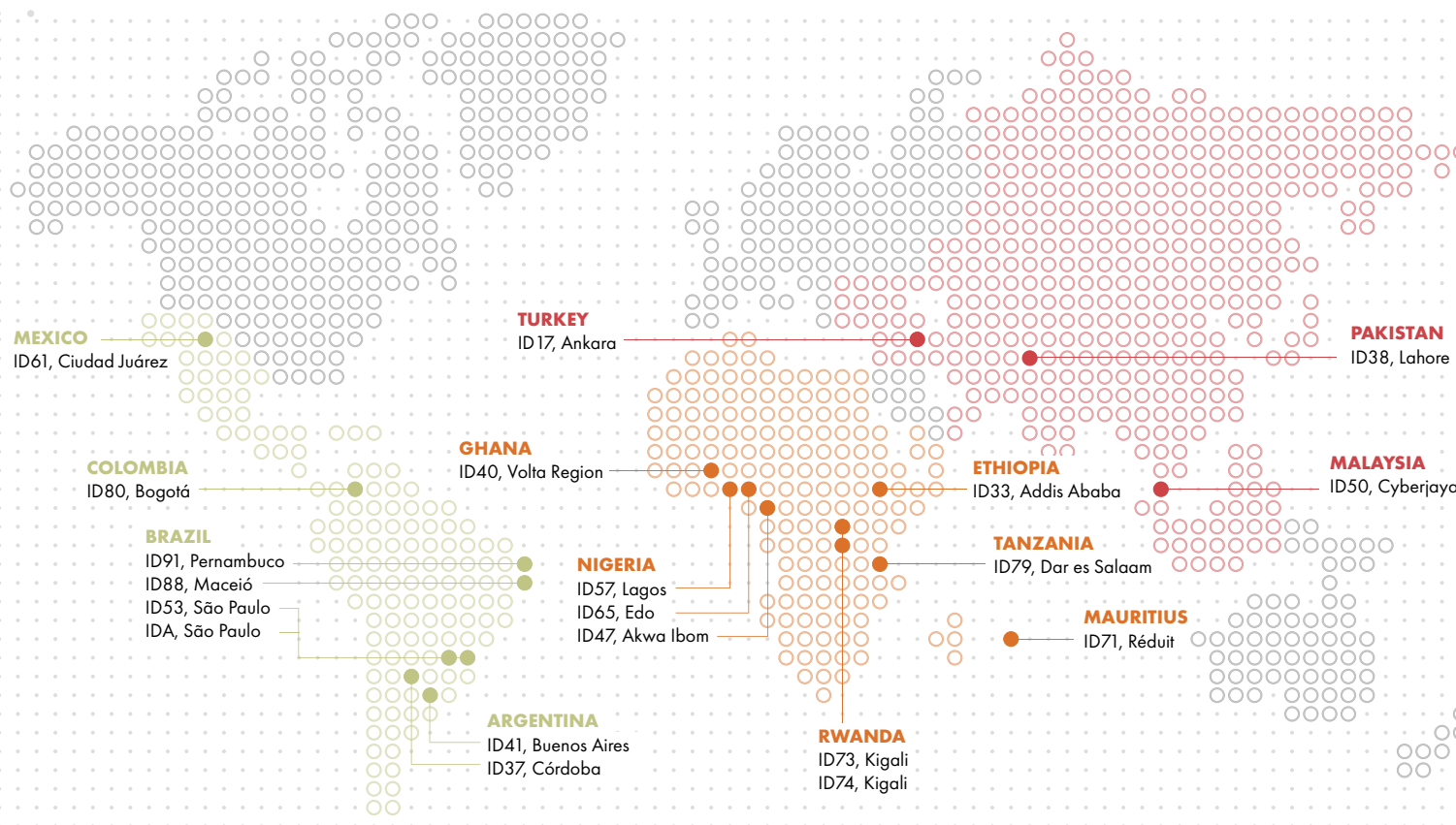
The 20 research teams who were awarded funding under the GDS Program came from Africa, Asia and Latin America, spanning 13 different countries. The teams worked in a variety of fields and they shared a common goal: to identify and overcome gender bias and tackle issues especially affecting women in Lower-and-Middle-Income countries (LMICs). The scholars leading the research projects were encouraged to use participatory design in their research to bring diverse and critical perspectives to address gender issues by including the affected population (often women) directly in their project, reshaping how design challenges and solutions are addressed.

You can read more about the individual research projects on our GDS website: <https://carleton.ca/gendesignsteam/>

The information presented here has been adapted from the project posters created by Research Assistants from Carleton University. Some team members shared feedback on their experiences that have been included here too. The posters are available on the GDS website and for the streams in Latin America were also translated into Spanish or Portuguese.

A series of short videos (primarily produced using information gathered during oral history interviews conducted by Dominique, Chiara and Ona with the project PI) about each project were also created and watched at the GDS closing event on Tuesday 4 October 2022. The event brought together the GDS network to celebrate their achievements. For the event, the projects were divided into five groups of converging interests and they are presented here in the same groupings.

You can watch all the videos here: <https://youtube.com/playlist?list=PLkavYUlgT2sMsLU2RKeRUHyWZCen1wbn5>






## Group 1

The projects in this group address topics such as; women's safety and well-being on public transport, mobile services for aging women, and services for women suffering workplace harassment. In all these cases, it is possible to see how starting from a specific and 'narrow' topic, the research process to address gender-related issues shed light on wider issues and on the tangible and intangible infrastructure that supports them. Furthermore, even if the approaches implemented by the teams are quite diverse, they are emblematic of the attempt and relevance to interact with the people affected by specific issues. This was a key element of their research process and challenges, as well as creativity, on how to do that on the researchers' side.



You can watch the project videos in this group on the GDS YouTube channel through this playlist: <https://youtu.be/6UOKB29fxLg>

- ID17




Improving the design of public transport based on women's experiences in Turkey




- ID74



Improving transportation systems for women in Rwanda



- ID38

Designing support services for women experiencing workplace harassment in Pakistan




- ID50

Designing mobile services for ageing women in Malaysia





**Team**

**Pinar Kaygan**  
Principal Investigator  
PhD in Sociology

**Asuman Özgür Keysan**  
Co - Principal Investigator  
PhD in Government and Public Policy

**Harun Kaygan**  
Researcher  
PhD in Architecture and Design

**Hilal Şahin**  
Junior Researcher  
Masters in Industrial Design

**Begüm Göktenav Güzel**  
Junior Researcher  
Masters in Telecommunication Engineering

**Institution**  
Middle East Technical University

*“So you define, and to a certain extent, strengthen the gender roles in society as a designer, via the products you develop.”*

— Pinar Kaygan

**ID17 Gendered Commutes in Ankara: Women’s Experiences, Strategies and Implications for the Design of Public Transit**



The aim of the project is to answer the question of how and to what extent the gender-related problems experienced by women in public transportation in Ankara can be tackled as a design problem. This research first interviewed women then the data collected was incorporated into design ideas by four professional industrial designers through a series of design intervention activities.

**Outcomes**

The interviews were thematically analyzed identifying:

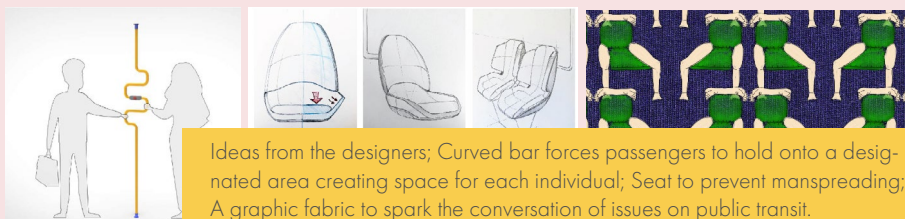
- Types of gendered problems (lack of personal space, physical contact, dangerous and fast driving, feeling unsafe etc.)
- Adopted strategies (sitting next to a woman, sitting in a high seat, looking out of the window, wearing headphones etc.)
- The relationship between these and the elements of the vehicle interiors (seats, windows, doors etc.).

Insights and opportunities for intervention

- Seat design and plans to shape personal space
- Seating plan, and optimization of visibility to allow for easy exits
- Bars and poles to mitigate ambiguity in touching
- The opportunity to use information and communication technologies in line with passengers’ own strategies.

Design

- These opportunities were then interpreted by four designers who each created 3 solution concepts. These ideas included bus plans to code personal space, apps to share location with user’s close circle, seats to prevent manspreading (act of a man sitting with legs spread far apart), bars and poles to create personal space, public transit riders license and many other ideas.

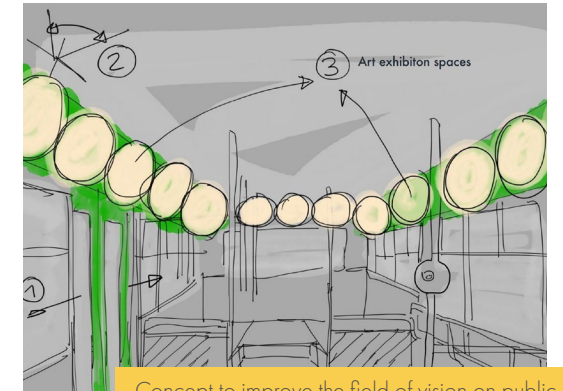


Ideas from the designers; Curved bar forces passengers to hold onto a designated area creating space for each individual; Seat to prevent manspreading; A graphic fabric to spark the conversation of issues on public transit.

**Methods**

The methodology of this research had 2 phases.

- In the first phase, 32 women were interviewed: 10 domestic workers travelling to work, 12 university students commuting between university campuses and the city center and 10 women who are 65 or older, who travel free on public transportation except during rush hours.
- The interviews were then analyzed. These interviews explored women’s interactions with the vehicles as passengers, with other passengers, and with drivers. Along with questions on their travel routines day to day and being a woman on public transport.
- In the second phase the analyzed data, was presented to subject experts as well as four designers who after a group discussion on if and how designers can tackle gendered problems. They were given 2 weeks to design solutions to the problems identified and keep a diary of the process.



Concept to improve the field of vision on public transport by including art exhibition space

**Lessons & Future Directions**

- If the team were to continue this research, they would like to expand it in two ways:
- To extend to other products: If they could look at other products also not addressing women or men, maybe they could find further insights about the gendering of products via design, and how design can contribute to gender problems.

- To extend to other contexts: In the project, they focused on a specific context, a specific country and a city. Future endeavours may look at different contexts to see how their findings comapre.



**Team**

**Didacienne Mukanyiligira**  
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PhD in Telecommunications Systems, Member of the Rwandan Association for Women in Science and Engineering (RAWISE)

**Marie Grace Umumararungu**  
Co- Principal Investigator  
Master of Engineering, Member of RAWISE

**Eva Liliane Ujeneza**  
Co-Principal Investigator  
Member of RAWISE

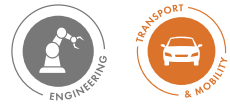
**Agnes Mbonyirivuze**  
Co-Principal Investigator  
Member of RAWISE

**Institution**  
University of Rwanda and Rwandan Association for Women in Science and Engineering (RAWISE)

**“...Gendered design. It’s research you do considering gender aspects to produce a product that is good for all genders, men, and women.”**

— Didacienne Mukanyiligira

**ID74 Improving transportation systems for women in Rwanda**



Since the early 1990s, gender mainstreaming has been developed as a tool to help in implementing new policies in different areas, however, this tool has not been properly utilized in the transport sector. This project focuses on including gender mainstreaming in the research of the transport system in Kigali City, Rwanda. The gendered public transport project shows that there are tenacious and clear gender differences in transport patterns amongst women, elderly people, and people with disabilities. This research project shows that transport policymakers and researchers must pay attention to gender issues in order to incorporate gendered designs that will impact and improve transport policy and transportation systems.

**Outcomes**

- Multiple versions of a questionnaire produced to address issues faced in the Rwandan transport policy regarding gender design. Multiple versions were produced due to the changing circumstances of Covid-19.
- Raised awareness among stakeholders and policymakers in the transport sector that address the needs of gender design for vulnerable populations such as pregnant women, elderly citizens, children, and people with disabilities.
- Training manual produced by the research team that guides the user on how to collect data ethically and successfully.
- Formed new partnerships with donors interested in improving transportation policies within their own cities and countries.
- The Rwandan Association for Women in Science and Engineering (RAWISE) advocates for, collaborates with and encourages younger generations of women to pursue a career in STEM. This project is an example of how women in STEM who are dedicated to changing policies can improve gendered designs that in turn positively impact social and economic structures.



Research team developing a training manual prior to collecting data in the field.



Enumerators at a bus stop in Kigali City, Rwanda, conducting interviews.

**Methods**

- Prior to starting the project, the team applied for ethical clearance, as well sent in an application for authorization to conduct data collection within Kigali City.
- Workshop amongst the researchers was held to create three questionnaires, one for policymakers and the others for public transport users in English and the local language, Kinyarwanda.
- The research team held a workshop to develop a training manual that indicates the important and ethical protocols for interviewing participants. Later, a workshop was held using the manual to properly train enumerators before going into the field to collect data.
- The first questionnaire was administered to policymakers to understand who, how and what policies are developed in terms of the transport systems. Data was collected through interview processes.
- Other questionnaires collected information from public transport users by focusing on social, economic, health and safety of the participants. The questionnaire gathered data from all genders with a focus on vulnerable populations such as women and pregnant women, children, elderly peoples and peoples with disabilities. The questionnaire was administered through interviews at the bus stations and on the buses, as well as through a QR code so that participants could answer the questions in their own time.
- Covid-19 was an obstacle during data collection due to reduced capacity on public transport, lockdowns and curfews. The team had to postpone data collection, but was able to add questions on how the pandemic has impacted public transport systems. The results were used to encourage more changes to transport policies.

**Lessons & Future Directions**

- The training manual for data collection was successfully developed and can be adopted by other researchers looking to improve transport policies in their own cities.
- A report is being produced based on the data collected that will display the results of the project so that policymakers can use this information to improve the designs of the public transport system in Kigali City.



Buses are the main source of public transportation in Kigali City, Rwanda. Other public transport systems include motorcycles and bicycles.



**Team**

**Maryam Mustafa**  
Principal Investigator  
PhD in Computer Science

**Hadia Majid**  
Co-principal Investigator  
PhD in Development  
Economics

**Institution**  
Lahore University of  
Managements Sciences

**ID38** Designing For Support Against  
Workplace Harassment For Low-Income  
Women in Pakistan



The project aims to understand the potential of technology to provide women in Pakistan equitable access to employment opportunities and safe spaces for their narratives of workplace violence and harassment. The research team conducted a qualitative study of female factory workers in regions of Lahore and Faisalabad districts to understand their experiences of harassment and marginalization. Design methods were used to explore ways in which to support addressing their negative experience of harassment and abuse while allowing them to navigate patriarchal barriers to work.

**“Technology has such great potential for connecting women, in context where their mobility in public spaces is very limited.”**

— Maryam Mustafa

**Outcomes**

- The project contributed in creating interdisciplinary opportunities by establishing a new research cluster named GenTech: The Gender and Technology Research Cluster at the Lahore University of Management Sciences (LUMS)
- This project has led to long-term collaborations with community organizations (Akhwat, HomeNet, and the Labour Education Foundation) and researchers across Pakistan and reduced the information asymmetry between researchers and NGOs in creating effective policy.
- A research paper has been accepted in various prestigious conferences, including the ICGSA gender conference in Africa.
- Findings from this project were also showcased and discussed in a journal article that has been

accepted by Gender and Development for this year’s November Issue on ‘Women, Work, and the Digital Economy.’

- Finally, insights from the project were discussed during a workshop arranged by the Principal Investigators with representatives from women’s and digital rights organizations.



Image taken during one of the interview session with participants

**Methods**

- To explore women factory workers’ experiences of harassment in their workplaces and on the commute to and from work, as well as their ideas surrounding digital technology use for addressing harassment, the team used qualitative data collection methods, i.e., semi-structured interviews and participatory design activities.
- The team conducted 69 interviews facilitated by the established not-for-profit community organizations (Akhwat, HomeNet, and the Labour Education Foundation) in Pakistan that work towards empowering low-income, working-class women using snowball sampling.
- The team conducted six participatory design workshops with a median of five women per workshop in five locations across the Lahore and Faisalabad districts using video, visual cues, and a card-based game.



Images of visual cues and game cards used in participatory design activities



**Lessons**

- The most significant learning has been in understanding co-design with low-literate women in patriarchal restrictive contexts. This includes understanding and testing different visual mediums, starting from a simple video and images to a more restrictive card game and finally a more open game with modifiable components.
- Another important lesson learned on the importance of creating safe spaces for interviews with female participants, especially when discussing sensitive topics like harassment, and curating safe physical and emotional spaces where women can unpack their experiences in a supportive way.



Image taken during team’s qualitative data gathering in one of their target communities



**Team**

**Ah Choo Koo**  
Principal Investigator  
Associate Professor, MMU

**Chui Yin Wong**  
Co-principal Investigator  
UX Architect, Intel Corporation

**Yvonne Lee**  
Project Member  
Lecturer, MMU

**Wan Teng Lai**  
Project Member  
Senior Lecturer, MMU

**Hazwan Mat Din**  
Project Member  
Research Officer, Universiti Putra

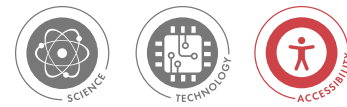
**Jia Yue TAN**  
Project Member  
Graduate Research Assistant,  
MMU

**Institution**  
Multimedia University (MMU),  
Malaysia

*“Everybody is moving or transforming into digitalisations. And it has become more of a challenge for the elderly. How can they access internet and the digital tools and all those things for them to get information?”*

— Chui Yin Wong

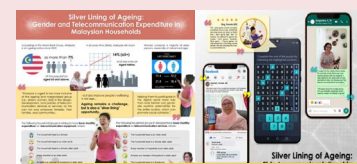
**ID50** Designing mobile services for ageing women in Malaysia



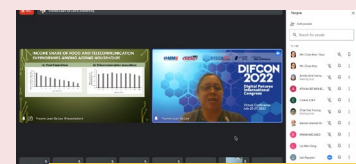
Malaysia reached its demographic trajectory to become an aging society in 2020, and the aged population remains low in adopting mobile technologies. To improve the participation of this user group and align them with technological development, this project aims to explore mobile usage behaviour, and expenditure on telecommunication among female elderly in Malaysia and propose a framework to better design mobile services for them. To achieve this objective, the research team conducted quantitative studies and a qualitative study involving female elderly participants to explore their use of mobile services through the lens of intersectionality.

**Findings and Outcomes**

- Through the intersectionality approach, the study identified how the mobile use preferences, behavioural patterns, and expenditure on telecommunication among female elderly in Malaysia.
- The quantitative studies of microdata revealed that the access to telecommunication services and equipment is generally lesser for older adults, especially for female older groups. Ability to access and affordability are the key factors for equal opportunity to access the Internet, mobile technology and services to these user groups.
- The qualitative studies explore the relationship of aging women with their use of smartphones and mobile services in their everyday lives, along with their learning ability and motivation to improve their digital literacy.
- The team submitted an infographic work to Multimedia University - Faculty of Creative Multimedia’s exhibition event series, “bisik” and “laung” (which means “whisper” and “shout”) in June 2022.
- The team authored and presented two papers at Digital Futures International Congress (DIFCON 2022) conference organized by Multimedia University (MMU), dated 25-27 July 2022. Phase 2 study was accepted in an indexed journal (International Journal of Technology, Scopus Q2).



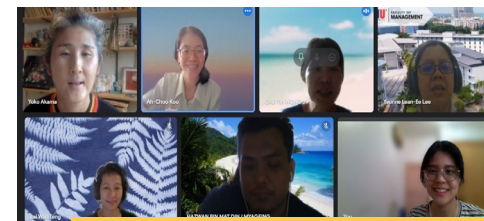
Submitted creative work for “bisik” / “whisper” exhibition event



One of the papers is being presented by Dr. Yvonne Lee

**Methods**

- Microdata acquired from the Department of Statistics Malaysia’s Household Income, Expenditure, and Basic Amenities Survey (HIES), which occurs once in five years, was used in Phase 1 as a Quantitative data study.
- Qualitative methodology was used in Phase 2. The team conducted nine case studies via Zoom video sessions to gather information from elderly women participants.



Meeting and discussion with regional expert, Dr. Yoko Akama from RMIT, Australia

**Feedback and reflections from ID50**

**Koo Ah Choo (PI)**

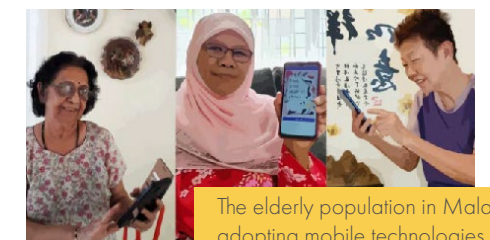
“GDS project has **opened a research path** for me on gendered design in the perspective of mobile services and applications, especially for elderly females. I have a strong interest in inclusive design, and the current GDS project has given me opportunities to research on gendered design for inclusivity, particularly in addressing to SDG 5 and 10 which are specific goals and meaningful, and less explored in this region. I have had the opportunity to lead a research team of this research area to work on these two SDG goals.”

A **fun and memorable experience** was a chance to get to know various research projects from many countries from Africa, Latin America and Asia. I got to know and learn about their gendered designed projects of different topics, in context with the different cultures and purposes. As for my project, one memorable experience was a participant of Malay culture, who shared an audio clip with us, of her karaoke singing class, that she sang a Chinese song. Smart phones have the audio recording feature that enable elderly females engaged in their leisure or talent activities. Multimedia feature and other features and facilities on smart phones and services had made many participants expressed that their smart phones are their intimate ‘friend’.

The **key learning** would be the points made by Associate

**Lessons & Future Directions**

- Achievements from this project include the collaborative effort working across different institutions and knowledge sharing with multidisciplinary experts such as gerontechnology, user experience, gender study, and creative multimedia that benefited this study and will benefit future endeavours.
- The project team was exposed to the intersectionality approach through this research project that broadened their perspectives.
- The research outcomes will be used to inform policy makers, technology innovators and designers for greater impact in regard to societal and gender development.



The elderly population in Malaysia is adopting mobile technologies

Professor Dr. Yoko Akama in her summary video, that gendered design researchers (in GDS Programme) have collectively worked together for solving gender inequality issue. Gender issues has been rooted through historical, complex and socio-cultural constructions. The research programme has strategically and systematically involved **transdisciplinary** research teams; this shows the great promise of the GDS programme and all of the research works conducted. Methodologically, that most projects have opted qualitative research that have the elements of openness, trust, safety and courage during the conducts of the studies, and to allow the researchers establish dialogues on the complicated issues. The above two key points are so important that has influenced my view on gendered research and design works, and has set as guidance to my research works and directions.

Gendered design for mobile application and service design have much potential, especially for supporting female elderly’s needs. The research on technology use in industrial 4.0 era and the design ideas are much needed for **improving the life-supported services for elderly** in the aging nations, especially the vulnerable ones, who needed social care, self-improvement, health and well-being. This is an area that I have much anticipation to work on in the near future.”

**Chui Yin Wong (Co-PI)**

" *The experience* | Collaboration effort among national research team with international research team support from Prof Yoko and also Carleton University. A good research advice from Prof Yoko on using intersectionality approach changed the research approach for our second phase of research.

*Fun & unexpected* | Collaborative working on Miro board set-up by Carleton university that enabled all the research team to come together at the beginning of the research.

*Future goals* | To bring the awareness and integration of Gendered Design on any product design and digital solutions. "

**Terra Tan Jia Yue (Graduate Research Assistant)**

" The fun and challenging experience here is that I was able to design and submit 2 creative infographic works for our project, titled 'Gender and telecommunication expenditure in Malaysian households' and 'female elderly's relationships with their smartphones' to the **'bisik' (which means 'whisper' and 'shout') exhibition event** organised by our institution, Multimedia University. It was a challenging process to complete the artworks in such a short period of time (around 4 days) before their due date, and with my limited experience in creating research-type of artworks.

Another exciting fact that occurred a week before the GDS

Program Closing event, where on the 26th of September 2022, our team had organised an **online research sharing webinar**, titled 'Canada IDRC and Carleton University funded: Designing Mobile Services for Ageing Women in Malaysia,' in collaboration with Universiti Putra Malaysia (UPM), Universiti Sains Malaysia (USM) and Intel Corporation. I had the opportunity to assist the PI in organising and executing the event. There are various stakeholders attended our webinar and provided valuable insights for our project. The link to access the newsflash: <https://www.mmu.edu.my/2022/09/gaining-in-depth-insights-into-seniors-telecommunication-and-mobile-phone-usage/>

This research project serves as a starting point that incorporated gender analysis, age, female and societal perspectives in technological and service design studies in Malaysia. Therefore, the future goals plan to investigate the older-aged group elderly (70-80 years old) in Malaysia, living in different geographic areas (to study the diverse mobile culture), lower-income groups of, their experiences and behavioural patterns in mobile phone usage, incorporating gender and intergeneration perspectives. of, their experiences and behavioural patterns in mobile phone usage, incorporating gender and intergeneration perspectives. "

**Group 2**


In the following group of projects, we have two that look at the gendered perspectives of the built environment for educational and public institutions in Rwanda and Argentina, respectively. You will see how inclusive needs of women in these environments spanning two different continents are uncovered through ethnographic data collection. Through surveys and data collection, we are learning more about important issues such as perceptions and understandings of gendered washroom requirements and lactation rooms and how researchers in both countries can impact public policy and architectural planning through the GDS program.

The other two projects relate to fish drying in Nigeria; an occupation mostly held by rural women in that country. Women have been consulted in the field and their input can be seen to really influence understanding what the human centred issues are prior to the engineering and scientific phases of work. For example, both fish drying projects reinforce the local women's opinions and knowledge of the

fish drying process and how the quality of the taste of the fish cannot be a secondary issue. On that basis the researchers are using their scientific and engineering approaches together with these insights to prioritize outcomes important to the local communities. Note how important the prototyping process was in engaging with the communities through the ability to create new types of renewable energy briquets and new cleaner burning fish drying ovens. Place particular attention to how some of the prototypes are built not as final fish dryers, but as testing prototypes to allow the fish merchant to use them to make sure that the final product is acceptable in terms of the factors important to them, such as renewable energy sources, less smoky production and a product that tastes as good as the original products produced. This shows how important it is to get buy in from the local stakeholders and how prototyping can help in that situation.

- ID73

Improving the design process for housing and public spaces based on women's experiences in Rwanda





- ID41

Re/designing the University of Buenos Aires campus to be gender inclusive in Argentina






- ID47

Improving the design of upland fish drying technology for female fish vendors in Nigeria




- ID57

Developing an alternative energy-sourced fish dryer to improve processing for small-scale female processors in Nigeria






You can watch the project videos in this group on the GDS YouTube channel through this playlist:  
<https://youtu.be/oUr2eqHaESI>



**Team**

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**Roselyne Ishimwe**

Principal Investigator  
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**Marie Antoinette Uwajambo**

Masters in Civil Engineering

**Delphine Mukaneza**

Masters in GIS

**Colette Abimana**

PhD in Energy and Materials

**Institution**

Rwandan Association for Women in Science and Engineering (RAWISE) and University of Rwanda (UR)

**ID73** Improving the gendered design in housing and public spaces based on women’s experiences in Rwanda



This project explored gendered design in housing and Public spaces in Rwanda to identify gendered issues and suggest guidelines to make spaces more accessible for all genders. Data was collected through visits to different universities, institutions and public spaces and surveys given to policymakers and beneficiaries. A gender analysis tool helped to identify how gender can be implemented in the design of spaces and a report with guidelines was written.

*“There is a gender disparity in the field of constructions, architecture and also in the decision making position to influence the policy makers to make sure that there is an inclusiveness of gender design.”*

— Marie Chantal Cyulinyana

**Findings**

The following statistical findings are representative of the data collected from the participating institutions:

- Over 55% of the houses are not accessible to disabled and vulnerable people.
- 96% of houses had toilets, however, only 0.4% had toilets dedicated to disabled people, in addition, institutions had only 41% of toilets designed for women. In the remaining men and women shared toilets. This can make women and disabled people uncomfortable and not meet their specific needs.
- 52% of institutions had kitchens however 75% of those kitchens did not have any amenities available (sit, spoons, kettle, microwave, fridge, etc..) this makes them less functional. This can be challenging for vulnerable people (pregnant

women and disabled people) since they may have limited ability to access a restaurant or have specific dietary needs.

- 72% of institutions have an infirmary on the premises or nearby. 89% of the houses that had an infirmary nearby were multistorey buildings. This shows the effects of government policies implemented since many multistorey buildings are new in Rwanda.



Image of Hostel at UR Campus Huye, some improvement still needed

**Methods**

- This study employed qualitative and quantitative methodological approaches. The combination of those two methods led to a broader understanding of targeted buildings and people’s needs.
- A questionnaire was used to collect information and evaluate beneficiaries’ as well as policymakers’ and implementers’ views on gender inclusivity in housing.
- The questionnaire was sent to twenty-two different institutions with fifty beneficiaries responding to the questionnaire and 40 policymakers and implementers.
- The quantitative data was analyzed using Excel and GIS for geographical data presentation. Data obtained from close-ended questionnaires were analyzed using google forms and SPSS software.



I&M bank breastfeeding room one place looked at in field work; INES Ruhengeri and university of Rwanda UR CST during the field visit.

**Lessons & Future Directions**

- The research team learnt a lot about data analysis tools, writing skills and computer literacy and developed their negotiation skills as they had to adapt methods, timetables and approaches with stakeholders.
- They found that advocacy is a key action to raise awareness of the importance of gender consideration towards sustainable development.



Picture on the field at INES Ruhengeri during the field visit



**Team**

**Carolina Spataro**

Principal Investigator  
Gender, sexuality, feminism

**Griselda Flesler**

Co-Principal Investigator  
Gender, graphic design

**Rafael Blanco**

Social Sciences

**Paloma Carignani**

Architecture

**Valeria Durán**

Sociology

**Florencia Scalice**

Industrial design

**Ana Quaglino**

Biology

**Institution**

University of Buenos Aires

*“When you analyze spaces, you cannot analyze the material architectural space alone, but rather must analyze what happens with the uses of that space.”*

— Griselda Flesler

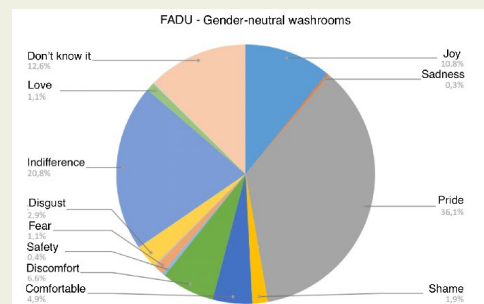
**ID41** Re/designing the University of Buenos Aires campus to be gender inclusive in Argentina



This research aimed to identify the impact of the gender policies implemented by the University of Buenos Aires, specifically on the spaces and everyday uses of its campus spaces. In order to understand how students, faculty, and staff perceive and appropriate campus space, the team carried out a massive online survey as well as an ethnographic study of social media accounts discussing campus spaces. Based on their findings, they have developed recommendations for institutions for the strategizing and application of gender policies in campus design.

**Outcomes**

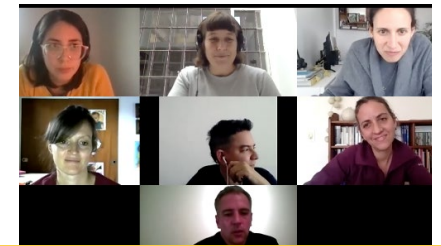
- From this research they have been able to identify a lack of knowledge about services available, the failure of some university space to meet certain needs, and some resistance to gender policies in the university community, as well as which spaces have had positive impacts.
- They developed recommendations based on their findings for designing educational spaces with a gender perspective. Recommendations included carrying out communication campaigns regularly to inform everyone on campus where spaces like kindergartens, gender-neutral restrooms or breastfeeding centers were, as well as how these spaces have a positive impact on the entire community and not just those specific individuals using them.
- The team has disseminated their findings and recommendations through presentations at universities in Argentina and around the world, and published articles and chapters on their conclusions. Their work has received very positive responses, because the issue of spatiality is not generally taken as a priority in institutional gender programs and policies.



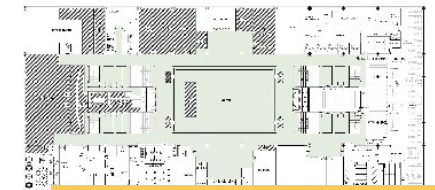
Graph of results from survey regarding perceptions of the gender-neutral washroom in the Faculty of Design and Urbanism.

**Methods**

- The team conducted a large survey with SurveyMonkey, to find out the perceptions of university spaces from students, professors and staff in the Faculty of Exact and Natural Sciences (FCEyN) and the Faculty of Design and Urbanism (FADU), with a total of 2064 responses. The team designed a list of sensations for the survey in order to understand the emotional associations of users with different spaces on campus.
- The limitations posed by the COVID-19 pandemic in conducting in-person ethnographic research made them turn to a digital ethnography methodology, developing what they call “netnography”. Through this research they have made important findings about the perception of campus spaces, including the development of a strong resistance to spaces that are the result of the university’s gender policies (such as gender-neutral restrooms).



Team meeting. Top, left to right: Florencia Scalice, Griselda Flesler, Paloma Carignani. Middle, left to right: Carolina Spataro, Ana Quaglino, Valeria Durán. Bottom: Rafael Blanco.



Plan of the Faculty of Design and Urbanism (FADU) used by the team.

**Lessons & Future Directions**

- It became clear from their research that resistance to gender policies needs to be taken into account in strategizing institutional gender policies.
- The development of this resistance is part of a broader phenomenon, and demonstrates that advances in the feminist agenda are not linear. The team plans to deepen this aspect of their analysis in further publications, and it will be the starting point for future research.



Sign for the gender neutral washroom on the University of Buenos Aires campus.



**Team**

**Uduakobng Aniebiat Okon**  
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Associate professor, agricultural sciences and technologies, gender and development

**Otu Bassey Ebeten**  
Co-Principal Investigator  
Construction technology and development

**Sito-Abasi Okon Mbuk**  
Research Assistant, MSc student

**Edikan Iboro Etuk**  
Research Assistant, Historian

**Ekikereobong Udofia Offiong**  
Research Assistant, MSc student

**Ephriam Edem**  
De- PENTACONS and Associates- Architects and Planning Consultants

**Hossana Gregory Ben**  
Research Assistant, MSc student

**Ediomobong Okon**  
De- PENTACONS and Associates- Architects and Planning Consultants

**Institution**  
University of Uyo

*“Mostly women will use the facility, the innovation that we are bringing, so they had to be considered.”*

— Uduakobng Aniebiat Okon

# ID47 Improving traditional fish drying technology design for women fish vendors in Nigeria



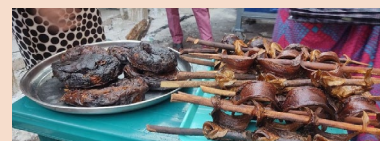
Fishing is the main occupation of the people of Akwa Ibom state of Nigeria. Women constitute more than 90% of the personnel involved in traditional fish preservation, handling, and marketing. The study was concerned with improved and gendered design of traditional fish Drying Technology, to address some lagging challenges in operations in the traditional fish drying cottage industry. Traditional fish drying methods are inadequate, inconveniencing, and dangerous to health. The team used questionnaires, interviews, and focus group discussions to identify the main hazards and challenges experienced by women fish processors and vendors. With this data, they designed improved fish drying technology prototypes in hopes of changing the industry to improve conditions for women.



Dr. Okon and Miss Edikan interviewing fish vendors in Udu Akpan Andem, Uyo.

## Outcomes

- Their findings present a case for the provision of improved fish drying technology in Akwa Ibom State and Nigeria at large.
- A fully functional fish dryer prototype was designed and produced, which took into consideration many of the suggested improvements discussed during the interviews and focus groups. The prototype eliminated many of the hazards from traditional fish drying methods, such as heat and smoke protection, improved sanitary conditions, etc.
- The team also designed a tabletop industrial model of an ideal fish drying facility, which includes many components to meet women fish vendor needs, including a major fish drying building, an on-site fish market, a playground for children, etc.
- The research users appreciated the gendered physical characteristic features built into the facility to improve traditional fish drying technology, and recommended this technology be adopted by the larger community.



Top to bottom: Tabletop prototype model of the modernized fish dryer; life-sized and fully functional fish dryer prototype, only one quarter of the intended modern fish dryer design; fish dried using the life-sized fish dryer prototype.

## Methods

- The team designed a questionnaire for women fish vendors in each senatorial district of the Akwa Ibom State. The questionnaire assessed the historical antecedent of gender involvement in traditional fish processing, current trends and gaps in traditional fish drying technology design, and the gendered characteristic features that are needed to improve fish drying technology.
- They conducted interviews with women fish processors and vendors in all the senatorial district of the Akwa Ibom State to assess the same concepts as the questionnaire.
- They also organized focused group discussions with women leaders of the Vendors Association in the state. These discussions assessed the technology gaps and needed gendered innovations to improve upland fish drying technology for women fish vendors in Akwa Ibom State.
- The team then designed and developed a modern fish dryer prototype, along with a table top industrial model of a fish drying facility based on the gendered needs identified from the questionnaire, interviews, and focused group discussions.
- Lastly, the team was able to demonstrate the functional life-size prototype to the Akwa Ibom State Ministry of Agriculture, the Department of Fisheries, faculty members from the University of Uyo, women fish vendors, and community leaders.



Focus group discussion in Eket senatorial district

## Lessons & Future Directions

- Their findings, when fully implemented, will provide economic and health solutions for women in the Akwa Ibom State and Nigeria as a whole, as expressed by the research users.
- Should the prototype designs be fully implemented at the local level of the senatorial districts in the state, public discourse would be enriched to help improve public policies on fish processing.
- The team hopes their research will positively influence policy practice on fish processing and the prototype be adopted in among women fish processors and vendors. Government representatives and policy makers that attended the prototype demonstration recommended the innovation be replicated when funds are available and adopted in the State.





**Team**

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**Institution**

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**ID57** Developing a hybrid fish dryer to improve processing for small-scale female processors in Lagos, Nigeria



In Lagos State, Nigeria, fish processing is a female-centric occupation dominated by traditional smoke-drying technologies that exhibit occupational hazards and fuel inefficiencies. Among fish processors in the small-scale fisheries sector, there has been limited success to introduce home grown technologies for adoption. Campaigns against the use of firewood and switching to charcoal have not been successful. Barriers to the adoption of improved fish smoking practices and sustainable energy use are influenced by cultural biases, socio-economic and psychological factors. Additionally, the energy crisis has added another barrier to the adoption of charcoal due to increasing costs. Based on the identified challenges, this project adopted a transdisciplinary approach conducting surveys and training workshops with fish processors, fishermen and other stakeholders to design a modernized fish dryer prototype and to evaluate the adoption of alternative biomass sources for fuel.



Dr. Abiodun-Solanke explaining the work of an integrated solar-biomass drying during the 2-day training workshop.

**Outcomes**

- Designed a functional modernized hybrid solar-biomass fish drying prototype. The prototype is made of two separate components; 1) a modern smoking kiln with a chimney and a charcoal pot in the smoking chamber (source of fuel: biomass), and 2) a parabolic dish solar collector with a fish drying chamber (source of fuel: solar energy).
- The modern kiln component is designed to use charcoal, gas and briquettes.
- Production of briquettes with charcoal fines, sawdust, and water-hyacinth obtained locally. They produced both carbonized and non-carbonized briquettes.

Based on sensory evaluation, fish processors exhibited willingness to try briquettes as alternative biomass source to firewood. The briquette-smoked fish was indistinguishable from charcoal and firewood, which was a major factor in breaking the cultural barrier to using alternative biomass sources.



Top to bottom: Modern smoking kiln with charcoal pot in smoking chamber and chimney at the top; Parabolic Dish Solar Collector with Fish Drying Chamber open to show Copper Plate at the base.

**Methods**

- The team conducted a survey to assess the perceptions of small-scale fish processors to the adoption of fish drying technology in Lagos State. They surveyed 22 communities across 4 of the 5 divisions in Lagos State (Badagry, Epe, Ikorodu, Lagos) known for high level of artisanal or small-scale fishing activities. They surveyed 412 women fish processors.
- They then designed a hybrid fish dryer prototype which would combine both solar energy and biomass fuel to dry and smoke fish.
- Next, the team produced briquettes with charcoal fines, sawdust, and water-hyacinth obtained locally. They also analyzed the physical, chemical, microbiological, sensory parameters, and economical feasibility of briquettes.
- Lastly, the team ran a 2-day training workshop with 12 fish processors and 2 fishermen that focused on training and raising awareness on alternative energy sources. The first day involved smoking fish with the hybrid fish dryer prototype and briquettes, the second day involved a sensory test to evaluate the developed fish drying technologies.



Left to right: Water-hyacinth (*Eicchornea crassipes*) at the jetty on Ojo Creek, used for the production of briquettes; Picture of one of the first hybrid fish dryer prototypes combining both solar and biomass fuel in one component; Mixing of biofuel materials with cassava starch for briquette production.

*“Fish processing in Nigeria is largely female-centric in the sense that women are the largest player in this value chain.”*

— Ayojesutomi Abiodun-Solanke

**Lessons & Future Directions**

- Peer-peer learning and ‘influencers’ among the fish processors played important roles in the social process of adopting briquettes.
- Adopting briquettes and smoking technology built on local skills will enhance well-being and contribute to sustainable incomes of small-scale fish processors.
- The team has planned a dissemination workshop to communicate findings to policymakers and the public in September 2022.
- The team is in the process of developing a low-cost modernized drum kiln designed the suit the circumstances and financial capacity of small-scale fish processors.

**Feedback and reflections from ID57**

**Kafayat Adetoun Fakoya (PI)**

" As the PI, I never envisaged the milestones we achieved under rapidly changing situations we found ourselves. We started the project with a hybrid solar-biomass dryer but ended up with a prototype drum oven built on local technology and successfully introduced carbonized biomass briquettes as substitutes for charcoal and fuel woods. These products have opened opportunities for developing value chains of carbonized biomass briquettes and also the production of the modernized drum. The importance and utilization of both products extend beyond the fisheries' value chains to the food and agriculture sectors.

The sheer impacts of these two products would unleash massive employment, wealth, and asset accumulation, lifting so many out of poverty and contributing to improved livelihoods, well-being, and food security.

The women fish smokers who worked with us showed so much enthusiasm and have undertaken the outreach on the oven and biomass briquettes to their peers within their communities and neighbouring communities.

One important learning was the engagement of the end-users in the construction of the prototype drum oven and in the smoking of fish with biomass briquettes compared to charcoal and fuel wood in which they were involved. These

were the game changers and helped concretize the results and outcomes.

I wish to take it to higher levels. My next step would be to apply for another round of funds for implement capacity building in production of biomass briquettes and fabrication of low-cost, improved drum oven. Also, I wish to leverage on the networks formed to utilize water-hyacinth, an environmental menace in fishing communities in briquettes production and other for other beneficial uses."

**Abiodun-Solanke Ayojesutomi (Co-PI)**

"It was and still an amazing experience working on this project. It is my first experience on a main gendered project, my confidence in introducing gender into subsequent approach of design has improved tremendously; I am more gender responsive in my research and other ventures such as outreaches, teachings among others. It was a good time with women from different walk of life and areas showing the same resilience through similar challenges. It was intriguing seeing them embrace the initiative and contributing to the success of the project. We gained different and balanced perspectives while working on the project than we set out with.

My compassion towards the needs of the disenfranchised gender has improved tremendously. I can see the importance of stakeholder engagement, mobilization, involvement and participation all through the project phase now. I also realised everyone is important especially in the adoption of improved concepts and initiatives. My team work ability too has improved tremendously, I view issues more objectively now. It was also amazing discovering some indigenous methods and practices that are sustainable with little improvements. We were exposed to more environmentally-friendly, sustainable, affordable, clean, under-utilised and available options. I also got exposed to updated tools in qualitative research and how best to maximise these for better outcomes.

One un-usual fact was the overwhelming enthusiasm and support from the rural women processors. The stereotypes all along before this project has been that women don't support women. This made us persevere and seek alternatives till we got solutions that are win win to all parties. We made contacts that will last for a lifetime in those women.

I read some FAO adaptable and adopted materials wherein interventions similar to what Ghanaians rural processors are used to conventionally worked best. This helped us in the discovering of local alternatives such as briquette. We researched more on various waste materials that can be used in the production of sustainable fuels. We found out people doing this on commercial basis and we collaborated with them on the production. The processors were also linked with the briquette fuel producers. Also, many youths in the communities have been introduced into the energy source value chains with many already going into this chain. Also, the drum kiln they use in the communities was improved in the area of energy conservation, aesthetics, affordability among others. They were open to adopt this just as what discovered in Ghana.

I intend to be more gender responsive and inclusive in subsequent research. I intend to continue in more improved research along the briquette and improved drum innovations. I will continue to work more with all the contacts discovered during this project. I have introduced all the new value chains discovered to other youths I train in another program so the logistics can be looked into for seamless and better outcomes."

**Group 3**

In this group, we have four projects, three from Brazil, from the Latin America Region, and one from Mauritius, from Africa. The projects are related to the axes of accessibility, manufacturing, and renewable energy. All of them are concerned with attentive listening to women. In all of them, we find the issue of female bodies - how do they emerge as the locus of the project? In their outcomes, there are many reflections on them. Bodies mutilated by breast cancer, violence, or accidents; changes in bodies during climacteric [menopause]; the potency and strength of female bodies to perform tasks that are traditionally performed by men... these were topics discussed by the projects in this group.





Another important feature was the idea of prototyping. This important topic to the design field was discussed in many ways: in a participatory approach, with the creative process

being carried out with women involved in the research, or by the researchers themselves, from the attentive listening of women affected by many kinds of biases, hostile environments, violence, and diseases.


It is important to mention that this program in general, and the four projects presented here, specifically, seek, in an exploratory way and through design, to reflect on epistemological approaches to what is called 'gendered design'. There is still a lot to be done in the systematization of theory and methodologies that build more representative worlds for women.

- ID91

Studying the use of artifacts to rebuild self-image and identity among female breast cancer survivors in Brazil






- IDA

3D-printed prostheses to support low-income female survivors of domestic violence, accidents or cancer treatment in Brazil




- ID71


Developing small wind turbines with local women for domestic use in Mauritius




- ID53

A case study of clothing design considerations of low-income, menopausal women in Brazil



You can watch the project videos in this group on the GDS YouTube channel through this playlist:  
<https://youtu.be/971IIDFLP6k>



Pernambuco,  
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### Team

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### Institution

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*“We... focus on gender when we value women’s personal experiences, when we offer them space for listening and a place to speak, or when we allow them to use their reports, images, and bodies to break the silence.”*

— Débora Ferro

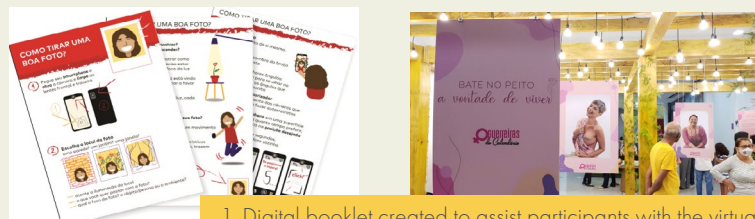
## ID91 Studying the use of artifacts to rebuild self-image and identity among female breast cancer survivors in Brazil



This study qualitatively analyzes the individual and social well-being of female breast cancer survivors who underwent mastectomies in Pernambuco, Brazil. This study focuses on the potential of design as a vehicle for the resignification of self-image by women who have undergone mastectomies due to breast cancer, and to aid in reducing negative perceptions about their bodies. Through interviews, workshops, and exhibitions in collaboration with The Support and Self-Awareness Group for People with Cancer, this study has collected diverse personal experiences from survivors of breast cancer and of those receiving treatments, has highlighted the demands during the different stages of cancer treatment, has provided insight on the relationship these women establish with their own bodies and with artifacts they use, and has allowed women to explore strategies to rebuild their self-image and break taboos related to breasts and breast cancer.

### Outcomes

- Due to the Covid 19 pandemic, virtual methods were adopted to carry out research. A booklet and video was produced to instruct women participants on how to use the google meet software in order to join in on the interviews and workshops virtually.
- Digital booklet created addressing photography tips for women to participate in photography workshop. Women participating in this workshop took pictures of themselves at different stages throughout the research. This research was used to evaluate the different relationships women had with their bodies during and after cancer treatment, as well before and after having a prosthesis.
- An exhibition was developed based on the research and the materials produced by the female participants, first as a virtual exhibition which was then translated into a physical exhibition called “Guerreiras do Calendario” (Calendar Warriors).

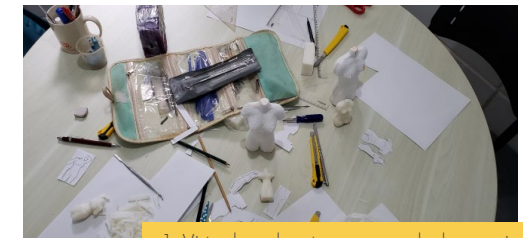
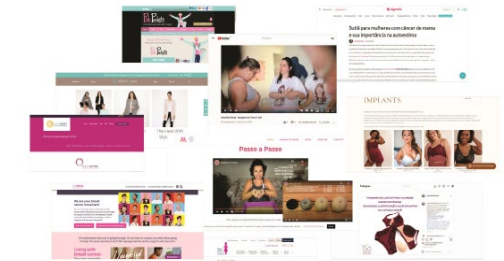


1. Digital booklet created to assist participants with the virtual meeting platforms so that they can participate in the meetings and workshops.
2. “Guerreiras do Calendario” (Calendar Warriors) exhibition.

### Methods

- Prior to conducting research, it was essential to be in contact with public hospitals, plastic surgeons, and mastologists to understand the public health point of view. Also partnered with the Support and Self-Awareness Group for People with Cancer in order to conduct interviews and create workshops. 30 women over the age of 18 with personal experiences with breast cancer and treatments participated in the interviews and workshops.
- Conducted a virtual search on blogs, forums, social networks and commercial websites that included strategies, artifacts and debates that were promoted by women’s organizations regarding the fight against breast cancer. The data collected from this search was used to guide the project further with the development of specific workshops such as clay modelling and photography.
- Due to Covid-19, experiment was reformulated and redesigned for a remote format keeping in mind the different ethical concerns that could arise through a virtual setting versus a physical setting. Workshops were thus conducted virtually and were centered around understanding the different experiences women have

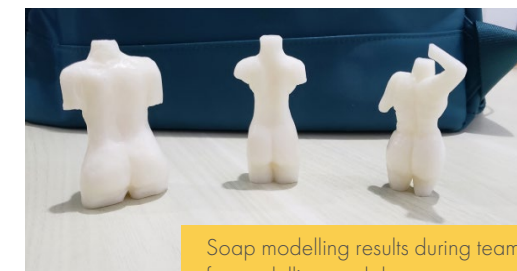
with breast cancer and treatments, how they perceive their bodies, and provided a safe space for women to share their stories and work towards rebuilding a positive image of their own bodies.



1. Virtual exploratory research done prior to conducting the workshops.
2. Modelling training workshop for the team using soap to create models.

### Lessons & Future Directions

- Expand the scope of the project beyond women with breast cancer to involve other people who have experiences with in different areas.
- This project was conducted in conjunction with the principle investigators thesis, in which a dissertation is being produced that will involve the research objectives, methods and outcomes of the project.



Soap modelling results during team training for modelling workshop.



**Team**

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**Institution**

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*“We started looking for more things about design, about Gender Design, involving more people, and asking ourselves what it was... our priority has been girls and women, because one of the goals is to increase the number of cases of assistance given to girls and women.”*

— Maria Elizete Kunkel

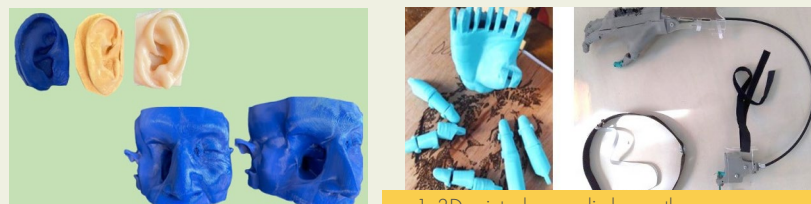
**IDA 3D-printed prosthesis to support female survivors of domestic violence, accidents or cancer treatment in Brazil**



During development before birth and throughout life, the human body can be mutilated or amputated due to a variety of causes. This study investigates how 3D printing as an innovative technology can be utilized for prostheses production for women with visible disabilities caused by domestic violence, accidents, medical conditions, or cancer treatment. 3D printing offers a more sustainable alternative when compared to traditional prosthetics as it allows for higher levels of customization at lower production costs. This project used Design Science Research (DSR), which incorporates theory, artifact development, creativity and innovation as a methodological approach. This project investigates the impacts of 3D printing technology on gendered design prosthesis to rehabilitate identity, confidence and independence of women in low and middle income countries.

**Outcomes**

- 11 upper limb mechanical prostheses printed with improved aesthetic design and strength donated to 10 women and girls.
- 2 breast prostheses 3D printed in silicone and TPU 95A printing material to create a lighter product was donated to 2 women.
- 1 ear prosthesis was printed and donated to 1 woman after experimenting with different moulds and colours for different skin tones.
- Developed a prototype for the “Mariana Project” which was a project to develop prostheses for a 3 year old girl born with a congenital malformation of both arms.
- Developed a Perineal Elasticity meter prototype to be able to measure the perineal diameter in pregnant women.
- Numerous articles were published, as well presentations and workshops were held by the research team such as “Collaborative Research for Social Inclusion”, “Digital Catalogue of 3D upper limb prosthesis with customization of colours and characters”, “A conversation about gender innovation”, and “3D printing in healthcare”.



1. 3D printed upper limb prostheses.  
2. Ear and nose prototypes and prostheses.

**Methods**

- Developed a form for donation of an upper limb prosthesis for women and girls to submit. 10 women and girls were chosen for prosthesis donation.
- Held meetings with the chosen applicants to evaluate which activities they intend to use the prosthesis for, discussed the management of expectations, measured the non-amputated limb, and discussed the psychological and occupational therapy options available.
- After applicants received their 3D printed upper limb prostheses, multiple appointments were organized with an occupational therapist and psychologist to help applicants learn and adjust to their new prostheses. These sessions also allowed the researchers to investigate what improvements need to be made for better grip, comfort and aesthetic.
- Breast prosthesis prototypes were developed in three ways. First by obtaining a 3D breast model through digital services, second by using photogrammetry software to reconstruct the breast from photos sent in from 2 participants in need of a prosthesis, and lastly by scanning a mannequin and reconstructing the breast from the scan.
- From the different models, researchers printed the breast in silicone but noticed it was too heavy so new materials were explored such as TPU 95A, a material that was more flexible, lighter and softer. Similar process used for nose and ear prostheses.



1. Measurement for upper limb prosthesis.  
2. Occupational therapy for children using their new upper limb prostheses.  
3. Scanning and reconstructing breast prostheses prior to 3D printing.

**Lessons & Future Directions**

- Further research has begun on making aesthetic prostheses with materials more resistant to external reactions.
- Developing more partnerships with cancer hospitals outside of the region in order to produce more upper limb, breast and facial prostheses for more people in need.



Occupational therapy session for woman who received an upper limb prosthesis.



**Team**

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*“One of the things I am still learning is that a prototype doesn’t have to be physical.”*

— Khalil Elahee

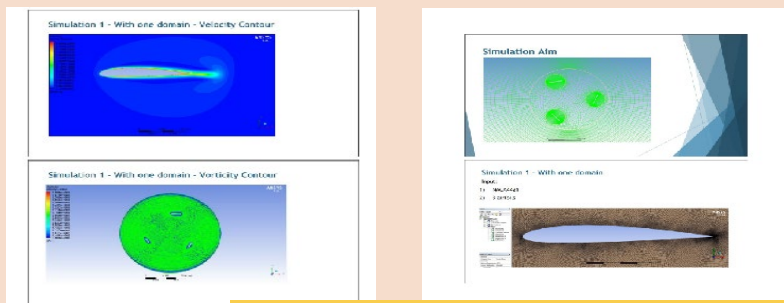
## ID71 Developing small wind turbines with local women for domestic use in Mauritius



The energy transition to renewable sources, along with energy efficiency and management, are areas where women should be engaged actively. This research project aims to design and develop a prototype in the form of a computational model for a system using a vertical-axis wind turbine which can later be scaled-up for domestic use in Mauritius and other small islands. The key research question is to determine how the integration of Gendered Design in the context of small-island economies, with the case of Mauritius in particular, can be achieved using numerical simulations and optimization techniques for the latter application. As such, the efficiency and performance of a small-scale Savonius vertical-axis wind turbine under various wind speeds typical of the Mauritian environment has been numerically investigated.

### Outcomes

- The project has been listed in the Mapping of Research and Innovation with Sustainable Development Goals(SDGs) for our University.
- The topic of Gendered Design has now been integrated in the syllabus (just like environmental, sustainability or safety considerations adopting a conversation approach with learners around the consideration given to gender. Not just through aesthetics or ergonomics, but as an integral part of the design concept definition process.
- Gender consideration in renewable energy recommendations made towards achieving 60% renewable energy in power generation by 2030 was included within a Position Paper from the Faculty of Engineering, proposed by a team including the Principal Investigator.



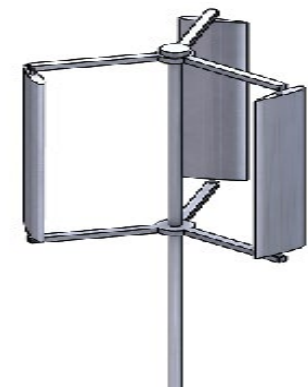
Left to right: Numerical Simulation using SolidWorks/Ansys Fluent

### Methods

- A two-level survey was conducted to understand gender-based energy behaviours. The Level 1 survey was comparatively more general and was performed across the Republic, including the island of Rodrigues. The Level 2 survey, on the other hand, was relatively more detailed and particularly focused on regions where a low response rate was recorded from the Level 1 survey. The need for a bottom-up approach engaging the population, in particular households’ women, was largely satisfied by the conduct of these elaborate surveys in a two-tier approach.
- Computational modelling was used to design and assess the performance of a Savonius vertical-axis wind turbine under various wind speeds typical of the Mauritian environment.
- The numerical investigation of airflow across wind turbine blades is performed in a commercial CFD solver, Ansys Fluent 20.2. This software was purchased under the Royal Society DFID Africa Capacity Building Initiative, along with servers and workstations, for a project now completed successfully by the Sustainable Energy Pole of Research Excellence of the University of Mauritius under the leadership of the Principal Investigator.

### Lessons & Future Directions

- Putting less faith in the effectiveness of numerical approaches is something that could have been done differently. Although incredibly effective in many applications, the limitations of such procedures are well understood since we deal with people and uncertainty so frequently in real life. Gender is important in design, although it may not always be based on computational methodologies.



A Vertical Axis Wind Turbine



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**Institution**

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**ID53** A case study of clothing design considerations of low-income, menopausal women in Brazil



As in many societies, in Brazil, middle-aged and low-income women are subject to marginalization caused by social and gender inequality. This reality underlies the construction of negative stereotypes associated with the devaluation of aging female bodies and beauty. Clothing, contributes to the perception of belonging and acceptance in the social environment. When the issues of aging, gender, and economic vulnerability are present, these judgments can further feed the construction of depreciating stereotypes of women. Recognizing the particularities of these women and their demands is essential for the development of clothing products that can contribute to self-esteem and social belonging, democratizing the actions and design solutions. Thus, this investigation had as a main objective: to understand how middle-aged and low-income women perceived the biopsychosocial factors of aging, and how they influence the factors of usability and social representation through the bias of gender construction.

**Findings**

**Aging Perception**

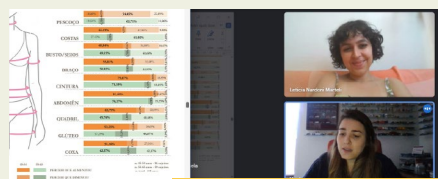
- Despite the stereotypes, women seemed more aware about menopause, evaluating it with more acceptance.
- Anxiety, insomnia, and fatigue were the symptoms mostly mentioned.

**Perception on body change**

- Participants noted changes, especially in the waist and abdomen, which creates discomfort and embarrassment.

**Their relationship with fashion and clothing**

- Most participants commented on avoiding tight clothes, especially around the waist, expressing embarrassment on clothing that is too tight or revealing. Nevertheless, they despise loose and baggy clothes.
- They admit using accessories to help them create a more curvy silhouette, besides that, they prefer clothes that provide them with a sense of respect and social integrity.
- They believe in the individuals' freedom to choose what is more adequate and comfortable, denying ephemeral trends and marketing pressure.
- Fashion is associated with individuals' styles and it is supposed to create happiness, well-being, and a sense of belonging.

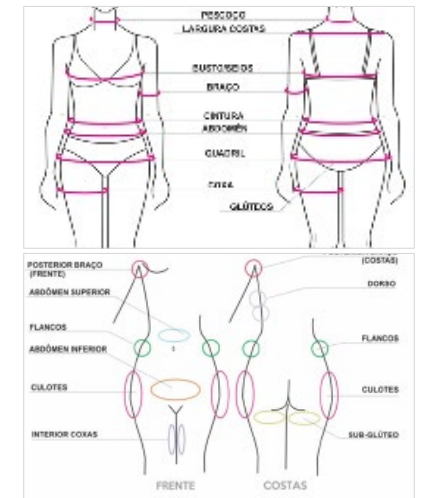


Data analysis during a virtual meeting.

**Methods**

This study used a generative approach, combining qualitative research techniques with quantitative methods, which occurred simultaneously by means of a questionnaire applied in a structured interview. To try to understand multiple complex power relationships, the questionnaire was broken into 4 separate distinct parts that investigated the following aspects:

- Firstly, the socio economic and demographic aspects of the participants.
- Secondly, reproductive (or non-reproductive) stage and about their perception of aging and menopause.
- Thirdly, explore the perception of middle-aged women regarding the body and aging. Here only open questions were used. To help them identify possible body changes, two drawings with illustrative references to body parts were used.
- Finally, the relationship that women have with fashion, especially clothing. Focusing on their relationship with fashion and their way of dressing.



The two images were used as part of the survey conducted with middle-aged low-income women in Brazil about perceptions of their body.

*“In general, gender studies call for more precision and sensitivity due to their multidimensional nature.”*

— Érica Neves

**Lessons & Future Directions**

- Including the female perspective in designing clothes for women with menopause is essential as designers can create clothing designs based on style and size that address the changes in a female's body, which will allow women to feel more comfortable and confident in the clothes they wear.
- By using the data that has been collected from the small sample in Bauru, there is potential to expand the project to larger regions to gather more data and to reach more women.



Data collected about body changes. Measurements through questionnaire visualized using a body visualizer software.

### Design Research Society (DRS) Conference | 26 June to 2 July 2022

Chiara Del Gaudio, GDS Investigator, and joint PIs Bjarki Hallgrímsson and Dominique Marshall, wrote and presented a paper for the Design Research Society (DRS) Conference, held in Bilbao, Spain, 2022. The paper abstract is provided below and can be [read in full here](#).

The paper recognizes that the GDS research program was made possible with the support of funding from IDRC, and it required us to design and manage a global research endeavor extending across three continents, consisting of distinct projects with shared goals and different disciplinary backgrounds, sectors, and socio-cultural contexts.

#### Supporting research on gender and design amongst STEAM researchers in the souths: A case study of subsumption in design methods

##### Abstract

This paper tells the story of a research program that subsumed the approaches of design, arts and social sciences to enhance gender aware and inclusive research amongst twenty academic teams of Science, Technology, Engineering, Arts and Mathematics located in the Souths. These are the findings of our empirical exploration to support the emergence of a transdisciplinary area of research and practice which we defined as Gendered Design. The key factors that proved crucial to overcome disciplinary boundaries and catalyse processes of empowerment are: theoretical and methodological openness, design-driven strategy and experimentation, as well as a holistic and affective approach to collaborations and relationships.

##### Keywords

gendered design, participatory design, STEAM, transdisciplinarity

##### Citation

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PI Bjarki Hallgrímsson presenting the paper at the DRS conference in Bilbao, Spain. Unfortunately, Chiara Del Gaudio who was to join Bjarki on stage was sick with Covid.

### Group 4


Here we have two projects from Africa and two from South America. The similarities are striking between the two projects in the two different continents. In two of them we have women's issues that are particular to the urban environment in either continent, while the other two are focused on very remote and hard to reach rural areas in both continents. You will see how women in the city of Dar es Salaam are reinvigorating and growing the batik industry in Tanzania, while women in Cordoba, Argentina are seen discovering and making very clear the urban realities through a process of cartography.

In the rural projects we see researchers engaging with remote communities in the island district of Ghana, where they explore access to the electrical grid and the other project focusing on building techniques by women in rural areas of Brazil including the Amazon.

In terms of the outcomes these projects we also see prototypes that embody traditional indigenous knowledge, for example natural dyes for making batiks and a fabric carrier case that includes graphic images and serves as a manual for women's construction knowledge.

- ID33

Improving access to financial services for women in Ethiopia

- ID79

Modernizing the batik industry to improve income for women in Tanzania





- ID88

Developing new construction techniques based on the work of women in Brazil



- ID37

Exploring urban childcare infrastructures to support women's autonomy in Argentina





You can watch the project videos in this group on the GDS YouTube channel through this playlist:  
<https://youtu.be/aA4mpz8KQNg>

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*“If we just put something that really pushes information to women regarding financial issues, eventually women become more financially literate. Financial literacy is the basis to gain access to finance, to use that finance and improve livelihood.”*

— Getachew Mengesha

# ID33 Improving Access to Financial Services to Enhance Women’s Economic Empowerment in Ethiopia



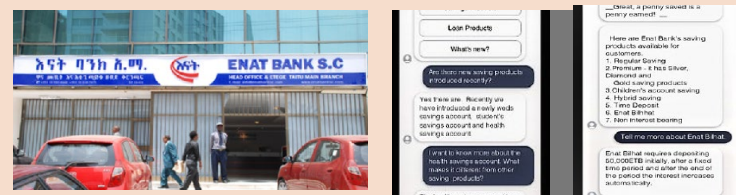
Financial literacy is low amongst women in Addis Ababa, Ethiopia, resulting in increased poverty stemming from the lack of command over their own economic resources. This study investigated the financial literacy of women and explored the sociocultural and psychological factors that hinder or encourage utilization of financial opportunities open to women. In partnership with Enat Bank in Ethiopia, research was conducted to devise technological solutions, such as a prototype Chatbot application, to facilitate the ease of access to financial services and improve financial literacy.



Dr. Getachew Mengesha presenting a mobile application that will improve access to financial services for women in Ethiopia during a validation workshop held on September 23, 2021.

## Outcomes

- Partnership with Enat Bank was formed to conceptualize and develop a system based on gender analysis, gendered design and gendered innovation so as to improve women’s access to financial services.
- Analysis of the data collected regarding the financial literacy of women in Ethiopia led to four published reports: ‘Social cognitive theory and gender analysis framework’, ‘Overview of Ethiopian national culture’, ‘Gender roles and perspectives’, ‘Gender and financial inclusion’, and ‘Gender design issues and implications.’
- The data collected helped to identify important functional requirements for designing and developing a prototype. Chatbot application developed to allow women to easily access their accounts and any financial services that could benefit them. The application is undergoing security testing before officially being launched at banks in Ethiopia.



Left: Enat Bank building in Addis Ababa, Ethiopia. Right: Graphic of the prototype Chatbot application that allows the user to easily access their accounts and other financial services.

## Methods

- A project inception workshop held Nov 28 - 29, 2020, at Adama city brought together the project team, gendered design experts and stakeholders who developed data collection instruments used for initial research into the issues of low financial literacy within Ethiopia.
- Data collection instruments were developed using Social Cognitive Theory (SCT) as a theoretical lens and Participatory Design (PD) as a methodological approach to identify gendered design considerations prior to producing a technological solution.
- Interviews were conducted with four departments of Enat Bank: Women Business Solutions, Business Development and Innovations, IT, and Credit and Lending. The partnership with Enat Bank provides a platform for creating a technological solution that allows women

## Lessons & Future Directions

- The Chatbot Application is currently undergoing a security evaluation before the product is able to launch in banks.
- The study has shed insight for reducing stereotypes developed over the years regarding women’s level of

## Feedback and comments from ID33

### Getachew Menegesha (PI)

“GDS is one of the well organized program I have ever participated. The program gave me a new insight about Gendered Design. Furthermore, I have got the opportunity to dive deeper into Ethiopian history and culture and have managed to gain sound understanding how gender based social strata and occupational classifications evolved over time. This has helped me to know how Ethiopian patriarchal culture favored men. Women also tend to accept role defined to them by the society. As a result, the majority of women in rural and sub rural areas and even many urban areas believe that women need to work at home and handle household activities while men need to work outside and generate income to the family. Eventually, this mind set led women to be economically dependent. As the economic challenges unfold, men became unable to provide what the family needs. This has forced women to engage in small businesses to support the family. These days, millions of women in Ethiopia are engaged in micro business activities. The challenge we noted in this project was that women engaged in these micro business ventures have low financial literacy. This project explored how

to access their accounts, access financial services, and improve their financial literacy.

- Results from the structured questionnaires, interviews and data analysis were incorporated into the design to develop a paper prototype of the Chatbot application which was further enhanced after users were able to evaluate the gendered design of the prototype firsthand.
- Chatbot application was developed from the paper prototype that addresses the concerns and desires of the intended users. The easy-to-use text application allows women to access their finances and learn more about financial services instantly.



Representatives of Enat bank discussing the next steps of the project in January 2021.

participation in science and technology domains.

- The involvement of women researchers in this project has helped tremendously to articulate the challenges women face in Ethiopia, clarify misconceptions, and demystify the widely held view regarding women and computer systems development.

best financial literacy contents and knowledge would be delivered to women.

Several readings, seminar talks, and workshops have shaped my GDS research process tremendously. To mention the most prominent ones; First, the article on Gendered innovation by Schiebinger (2014) was phenomenal to conceptualize well the notion of gendered design. In addition, this piece of work helped to shape the application of gender analysis framework in the domain of science and technology. Second, the social cognitive theory Bandura (2006) provided an overarching framework of the study portraying how internal and external factors surrounding a person shapes outward behaviors. Third, the Participatory Design approach such as (Hartson & pyla, 2019) provided us a solid methodological ground to foster the full involvement of women and end users throughout the artifact design and development process. Fourth, the notion of discrimination by design (Groeger, 2016) provided an insight how engineering designs leads to discrimination by economic class and social status.

I am preparing to publish key findings of the study and intend to explore further gendered design related phenomena.”





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**ID79** Modernization of the Tanzania's Batik Industry as a Potential Source of Income for Unemployed Women: The Case of Dar es Salaam



Batik is an artistic technique that is created by applying wax to fabrics in specific patterns, followed by dyeing the fabric repeatedly until it has achieved the desired design and colour. In Tanzania, the batik industry is dominated by small and medium firms, mainly led by women in both rural and urban areas who practice the art of batik usually in their own homes. Through survey and interview methods, this study identifies the many challenges associated with the industry, particularly with the techniques that are currently used in the batik industry in Tanzania. Upon analyzing the data from the survey and interviews, modernized and standardized batik techniques were introduced to the industry for the purpose of assisting batik producers in creating high quality and sustainable batik products with potential to be sold in international markets.

*“We want that technology to be specifically for the women. We want to modernize it, but we want it to be beneficial to these women particularly.”*

— Pendo Bigambo

**Outcomes**

- Development of a standardized method to eliminate issues associated with using synthetic dyes which require large amounts of chemicals that are often detrimental to the general health of batik producers.
- Reduce use of chemical dyes by developing techniques that utilize natural dyes extracted from onion peels and turmeric root for batik dyeing. Using natural materials also reduces the amount of chemical waste that is disposed of by the batik producers.
- Workshops encouraged networking and sharing of knowledge amongst the producers of batik in Dar es Salaam, Tanzania, leading to potential business developments within the community.
- New standardized methods allow batik producers to create products with improved quality and potential repeatability. New patterns and designs attract more customers, as well as allow batik products to access new markets.



Top: Dyeing batik using natural dye extracted from turmeric root. Bottom: Participants tying stamped batik in preparation for dyeing during workshop two: standardized batik dyeing techniques.

**Methods**

- Data was collected through interviews and a questionnaire to establish the current state of the batik production industry in Tanzania. After analyzing the data, women who produce batik within the Dar es Salaam region were invited to two workshops that would introduce new, efficient, and safe methods of producing batik. There were 18 participants for workshop one and 25 participants for workshop two.
- Researchers developed new technology and standardized methods to promote safety, sustainability, and producibility within the batik industry. These developments included producing a folding table to increase workspace, and using natural dyes extracted from onion peels and turmeric roots in order to reduce dependency on chemical dyes.
- The first workshop, in June 2021, focused on developing new batik motifs and patterns as well as establishing challenges that women batik producers in Tanzania face. Local batik producers worked with professional graphic designers to co-develop new patterns and designs.
- The second workshop, in July 2021, invited participants to produce batik using the designs developed in workshop one. During this workshop, participants were able to practice using the newly standardized dyeing methods to see how they compare to conventional methods.



Top: Dr. Bigambo demonstrating standardized batik techniques by stamping patterns on to fabric during workshop two.  
Bottom: Participants displaying batik results after stamping and dyeing the fabric with natural dyes.

**Lessons & Future Directions**

- Researchers and participants are working together to produce a manual which will contain all batik dyeing procedures and techniques that were developed during the research and workshop periods. The manual will be available in two languages, English and Swahili, so as to reach a large group of users. Proposed publication is mid-September 2022.
- Two journal articles on the status of the batik industry in Tanzania and on the application of natural dyes in batik dyeing are being prepared. This is in response to the lack of data available prior to the start of this project. Proposed publication mid-August 2022.



Workshop participant showing fabric dyed using natural dye extracted from onion peels, while varying the mordanting agents to enhance certain colours.



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*“Children were always present at our meetings and we prioritized caring for each other as a feminist radical methodology.”*

— Diana Helene Ramos

**ID88 Technologies for another form of construction: experiences by women from popular movements**



The research project is based on a housing movement called “Mutirão” which emerged at the end of the 1980s, where residential areas were constructed on the outskirts of populated cities in Brazil. This collective activity is usually led by women (around 80%) who organize, coordinate, and work on-site. This study deploys the female perspective that has been systematically erased by colonial and patriarchal orders, to redesign construction sites, materials, tools and techniques and deconstruct the barriers created by sexual division of labour. Through participatory processes and workshops, this study uses female perspectives to resurrect ancestral construction techniques, such as the Pana: a fabric that serves both as an object for daily activities such as for carrying things around, and as a manual that outlines technologies and construction techniques from women in different territories of Brazil.

**Outcomes**

- Increased understanding of construction and presentation technologies based on participatory processes that included women in the radical re-definition of what is seen as important to the women.
- The final outcome was Pana a feminist technological tool, containing instructions on the ancestral technologies that have been central to the territories where these women inhabit.
- Articles, lectures and public debates in national and international academic seminars and congresses. A few examples: Article included: “An essay on capitalist urbanization as technology: coloniality, racialization and cisheteropatriarchy”. Presentations included: “Technology, work and care: technological resistances in the Serra da Misericórdia” by Amanda Azevedo, “Decolonizing Land: Collective Property in Brazil and Mexico” by Kaya Lazarini, and “Weaving Nets and Resistance: Analysis of urban living conditions of fisherwomen at Colony Z-25 in Porto de Pedras-AL” by Bruna Oliveira. All team members of the project.



Left: Pana tied in many ways by members of the team Right: Diana on beach showing Pana

**Methods**

- Inspired by workshop participants, and Ursula’s Le Guin text on the carrier bag theory, they moved towards designing a piece of fabric, which would be the manual of the most important technologies for each of the collectives, connected by the trees that inhabit their territory.
- Through relationship building, debate on technology and gender and a survey on workshops and participatory methodologies a collective cartography workshop was developed.
- The cartography activity had two phases, first individually mapping and then a group discussion on visions of the territory through the making of a collective map.
- Pictograms were used to create unity and ease synthesis between all three workshops.
- The results were analyzed for commonalities between the maps and information gathered. Then the team (along with local articulators) identified and defined technologies that would benefit, in different ways, all the communities.



Left to Right: Making of the collective map in Serra da Misericórdia Workshop; Pictograms in Quilombo Santa Rosa dos Prestos; Zica Pires presenting her individual map which would inspire the Pana

**Lessons & Future Directions**

- They want to have a final activity, where they will present the Pana created to the territories to enable an collective evaluation of the process.
- Additionally, they are interested to see what the consequences of bringing this creation into the world will be, they trust that it may serve as inspiration for many women’s actions in this common territory.



Serra da Misericórdia Workshop



Córdoba,  
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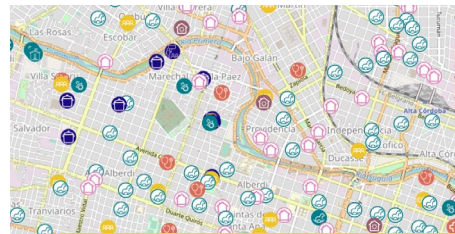
**All members of CISCSA  
Feminist Cities**

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## ID37 Exploring urban care infrastructures to support women's autonomy in Argentina



This research addresses the issue of care work as mostly assumed by women and focuses on the unequal distribution of care services and infrastructures in fragmented cities. This project is located in the city of Córdoba, in the underserved neighbourhoods of Marechal, Villa Páez and Alberdi. The project utilized quantitative and qualitative mapping to understand gendered urban experiences related to care, and how these are omitted in current urban planning discourses.



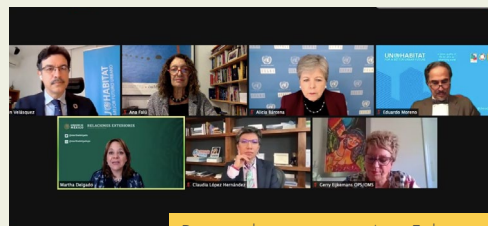
Capture of interactive map "Cartographies of Care". Please visit: <https://mapee.com.ar/ciscsa/mapadelcuidado>

*"We think that we must reflect on urban design, on the ways in which cities are thought" ... "There is an absence of the gender perspective, of the gaze that incorporates women in their needs."*

— Dr. Ana Falú

### Outcomes and Findings

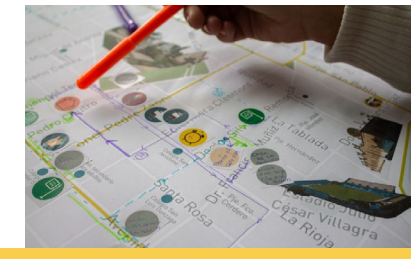
- They created an interactive digital map using their quantitative research which demonstrates the relationship between financial inequality and access to services and infrastructures of care in Córdoba.
- Their research highlights the omission of women in urban planning currently, and how including their perspectives could address territorial inequalities in access to care.
- They have developed recommendations for municipal administration and shared their discoveries through social media and technical and professional training curricula.
- The project has garnered interest at the national level and the international level through the UN Habitat and UN Women.



Principal investigator Ana Falú speaking at UN Habitat on June 18, 2021

### Methods

- The quantitative research was based on studies of socio-demographics, of municipal politics, the relevant literature, and existing cartographic databases.
- They worked with women involved in care at either the level of the home or the neighbourhood. They conducted interviews and organized workshops where participants mapped out their everyday routes and the services they interact with.
- The project included participative methodologies in order to question the supposed neutrality in urban design, incorporating the perceptions and demands of women to understand their needs and priorities regarding infrastructure and services of care.



Images left to right: Various images from workshops with women from Alberdi, Villa Páez, and Marechal mapping their daily routes and care services in their area.

### Lessons & Future Directions

- They are part of Red Pueblo Alberdi, a network which includes neighbourhood centres and academics, and have signed a Mutual Collaboration Agreement with the Municipality of Córdoba City, facilitating new dialogues and exchanges.
- The project has contributed to the expansion of funding and scope for the work in Care and Territory of CISCSA, opening the door to new research and more collaboration with local communities.

### Feedback and reflections from ID37

#### Prof Emérita Arq. Ana Falú (PI)

"It has been a great opportunity to participate with a team of excellent professionals as Principal Investigator and Executive Director of the Feminist NGO CISCSA in this GDS Program, as it enabled CISCSA to produce and disseminate valuable and innovative knowledge on the design of feminist cities, with a particular focus on care work in the city of Córdoba. The team and myself, really enjoyed working together with IDRC and learning new things from the wide range of projects that aim to contribute to a more gendered and innovative design.

By receiving the support of the GDS program, me and my colleagues were able to continue working on deepening

our knowledge on the daily lives of women and the ones they take care of in their city and neighbourhoods, in order to provide insights and evidence into the critical conditions of low-income women in the city. But it also contributed to strengthening processes with us as researchers and with the women organizations in the territory and the opportunity for sustaining actions that influence local policies. Therefore, thanks to the support of the GDS Program and Network, we could contribute to our main goal: to challenge the neutral approach of urban planning, as well as the relevance to include women in their diversities from a feminist approach.

The challenging context of COVID-19 has been an unexpected and very unusual fact that occurred during this study. However, it has been a continuous learning process with positive and enriching results. It required a high level of

creativity of our research team to rethink our planned activities and strategy to manage to obtain the planned goals of this study in a safe and useful way. A specific example is how we made a positive use of the rising popularity of online events during the pandemic. By participating in a wide range of seminars, classes and courses, me and my colleagues were able to disseminate the project and raise more awareness among different types of audiences: students, politicians, and other organizations of civil society. We calculated that we reached more people in this way than usual!

The impact of the Covid-19 pandemic, highlighted pre-existing structural situations of inequality around the social organisation of care, the centrality of care for the reproduction of life and economic development, and the impact that this distribution has on the exercise of women's rights, which responds to the sexual division of labour. Our interactive Map 'Care and Territories' provides evidence regarding the link among territories, inequalities and care provision; an instrument that allows us to argue about the omission of women in their diversities in urban planning and

enables us to discuss how decisive urban planning and the location of services are when women and their specific needs according to assigned roles are incorporated into the analysis. It is complex and has a high standard, which turns it into a tool for new gendered urban planning knowledge to evidence the conditions of inequality in the provision of care in territorially based information.

Thanks to the support of the IDRC and other small funds, we have been able to create a broader work area within our NGO CISCOSA denominated 'Care and Territories'. We aim to deepen this study by producing more innovative knowledge, continue our work with local women's organizations and advocacy work in this topic on different scales. Currently we are supported by the Open Society Fund and looking for more economic resources to sustain this work. Please visit our webpage to read more: <https://www.ciscsa.org.ar/cuidados>




## Group 5

This group of four projects show the uncertainty of a bus stop, the darkness of a family room, the impossible weight of an electricity generator, the loneliness of a suburb for new dwellers. All the images seen in the poster and the videos are of specific locations, taken by colleagues of the GDS and their graduate students, in the places where communities they know spend their days and shared their knowledge. Keep an eye on the boats, papers and pens, phone screens and meetings, all the tools they used to meet folks sitting in a public place, talking to the local TV, holding a university seminar, speaking as they peel huge vegetables. All this to gage how a technology mindful of gender, generations, families, and homes could go about making some places more independent, less lonely, more welcoming to all ages, better looking and better run.




At the end, you will see the policy brief, inclusive community engagement, the busy kitchen with the first harvest of the adjacent garden, and the coloured map, which colleagues and students from Ghana, Nigeria, Columbia, and Mexico have patiently helped to bring about.

- ID40




Assessing the impact of solar panels to improve energy access for women in rural Ghana




- ID80





Reimagining urban territories for women's autonomy in Colombia




- ID61

Developing innovative urban design strategies to combat gender violence in Mexico




- ID65

Constructing an eco-friendly generator for low-income female artisans in Nigeria

You can watch the project videos in this group on the GDS YouTube channel through this playlist:  
<https://youtu.be/6lPrOgmdbJA>



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*“When women gain access to clean and affordable energy services they gain tremendous improvement in their health and opportunities to earn an income are enhanced.”*

— Samuel Gyamfi

**ID40** Assessing the impact of solar panels to improve energy access for women in rural Ghana



The government of Ghana aims to provide energy access to communities with populations of 500 and above, but isolated communities (rural or island) have no access to electricity. This case study explored the factors enhancing women’s empowerment through energy access and investigated productive uses of energy in informal food preparation and processing sectors owned by women and vulnerable populations. The project assessed the impact on energy access, gender, and the political economy of the energy sector in these communities and explored how to enhance the role of the private sector in scaling up energy access for all.

**Outcomes**

- The association between gender and electricity access was statistically significant ( $p < .05$ ). These results indicated that electricity access among the participants was more skewed towards males than females.
- The project provided research data support to two female postgraduate students from the Regional Centre for Energy and Environmental Sustainability. The team was also able to establish working relationships with community members and opinion leaders.
- A critical gender audit of existing energy policy in Ghana revealed that the country’s energy policy makers were beginning to acknowledge the need to mainstream gender needs into energy policy, although, there has not been a deliberate effort to lessen the burden of energy poverty suffered by women.
- While the study tried to maintain a focus on women, the results of the quantitative data gathered indicated that both genders suffered serious electricity access challenges.

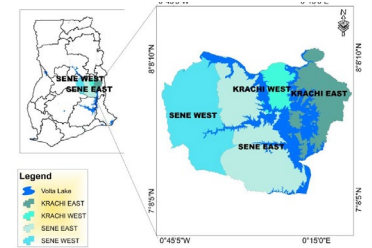
The primary source of electricity		Gender		Total
		Male	Female	
Batteries	Count	3	1	4
	% within Primary source of electricity	75%	25%	100%
Community-based grid	Count	130	48	178
	% within Primary source of electricity	73%	27%	100%
Solar home systems	Count	25	8	33
	% within Primary source of electricity	75.8%	24.2%	100%
Others	Count	4	1	5
	% within Primary source of electricity	80.	20%	100%
Total	Count	162	58	220
	% within Primary source of electricity	73.6%	26.4%	100%



Left: Gender of the head of household versus electricity access  
Right: Atafiam Number 2 Island Community - community members welcoming research team

**Methods**

- The research was constructed based on Community-Based Participatory Research. The method integrates Indigenous value and belief systems into the interventions and treats diverse experiences within a community as an opportunity to enrich the research process.
- Data was drawn from a household survey of 604 households from 15 island/lakeside communities in four administrative districts in Ghana. To assess ‘the gender-differentiated electricity service requirement of island communities’, ‘how much electricity is required to propel socio-economic development’.
- Qualitative data was gathered through semi-structured interviews, key informant interviews, participatory focus group discussions, and a desk review of reports, policy documents and research articles. The inquiry looked into ‘how gender-imposed constraints affected women’s chances to benefit from the productive use of electricity in island/lakeside communities’.



Top: Research team members on a field visit to island communities; bottom: Map of study area

**Lessons & Future Directions**

- Access to modern energy services have the ability improve the socio-economic development of these disadvantaged communities.
- The team continues to investigate policies and practices that perpetuate inequities in access to electricity in island/lakeside communities along the Volta lake while empowering traditionally marginalized groups until all electricity access related inequalities are eliminated.
- The team is preparing towards engaging community members in focused group discussions in order to get to the root cause of all forms of limitations in accessing electricity due to geographical location.



Research team members collecting field data in March 2021



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**Círculo de Mujeres Aisha**  
Participating group

**Casa B**  
Participating group

**Proyectar Sin Fronteras**  
Participating group

**Semillero Políticas Sancocho**  
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**Institution**  
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**ID80** Reimagining urban territories for women's autonomy in Colombia



This project builds on ongoing work in the neighborhood of Belén in Bogotá to resist gentrification and redevelopment efforts through the creation and expansion of community spaces with a gendered perspective. Researchers from Universidad Jorge Tadeo Lozano worked with a local group of women, the Circle of Women Aisha, to create a community kitchen and expand and renovate an existing community garden at a local community space Casa B. This project focuses on domestic spheres to argue that they are important spaces of feminist politics and community knowledge.



Team members cooking together in the community space.

*"[We must] see the kitchen not as something about and for women but rather as a stage upon which care takes form as a human value that can be practised by persons of every gender."*

— Angélica Fabiola Bernal

**Outcomes**

- The creation of a community kitchen and a community garden for use by residents of the Belén neighbourhood.
- Development of their "Feminzine" (Feminine + zine) to communicate the project's goals, philosophy, and progress.
- Creation of a documentary film about their project's methods and the community spaces.



Filming of documentary "Apron philosophies".



The new community garden.



Kitchen appliances being installed in the community kitchen.

**Methods**

- Collaboration was crucial to the design methods of this project from the very beginning, and members of the Circle of Women Aisha were involved from the very first planning stages.
- It was community members who asserted the kitchen should meet all official regulations to ensure it could be used for commercial purposes in the future.
- The Feminzine was created through collaborative workshops, and they include reflections from both team members from the community and those from the university.
- The project's social media presence also highlights the knowledge and expertise of community members.



Left: Members of the Circle of Women Aisha cooking together. Middle: Team members working together to create the community garden. Right: Team members designing the project's logo.

**Lessons & Future Directions**

- The team is still working together on supporting community initiatives.
- Their dreams include connecting with projects elsewhere to learn from collaborative approaches in other cultural contexts and to share their own experiences with this kind of gendered design.



Project member discussin the planning board for the community kitchen

**Feedback and reflections from ID80**

**Adriana Maria Botero Velez (PI)**

"On behalf of the University and in my personal name, I would like to express my immense gratitude to you for allowing us to develop this Research - Creation process. It is incredible and still indescribable the power of what happened in these two years of interdisciplinary work. In our case, this project marks a very important milestone to deepen the incorporation of the gender perspective in the teaching of design.

Personally, the lessons learned are immeasurable. As a woman, as a researcher, as a professional, as a teacher, this process meant the reaffirmation of political and ethical convictions of the role of education in the creation of conditions for a more humane, loving, respectful and peaceful world with social justice."



**Team**

**Erika A. Rogel Villalba**

Principal Investigator  
Social design, Crime prevention

**Leonardo Moreno**

Co-Principal Investigator  
Interdisciplinary design approaches

**Lourdes Ampudia**

Co-Principal Investigator  
Economy, Gender studies

**Institution**

Universidad Autónoma  
Ciudad Juárez

**ID61** Developing innovative urban design strategies to combat gender violence in Mexico



This project developed seminars with professors, undergraduate, and graduate students from a variety of disciplines in order to come up with innovative design approaches to the issue of gendered violence in Ciudad Juárez. The participants studied the literature on gendered violence in the city and created proposals for designs with gendered violence as the central focus, which included plans for bus stops, experiments in the use of storytelling in design research, and infographics on sexist attitudes among the design students at the university.

*“Design can do more than just cover products or create purchasing needs. If it can do that, then it also has the power to change ways of thinking, ways of working, ways of doing.”*

— Erika A. Rogel Villalba

**Outcomes**

- Academic output on their interdisciplinary approach to gendered design
- Twelve student proposals for designs combatting gendered violence in Ciudad Juárez in various forms (including sexism in the workplace or among peers, danger to women on public transportation or in the street)
- The mixed-level and interdisciplinary seminar itself, which is continuing to work collaboratively on issues of gendered violence in Ciudad Juárez.



A proposal draft of a new bus stop design by Ariel Alonso de la Torre Ramos.



Top: Dr Leonardo Moreno, Dr Lourdes Ampudia, Guadalupe Chihuahua Sida. Bottom: Dr Erika A. Rogel Villalba, Zennia Ruiz, Raúl Alejandro Sarandigua.



Stills from video educating on everyday sexism created by Pamela Marina Nevárez González and Erika Rogel Villalba.

**Methods**

- Seminar meetings to define concepts of gender, sexism, and their relationship to urban space and design. The team was then split into two: one group which focused on public space and another which focused on social design
- Proposals by each team member based on the discussions and collective research, as well as further development of these proposals with ongoing feedback from the team.
- Empowerment of each member to share their analysis and contributions, regardless of university level or discipline. Emphasis was placed on creating a democratic and even seminar dynamic that did not privilege the professors participating.

**Lessons & Future Directions**

- The team has plans to collaborate more closely with local communities outside of academia in the future
- Broadening their network of Latin American scholars and designers tackling issues of gender
- Exploring how they can develop even further the interdisciplinary aspect of their project’s approach to gendered design.



A seminar meeting in progress. Top left to right: Dr Janneth Mendoza, Dr Leonardo Moreno, Valeria Sánchez. Bottom left to right: Dr Erika A. Rogel Villalba, Zennia Ruiz.



Edo,  
Nigeria

### Team

**Ese Esther Oriarewo**  
Principal Investigator  
Legal Officer

**Kess Obokhia Asikhia**  
Co-Principal Investigator  
Mechanical Engineering

**David Idiata**  
Civil Engineering

**Slyvester Omoruyi Barr**  
Electrical Electronics Technology

**Loveth Obanor-Obaseki**  
Socio-Psychologist

### Institution

Edo State Polytechnic, Usen  
Edo State, Nigeria

## ID65 Design and Construction of Gender and Eco-Friendly Fuel-Less Generator for Female Artisans in Nigeria



African civilization has traditionally been patriarchal, and this male-centered inclination permeates all facets of daily life, including the way we think about product design. Most of the user's centered design framework is very generic and lacks the inclusiveness that is expected to address specific related design issues. Gender-centered design, a particular user-centered design paradigm, has recently risen to the forefront of product thinking. This idea ensures that men and women receive the same benefits from policies and programs while preventing the continuation of inequality. The study used a descriptive and inferential statistical analysis for the questionnaire, and it used the House of Quality (HoQ) tool to map the engineering qualities with the Voice of Customer (VoC) that was retrieved from the participant's recorded utterance. The HoQ was later used to explore the design of a fuel-less generator prototype.

*"Before now I thought everything gender has to do with the gender based violence and gender abuse, gender intimidation. I actually did not align my mind to designs."*

— Ese Esther Oriarewo

### Outcomes

- The final House of Quality (HoQ) mapped the Voice of Customers (VoC) identified in the study with the suitable engineering characteristics used for the development of the fuel less generator.
- A proposal to incorporate a gender centered design component in the curriculum of design study course offered by engineering students in our Polytechnic Edo state Polytechnic has commenced. The research team is already working on the enrichment programme in the curriculum of design study course in our Polytechnic (Edo state Polytechnic) with gender centred component offered by engineering students in the Polytechnic.



Media report of the stakeholder workshop on Gender Design in Science, Technology, Engineering, Arts, and Mathematics

### Methods

- The first phase of the research involved stakeholder consultations that started with meetings with various artisan associations. This created awareness about the project and disseminated vital information to those who practice their trade in this area.
- The team also held a local town hall meeting, bringing together various key stakeholders such as artisans, Head of Government Parastatals and representatives from the general public to discuss the project.
- A User Study was conducted for the purpose of identifying gender problems experienced by the participants recruited for the study. This phase addressed the identified issues by way of re-designing the product.

### Lessons & Future Directions

- Organize a future stakeholders meeting to discuss findings and research insights with the community.

### Feedback and reflections from ID65

#### Ese Esther Oriarewo (PI)

" Prior to this research, I have never been involved with research that involves product designs, in the course of the research, my interaction with the artisans, stakeholders, my team members and other researchers during the various Lab Workshops training I discovered that most product designs are male biased, which is unfavourable to most female who are also end users of the product, therefore, product designs ought to be gender inclusive. As the Director of Centre for Gender Studies, I had always reasoned that gender has to do with equality, equity and fairness as it relates to the protection of rights of people but with this research, I have come to understand that there ought to be gender equality in design of industrial products to break the stereotypical fallacies that encourages bias of designs towards men. More importantly, being part of the GDS program enlarged my network, I got to meet different people from different fields which helped broaden my horizon. The shared knowledge and ideas went a long in enlarging my research skills. Worthy of note is Kerry Grace, our Program Coordinator I learnt patience from her, she patiently guided and encouraged us through the research and this helped me to exercise patience with my team members and even the Research Assistants when they lagged behind.

- Five (5) research questions and twenty-one (21) sub questions were raised in a questionnaire.
- The ranked VoCs were thoroughly examined by the expanded design team using Quality Function Deployment (QFD) tool and solutions. This process highlights the areas where priorities were to be assigned in product development.



Poster invite to the local interactive meeting with stakeholders



The local town hall meeting in action with a presentation from the project team

Relating with the artisans, especially the illiterate ones, is an experience I would not forget quickly as it made realize that everyone is important in their chosen field or vocation. Some blatantly refused to be videoed nor had their pictures taken based on the superstitious believe that we could use their pictures and videos for black magic. At the beginning of the research, we proposed a timeline for every phase of the research but unfortunately, the unexpected outbreak of Covid-19 which led to a total lockdown in year 2020, the EndSars protest and the security challenges in state distorted our plans and affected the research process and eat deep into our budget, for example, we originally planned to have a session of training for all our research assistants in one venue before sending them to the various locations for data collection but due to the lockdown, we had to organize trainings in the four selected locations and engaged more research assistance.

During the course of the project we discovered that product designs were biased towards men because of the stereotypical ideology that has become a norm in Nigeria. Thus we had to structure another questionnaire to address stereotypical ideologies. This helped us to remain focus in ensuring that the project was gender inclusive.

We are proposing to enrich some of the engineering and applied sciences related courses with gender flavour in Edo



State Polytechnic to create awareness of gender centred designs in schools. In the course of addressing salient related design issues from the data collected, we observed that further work that is beyond the scope of this current project could evolve as a follow up to this project, for example, the physically challenged gender centred design and rule based decision of stereotypical comments as applied to gendered centred design can be explored in a new study in the future. And to achieve this, funds are needed hence we have put together a gender centred based project design proposal in the highest funding body in Nigeria, the Tertiary Education Trust Fund (TETFUND) and if approved, we would be able to improve on the research design. "

**Obokhai Kess Asikhia (Co-PI)**

" It has been an interesting experience of being part of the GDS program. For almost 2 years working as co-principal investigator, it strengthened my knowledge in managing research activities of this magnitude. It has been a pleasure working with diverse set of people over these periods within and outside the country. The project had significantly impacted on my leadership quality within the period under review. I partly managed the efficient running of the entire project with the principal investigator. It wasn't easy, but it was a good learning process. In addition, in the course of the project, I have also strengthened various skills deployed at different stages of the project. My knowledge of prototyping activities was significantly enhanced as a result of the continuous iteration processes embarked on during this phase of the project. Furthermore, some of the collaboration tool used in the course of the project, like MIRO is still be used in some other project work that I am coordinating. Finally, the most significant impact of the project is actually on the awareness of gender centred inclusion in the subsequent projects that I have embarked on. I am naturally inclined to incorporate gender perspective to my work. This awareness has culminated in strengthening of our research group to do further awareness work of Gender centred design in our locality even after the conclusion of the project.

One very interesting, but unexpected fact that occurred in the course of the project was the difficulties the research team had at the data collection phase. Some of the participants bluntly refused to be recorded. They attributed their refusal on their superstitious belief.

One of the key learning that I personally discovered that had impact on the design and prototyping phases of the project was given attention to the feedbacks from the female folks. These feedbacks would normally not have been taken into consideration in most of the phases of the project.

The future goal is to sustain this awareness of the gender centred design project that has been created in our community. As a way forward, we (the research team) have put in for another proposal that is Gender centred in Nigeria. We also intend to sustain the network that we have built over this period working in this gender centred design project. "

**David Idiata (Co-PI)**

It was quite a tasking job. The experience was actually exciting due to the interaction we had with artisans and other stakeholders. Their excitement in the research of finding solution to the incessant power outages experienced by them in their businesses. On our part it was like a sense of responsibly been placed on us to help empower the artisans in providing the needed electricity to makes ends meet. Considering the harsh economic climate prevalent in the country. It like giving hope to the hopeless. During the research the team became bonded together in spite of our different background.

When we introduced to the 'House of quality' (HOQ)it was fun and we nicknamed our research group house of quality. Because it was the first time some of were hearing about it.

Again the HOQ (house of quality) was key in analyzing our questionnaire into voice of customers.

As a lecturer it has open my eyes on the need to continue my research along this line on renewable and affordable energy.

**Obanor-Obaseki Loveth (Team member)**

My experience of being part of this great project opened my eyes to so many things like being with the artisans listening to them talk and expressed themselves working with my team members, and the impact this great project had on me was I can now list some of materials used in the fueless generator I never new all this until I became a team member of this project I can say with all sincerity that I enjoyed every bit of this project work thanks and God bless you all.

**INTERVIEW WITH**

In December 2021, Dominique Marshall led an interview with Claire Thompson, IDRC Program Officer, and Luc Mougeot, IDRC Senior Program Specialist for the GDS Research Program at the time of the interview. It focussed on the paths that led to the creation of the GDS Program at IDRC, the ambitions of the agency for the program, and the ways by which current achievements compared with the initial goals. Both Claire and Luc retired shortly after the interview and were replaced by Katie Byrant as the new Program Officer from IDRC. The interview was in the style of an open discussion, or semi-structured interview that followed some high-level topics. Here are some highlights shown as the collective voice of Claire and Luc.

**Early thinking on gender and development**

It goes back about 30 years in IDRC...doing stuff...on women and development and...we were already talking about gender and development...IDRC has a long history of engagement with this issue...we've actually had units called gender and development...

Other times we were trying to mainstream...somewhere in the early 2010s...we were trying to evaluate how we've been doing on gender in terms of this mainstreaming business\* and discovering that we could do better.

Mainstreaming...we borrowed a lot from development NGOs that had been working on gender equality issues, that were gender-aware, gender-responsive, gender-transformative...ensuring that women take leadership positions in the projects that we support...training doing research in particular fields...where women tend to be less present...the issue of [women] quotas is very important in terms of team composition, and particularly attention to the new generation of researchers.

**\*What is gender mainstreaming?**

"The (re)organisation, improvement, development and evaluation of policy processes, so that a gender equality perspective is incorporated in all policies at all levels and at all stages, by the actors normally involved in policy-making." The concept...was first introduced at the 1985 Nairobi World Conference on Women. It was established as a strategy in international gender equality policy through the [Beijing Platform for Action](#), adopted at the 1995 Fourth United Nations World Conference on Women in Beijing, and subsequently adopted as a tool to promote gender equality at all levels.

Source: <https://www.coe.int/en/web/genderequality/what-is-gender-mainstreaming>

**Where it started for Luc...**

"I came to gender analysis through the work in urban agriculture because so much of this is led by women, right from growing seeds, seedlings, cultivating, processing the produce, putting it on the market...through my interest in urban agriculture, I came to discover the importance of gender analysis in our work. I don't have a background in STEM or technology, so this was new to me...at IDRC...we all embarked very enthusiastically into this mission to put gender inequality on the table and work to strengthen the contribution of women to the scientific research results and their applications and I guess this is why I got so excited about the gender design project." - *Luc Mougeot*

**Shift in focus towards gender, innovation and STEM**

IDRC's engagement on gender issues over many years was focused on agriculture and health...then technology, STEM, started to [become significant]...[the] lack of women in these fields was front and centre and clearly needed to be addressed.

When we launched into a new strategy in 2015...we were... trying to do better [with gender issues] and we were trying to do that within the lens of innovation and technology and STEM...It was actually somewhat new to some of us...it was a fascinating time and we spent...a couple of those early years deciding what it is that we want to do with this concept of innovation, technology, STEM and gender...There's a lot of thinking about women scientists and increasing their presence, increasing their role but also trying to change the context in which they're working.

### Learning from others

[We discovered] Gender Insights...international thinktank... [they] had a workshop in September 2017...on gender innovation, implications for sustainable development...we heard about it after the fact and got hold of the report. [Around the same time] we ran into [Londa Schiebinger](#) [gendered innovations] site at Stanford University...then we started to get excited that we're finally finding out what some other people are also doing on this, how does this fit with some of our thinking...What is it that IDRC could bring to that table? It certainly was a detonator in this process. Our connection through Canadian partnerships, with Carleton University.

*"There's a lot of thinking about women scientists and increasing their presence, increasing their role but also trying to change the context in which they're working."*

### From STEM to STEAM

in all of our lit reviews...we were exploring other ideas at the same time, and among those were ideas related to STEAM, so infusing arts, creative arts, liberal arts, etc., into social sciences as well, into understanding STEM and doing STEM...it very quickly went from gender design in STEM to gender design in STEAM, which we were very pleased with.

The STEAM approach, I think that's very interesting...we were looking at other ways of supporting more trans-disciplinary research in technologies and STEM fields and bringing in the arts...

### Approaching Carleton University

We had worked with Carleton, School of Industrial Design, with Bjarki doing a project for us on accessible tricycles in Africa... I remember being fascinated by that. We've never worked in that particular field as such, in the field called design. I remember going to the exhibits that Bjarki put at the end of it and you had people from Global Affairs there... parts of federal government...representatives of embassies and NGOs. It was quite something. So, it certainly made an impression on us...

We approached a number of organisations to see if we could find someone who could manage this for IDRC... it was more than something that we felt that we would be able to manage ourselves, because it would be a

### Where it started for Claire...

"I always had the underlying interest in gender issues... my interest in development came actually from an initial interest in gender issues...I watched all this stuff happen around the gender/women/development...over the years at IDRC...it felt a bit like coming full circle... but in a different context because now it was...STEM technology, which was very new to me...

I had run into the concept of design thinking outside of work and I was absolutely fascinated...my daughter actually went into a programme that is all about design. Social design...I was reading about design challenges... that made me go looking in more detail at work...that's how those two came together...that's why [this project] has such a personal strong feeling...it actually combines both my professional and personal interests in a way that I can't separate." - Claire Thompson

lot of small projects...Normally, we would work with an organisation that's based in the global south, but we were finding it difficult to find an institution to manage something of that scope for all kinds of different challenges...So, we thought we could speak to Carleton and see if they might be interested, [keeping in mind] engagement with southern partners and...decolonising research.

...we cannot do it ourselves, we need a thinking organisation, an organisation that would reflect and monitor and motivate the teams to go beyond simply the sum of the parts. And I think the [GDS] Bulletin and the workshops that you ran speak very clearly to that kind of role that Carleton took on from the very beginning.

...we started that whole back and forth on the proposal itself and we had a number of meetings... able to engage a number of different departments... for example, a Co-PI from History, and we were delighted with that.

This is a pilot, this is unusual, this is different for us as well as for Carleton and does that mean that something somewhere along the line is going to fall apart and so there's always this level of angst, if you will, a little bit but...despite running into various challenges, they were not insurmountable.

*"...infusing arts, creative arts, liberal arts, etc., into social sciences as well, into understanding STEM and doing STEM... it very quickly went from gender design in STEM to gender design in STEAM, which we were very pleased with."*

### Developing the network

We watched you go through the process of choosing your experts...That wasn't always an easy process, finding people willing to be engaged...And then the process of getting the research assistants... IDRC is always looking for the engagement of young researchers in projects because that's just key to the whole future and you were able to do it.

...the fact that you engaged with several departments, and I would say Carleton University is quite impressive in this regard...

### Watching it happen

...through watching recordings of the labs, seeing the researchers and reading the [GDS] bulletins, to witness the excitement that this generated across the board, and then when I read [the DRS paper], I was like, yes, this is what we were looking for to begin with, this deep reflection of how does this work, how do you do this.

### Sustainability

We talked a little bit about the sustainability...if you bring something into an institution and you can embed it deeply from the start, there's much more chance that going forward, after IDRC funds have run out, that the engagement on that issue will maybe continue because people have invested in it themselves from across many faculties or departments in the university.



Luc Mougeot | Luc was previously a Senior Program Specialist in the Education and Science Division at IDRC and one of the driving forces behind the GDS research program. He worked at IDRC for 32 years and founded IDRC's Cities Feeding People program. Luc retired in December 2021.

### Future aspirations - Claire

...it's all about the overall objective of the project...when things or processes... in STEAM...are designed that there is a much greater awareness by those who are doing that it...that they should stop and think and apply a gendered lens as appropriate...The ideal is that this becomes... mainstreamed across all the sectors of places where things are made...I was fascinated by Chiara's course...And since IDRC has a particular interest in the academic world, [the concept of gender]...in any programme...should be taught at a foundational level. That would be one of my dreams.

### Future aspirations - Luc

...let's build a programme around this...it's a very interesting project for regional offices [at IDRC] to know about...I think dissemination within IDRC would be very important to see how the uptake happens and at which level...This was kind of a pilot. Can it work at a higher scale? Could education and science have a call on this now that we've dry run the approach? It will be really interesting to see what the uptake for that is.



Claire Thompson | Claire was previously a Program Officer in the Education and Science Division at IDRC and was the responsible officer for the GDS research program, a program for which, she says, she had a particular "soft spot". Claire worked at IDRC for 32 years before retiring in February 2022.

# GDS PROGRAM REFLECTIONS

We hear from our GDS network on their experiences, reflections, insights and learnings from being part of the GDS Program journey and their hopes for the future.

## Regional Experts

**Raquel Noronha | Latin America**

"Firstly, I would like to thank you so much for the opportunity to be part of the Gender Design in STEAM team. Knowing people and getting closer to a program of this magnitude has made me understand gendered design differently from before. Especially, getting closer to the researchers that I followed from the eight projects in Latin America.

It was important to realize the strength of these women as researchers, in contingency situations, such as the COVID-19 pandemic, in which all research was impacted, without exceptions. Following the solutions, challenges, and impossibilities taught me to be a better, more human, and more adaptable researcher.

Another remarkable issue that I learned a lot about, was the financial management of projects. Despite not being my area of expertise, identifying the financial management problems caused by the absurd bureaucracy of Latin American universities was another turning point in my vision as a researcher, especially in the projects of Brazilian colleagues. This was a huge challenge, in particular to understand the cultural challenges of negotiation and understanding between a university in the global north, such as Carleton, and universities in the global south. We need to carry on a reflection on how to bring different institutional management logic to work together.

Another issue I would like to talk about is the multiple ways of thinking about gendered design. I had a former vision about Gendered Design that became more complex and gained new layers, as I related to you. At LabOne, LabTwo, and at our Latin American group seminars, when we often met just to listen to each other. Each project with its strategies of thoughts and actions, brought these proposals and experiments so that we could overcome even the traditional place of women as participants or informants, and their position as active producers of innovations in their lives.

*"It was important to realize the strength of these women as researchers, in contingency situations, such as the COVID-19 pandemic, in which all research was impacted, without exceptions. Following the solutions, challenges, and impossibilities taught me to be a better, more human, and more adaptable researcher."*



Raquel Noronha | Adjunct Professor and Director of Design and Technology Department at Federal University of Maranhão, and current Head of the Graduate Program in Design. Her key research interests include deep participation, design anthropology, decolonizing design and tacit knowledges.

So, I thank you. I would like to wrap up this speech with a future perspective: together with other colleagues from Brazil, Argentina, Mexico, and Colombia we are constructing a space for discussions, and we are in a very preliminary moment. The Latin American network of gender and design is about giving name and structure to the collective work that we have been engaged in for several years as members of universities in the region and in charge of projects related to design and gender studies.

We are not interested in assuming a Latin American identity, as something fixed and essentialist. We are united by common experiences of working in public state institutions. Institutions that are financed by the taxes of the citizens and therefore with a strong connection to society. Institutions that are not assumed to be outside the territory, because they are the territory. And above all, institutions with a strong commitment to democracy and human rights.

My acknowledgments to IDRC for funding the GDS Program, to Kerry for all the support, Dominique and Bjarki for this opportunity, and Chiara for all ideas shared and thoughts for the future. Thanks to Ona, Maya, and all RA's for all their support, and finally, to the whole GDS team!"

**1** Read the personas on the screen. Pick one and re-read it once.

**2** Use the space below to design an artefact for this persona using the information you remember from the card. Some artefact suggestions are provided below, but feel free to make up your own. You can use tools on Miro or upload a sketch or images to support your design.

**3** Reflect on the persona you chose and your design from Step 1. Make two lists: one that lists your **persona's characteristics**, and another that lists the **artefact's characteristics**.

**3a** Persona Characteristics: List the persona characteristics that informed your design. These can be based on what you remember from the prompt card as well as those you may have made assumptions about.

**3b** Artefact Characteristics: For each persona, write one characteristic of the artefact that was inspired by them.

**4** Choose one of the three gender expression spectrums below. Move it to the box below and make it bigger. Or create your own graphic! Go through both lists you created in step 3. Move the numbered circles beside each item in step 3 to the spectrum below. Place them in the area of the spectrum where you perceive them to belong. Consider these as individual characteristics independent from your design.

**5a** Go back to step 3. In the beige boxes (middle column), apply your reflections from step 4 and write any assumptions you made of the persona's gender expression.

**5b** In the column below, write the expected behavior of the persona based on these assumptions. Consider "You designed the object this way because you expect ..... of the persona."

**6** Use the reflection questions below to help you understand the implications of the assumptions made in the previous steps. Which aspects were overlooked in your design? Add your responses in the bubbles. Participants are encouraged to modify and continue adding to the suggestions provided according to whether or not it applies to their situation. Participants are encouraged to apply the hierarchy as follows: Question > Factors to consider > Assumption > Implication.

**7** How would you re-design the artefact based on your renewed understanding of the persona and on your recent reflections on gender? Re-design your artefact here by changing one characteristic from your initial design.

**8** Place this sticky note on the characteristic you re-designed in step 7. Explain why you chose to change that characteristic. Consider the highly-gendered characteristics embedded in the artefact and how they are perceived by the general population. How does your redesign change their perception? What are the other implications of this change?

**9** How do YOU design?  
**9a** Reflect on your design process. Use the timeline below or create your own diagram to map out and list key steps from your personal design process. Consider the process used in this workshop as well as steps you may apply in other situations and projects for example, research, scenarios, user testing, etc.).  
**9b** Use blue sticky notes to point out where gender throughout your design process (and write where you were aware you were doing it, previously to this activity). Pay attention to where, why, and when this is done and whether this is done consciously or intentionally. Note these reflections on the sticky notes.  
 Reflect on what you understood in steps 3 and 4 regarding how gender plays a role in design.  
 How would change the design process to minimize the effects of your personal biases?  
 Move the orange sticky notes below to the areas in your personal design process (9a) where you could implement meaningful change and add notes that could help you avoid perpetuating harmful stereotypes in your future design work.

**Key Terms & Concepts**

**Sex:** refers to a set of biological attributes in humans and animals. It is primarily associated with physical and physiological features including chromosomes, gene expression, hormone levels and function, and reproductive/sexual anatomy. Definition from the Canadian Institutes of Health Research. <https://www.cihi.ca/en/sex>

**Gender:** refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other how they act and interact, and the distribution of power and resources in society. Gender identity is not confined to a binary (girl/woman, boy/man) nor is it static; it exists along a continuum and can change over time. There is considerable diversity in how individuals and groups understand, experience and express gender through the roles they take on, the expectations placed on them, relations with others and the complex ways that gender is institutionalized in society. Definition from the Canadian Institutes of Health Research. <https://www.cihi.ca/en/gender>

**Gender identity:** One's innermost concept of self as male, female, a blend of both or neither – how individuals perceive themselves and what they call themselves. One's gender identity can be the same or different from their sex assigned at birth. Definition from the Human Rights Campaign. <https://www.hrc.org/resources/trans-identity-terminology-and-definitions>

**Gender expression (gender presentation):** External expression of one's gender identity, usually expressed through behavior, clothing, haircut or voice, and which may or may not conform to socially defined behaviors and characteristics typically associated with being either masculine or feminine. Definition from the Human Rights Campaign. <https://www.hrc.org/resources/trans-identity-terminology-and-definitions>

**Cognitive bias:** Cognitive bias is an umbrella term that refers to the systematic ways in which the context and framing of information influence individuals' judgment and decision-making. There are many kinds of cognitive biases that influence individuals differently, but their common characteristic is that—in step with human individuality—they tend to judgment and decision-making that deviates from rational objectivity. Definition from the Interaction Design Foundation. <https://www.interaction-design.org/fundamentals/cognitive-bias>

**Inclusive design:** design that considers the full range of human diversity with respect to ability, language, culture, gender, age and other forms of human difference. Definition from the Interaction Design Foundation. <https://www.interaction-design.org/fundamentals/inclusive-design>

**User-centered design:** an iterative design process in which designers focus on the users and their needs in each phase of the design process. In UCD, design teams involve users throughout the design process via a variety of research and design techniques, to create highly usable and accessible products for them. Definition from the Interaction Design Foundation. <https://www.interaction-design.org/fundamentals/user-centered-design>

**My gender assumptions**  
*exploring and undoing unaware gender violence by design*

Led by Chiara Del Gaudio, with a undergraduate student from the School of Industrial Design, they started an exploratory research project to design a tool to promote understanding on the relation between design choices and gender. The project, 'My gender assumptions: Exploring and undoing unaware gender violence by design', is generated by the activities and exchanges made possible by the GDS Program. It aims to raise awareness of gender biases among future design students. The tool is based on gender issues inherent in design and when/how they emerge. The process promotes awareness to engage and support designers in rethinking their ways of designing. [The tool is available online](#) and has been applied in several instances in design education at Carleton University.

## Emmanuel Mutungi | Africa



Emmanuel Mutungi | Doctor of Philosophy in Anthropology, Head of the Art and Industrial Design Department, Kyambogo University. A cultural anthropologist, artist, designer thinker, art and cultural administrator. A teacher and researcher interested in indigenous knowledge with emphasis to material culture.

"Three years ago, we started this journey. For me, we are not closing the journey today, but launching a research agenda with different competences brought together. As the African Proverb goes, *'If you want to go fast, go alone, if you want to go far, go together.'* I think we moved as a team, and we have gone very far in terms of contributing to the body of knowledge.

We have gone far in building an effective interdisciplinary network. I can now talk with Raquel from South America, I can compare notes with Chiara, Bjarki and Dominique. I can talk with all the people that have been involved in the GDS program. In other words, it is now possible to put all our competences together to solve societal issues. GDS program was a great opportunity for us and it will continue to be one. This was possible because we chose to move as a team, indeed, we have moved very far.

Similarly, we have developed a broad spectrum for dissemination of our research findings. All the twenty research PIs and Co PIs and teams, host universities, communities where research was conducted, are now part of our network. Our research uptake and impact will never be the same if we keep the network. All the research teams have brought in so many ideas that can be explored for developing more community interventions and solutions.

If it wasn't for Covid-19, our connections would have gone further. Many of our research teams would have been able to get together physically and share their experiences. Despite that, we have gained a lot of knowledge, we have virtually met many people and shared our experiences together especially during GDS activities and video presentations.

We have also achieved interdisciplinary research. It has been a time when the designers, the engineers, the social scientists, have all come together, put our heads together, and we have come up with the results from multiple dimensions. Solutions from the social, the cultural, the engineering, and the design.

What is more fundamental is our indigenous knowledge. That the women in this program in gender design have brought what would have been forgotten practices have been brought back. I have been a student in this process. I learnt from each project, and it encouraged me to know what we can achieve and what we have achieved.

*"It has been a time when the designers, the engineers, the social scientists, have all come together, put our heads together, and we have come up with the results from multiple dimensions."*

I have enjoyed working together with team from Carleton university and I hope you have done the same. I express my gratitude to our PIs Bjarki and Dominique. You have done for us a good job with this program. In a special way, I want to thank Kerry Grace who has been the focal point person, your contribution was so great in this program.

I want to thank IDRC, who funded this initiative that enabled the Carleton team to organize the activities and for the research teams to go into the field to do wonderful research projects.

As I earlier said, we have started a journey of interdisciplinary, intercontinental and multicultural research. The task before us now, is how and where do we go from here and how can we continue working together on this wonderful journey that we started three years ago. We have learnt a lot, but we still have a lot to learn. Let's continue networking with all the participating teams and let us bring our competencies together. I will use this opportunity to appeal for more funding from IDRC such the teams continue with ground breaking interdisciplinary research.

Remember, this is only the beginning.  
Thank you all."

## Yoko Akama | Asia

Transcript of [pre-recorded video message](#) from the closing GDS Program event.

"My name is Yoko Akama. I'm a Japanese woman and design researcher now living on the lands of Boon Wurrung and Woi Wurrung peoples of the eastern Kulin Nation, now called Australia.

As customary to this place, I start by acknowledging the long, continuous line of Elders, Ancestors, and more-than-human Traditional Custodians of this land and pay respects to their wisdoms and what they generously and powerfully teach us about the possibilities of many, shared futures.

I also extend this respect to the Traditional Custodians where you are all gathered, together and differently.

The ongoing violence of colonialism can be witnessed in oppressive structures of gender inequality all around the world, so I'd like to honour the grandmothers, mothers, sisters, aunties, nieces, and daughters everywhere. And their families, friends, communities, and allies that are, and have been, resilient and inspiring in fighting for social justice. I thank you all.

I was also honoured to be invited to this Gendered Design program to help the teams in Asia. From their work and looking through the various contributions from other projects in further regions around the world, there are several points I'd like to summarise as noteworthy.

*"I see these connected and distributed interventions as a 'meta design' - a strategic, systemic, transdisciplinary designing, that shows great promise in what Gendered Design and research is and needs to be."*

Firstly, as a methodological contribution, I wish to recognise the significance of understanding the entrenched and penetrating systemic issues of gender inequality, and how your research powerfully attests sensitivities, openness and relationships that are so central in doing this work.

This is not the same as any generic qualitative user-research. The trust, safety, compassion, and courage you established for dialogue and for intersectional disadvantages and vulnerabilities to be expressed and worked with, is so important. To me, this establishes a benchmark about the ethical premise of what gendered design research is and should be.

Secondly, your projects demonstrated that gendered exclusion and oppression is, indeed, a 'wicked problem'



Yoko Akama | Associate Professor in the School of Design, RMIT University, Melbourne, Australia. Her practice is shaped by various Japanese philosophies of between-ness and mindfulness, to consider how plural futures can be designed together.

that are nested within distributed, dynamic, and contingent factors that condition the experiences of people, groups, and organizations.

You evidence that individuals or technological designs alone cannot 'solve' such massive problems, because we are all entangled in historical, socio-cultural construction of gender inequities.

So, while it might seem frustrating to be scratching the surface and alleviating just the symptoms in a short-term project, our collective learning here enables us to view these explorations more holistically.

From my point of view, it's the combination of all your work as orchestrated, connected, layered, and distributed, variously intervening at differing points at the individual level, family level, community level, organisational level, sector level, policy level, disciplinary level, through dialogue, education, research. This is what matters and is most compelling.

I see these connected and distributed interventions as a 'meta design' - a strategic, systemic, transdisciplinary designing, that shows great promise in what Gendered Design and research is and needs to be.

Working with and through this distance has been a challenge in my participation in this program but I hope my small contribution goes some way towards recognizing the achievements. Congratulations to the project teams, Sector Experts, Advisors, affiliated researchers, and the Carleton team! Well done!"

## Sector Experts | Carleton University

**Adam Weiss** | Assistant Professor, Transportation Engineering, Civil and Environmental Engineering, Sector Expert projects ID17 and ID74

*Extracts from an interview conducted by Dominique Marshall with Adam Weiss on 27 July 2022.*

### Transportation

"I think that the type of work that I do in transportation engineering is generally quite interdisciplinary. We tend to collaborate a lot with people on geography, in urban planning.

With the project in Turkey...they were looking at really making sure that a particular aspect of the transportation system... was designed in a way that was going to improve safety... safety analysis and feeling safe, that's something that we're very aware of is going to improve peoples' livelihood or increase peoples' livelihood of travelling by that particular mode or making that particular choice.

For the Rwanda project...They were looking at how gender influences travel behaviour and travel choice in Kigali City... that's much...in line with the type of work that I do. It's looking at travel behaviour, differences in mobility patterns, these sorts of things. And so, typically, when we're estimating a model of travel behaviour, what we'll include is a variable for the gender of the person that's making travel.

### Benefits for all

Generally, what we see is that, assuming the individual is living in a household that has traditional gender roles, the woman is actually more likely to take transit. And that creates, potentially, problems.

...issues around equity and mobility justice are really very much emerging and becoming more and more important in the research world...And so, improving safety on transportation benefits everybody. It's not just that it's benefiting women... looking at how are we going to improve the quality of the transportation service and the transportation system. And so, ... looking at it from a big, macro level lens, there are improvements that you can make at the macro level. And there are improvements you can make at the micro level. So the fact that [the projects are] looking at the micro level, trying to improve that very specific aspect of the transportation system, that's great...it doesn't just benefit the target in this case, which is women. But it benefits everybody, because a safer transportation system is going to be more attractive to everyone.

Ultimately, when you look at the transportation system, it's a big integrated part of the larger urban system. And changes to the urban system are often done through a political lens. So if you want to make a change to the transportation system, there's going to be politics involved. And so, having an understanding of how the decision makers work within that context is something that's really important to understand.

*"...issues around equity and mobility justice are really very much emerging and becoming more and more important in the research world"*

### Designing surveys and models

There are aspects of the actual survey building that have a little bit more of a design component to it. Where we're trying to optimise how we ask questions, to minimise respondent fatigue, so that we get a higher response rate... in that sense, yes, I suppose there's a design aspect within the actual surveys...There's also a design aspect in actually picking which model structure you want to use, and building the model up from that, and picking which variables to include...very different from the actual industrial design work on going into a bus, or a bus stop, or what have you, and figuring out well, what can we add or change or improve to make this more safe?

### Future collaborations and opportunities

What appealed to me initially, when I was brought into the project, was the potential for future collaboration...I'd be very interested in working with [the projects] on future travel surveys or travel studies, future analysis of the data that they've collected...I think that would be excellent."



Adam Weiss | Research focus on travel demand modelling and understanding behavioural changes in response to autonomous vehicles.

**Adrian Chan** | Professor, Systems and Computer Engineering, Director, Research and Education in Accessibility, Design, and Innovation (READi), Sector Expert projects ID91 and IDA

*Extracts from an interview conducted by Dominique Marshall with Adrian Chan on 1 September 2022.*

### Interest in the GDS Program

"My expertise and my area of domain is in engineering, specifically biomedical engineering. As part of my work, I do a lot in accessibility. I would consider myself an ally and active in the area of equity, diversity and inclusion, which also includes women in engineering, and advocating for a more inclusive society for people with disabilities. This includes making research, both in terms of who participates in research and the research itself, more inclusive and equitable as well. This whole [GDS] project fits along with that.

When we think about design, whether it be from an engineering perspective or not, it has traditionally been male-focused and even focused perhaps on more cis-gendered, white males, I suppose. And [it] excludes a number of individuals, including females, including people with disabilities.

This project...looked at design from a gendered lens. It also focused on the Global South, which has also been historically excluded in many ways as well and under-resourced. It aligns a lot with my own interests there.

### Problem-solving and impact

I've always had an attraction to engineering because...it's a very problem-solving focused discipline. When people describe engineering, they often describe it as using scientific principles to solve problems. But the part that is often missed is 'for the benefit of society'. And that's the part that resonates with me...I want to do things that are impactful.

...it's not just about what we produce, but the process by which we produce it. Who is involved with that process and how they're involved as well is also an important part.

When you think about accessibility, barriers are human designed. We design things that result in barriers, and we can design things that are more accessible as well. But we need to ensure that our education includes that aspect of it...ensuring that students...get exposed to this so they learn about accessible and inclusive design.

[The projects'] approaches are very similar to what we do... And they're extraordinarily resourceful to get some impressive



Adrian Chan | Research focus on biomedical engineering with expertise in biomedical signal processing, biomedical image processing, and non-invasive sensor systems.

work done...they are taking many similar approaches, like human-centred design approaches in solving very practical and impactful problems that are there.

### Resilient and adaptive during the pandemic

...it was just impressive how [the projects] remain flexible and adaptive...showing extraordinary resilience...I learnt a lot from that as well where things are never easy. I had this plan and I want to reach this destination, but given the circumstances, things have to change. And just hearing how they've adapted to things and remained resilient got me personally to think about how I was adapting over these past couple of years.

*"When people describe engineering, they often describe it as using scientific principles to solve problems. But the part that is often missed is 'for the benefit of society' ...it's not just about what we produce, but the process by which we produce it."*

### Community

I think the fundamental part is the researchers themselves...the work that's been done, it's a community that they've already been involved with, been working with. And then this is an opportunity to continue that work and expand upon it.

...the other part that was important, is to have that trusting relationship...You're not promising that you're going to solve everything. You're promising that you're going to spend the time and effort to try...Sometimes you'll have wins and sometimes you'll just have learnings without a solution.

**Design as a reciprocal relationship**

Trying to have an understanding of the context and the problems, and then providing solutions that serve the end-user, rather than thinking about what as a designer we want to do... the experiences of the participants. Did they feel like they were part of the design?...human-centred design is like a spectrum...You can do everything, from consultations where you're just talking to people, to co-creation where they're actively participating in it. When we think about design and research...we're not just serving the participants, but we're also learning from them. It is a reciprocal relationship.

**Future collaborations**

We're taking people that didn't know each other and getting them to interact. And when you put large groups of people together, there can be new relationships and opportunities that get exposed...how do we facilitate that type of work, especially when we're talking about things that are cross-cultural?...Just like interdisciplinary, transdisciplinary work, when you put people from disparate places together, interesting things happen because they're looking at things from a different perspective. If there are places where you can see...cross-cultural links...there's interest to explore... maybe some of the projects have some overlap that could benefit each other."



**Burak Gunay** | Professor, Civil and Environmental Engineering, Building Performance Research Centre (BPRC), Sector Expert projects ID40, ID73 and ID88

*Extracts from an interview conducted by Dominique Marshall with Burak Gunay on 1 September 2022.*

**Community and impact**

"...when I started my job, my focus was mainly on commercial buildings. It still is. Improving their environmental impact, improving their energy performance. But then...I realise that there's a bigger problem about housing and the building sector in general...The way we structure research through partnerships with for-profit companies blindsided me from the fact that there are community housing programmes... how do I make sure that various underrepresented groups are adequately represented in building codes? Because building codes are developed with very standard household archetypes or prototypes in mind, and that clearly excludes people suffering energy poverty, people with various discriminations along the process...I thought this

[GDS] project could be an opportunity for me to expand my knowledge broader...it says gender design, but I think it's broader. It includes various aspects of EDI [equality, diversity and inclusion].

The focal point is community housing and how do we ensure that the sections of the population that is typically disregarded in building codes [are included].

*"I thought this [GDS] project could be an opportunity for me to expand my knowledge broader...it says gender design, but I think it's broader. It includes various aspects of EDI [equality, diversity and inclusion]."*

**Climate change**

Climate change and extreme weather events triggered by climate change:...If you're living in a poorly constructed home, poorly maintained home, and if you end up suffering a power loss, your home's temperatures will drop rapidly to dangerous temperatures...If you probe them [the figures from extreme heat event in British Columbia], you release that most people who died during that extreme weather event are from black communities and marginalised communities in that region...you don't have to go to such extremes. If you are living in a very uncomfortable home constantly, that will translate into your ability to be productive and to be living in a healthy environment, raising your kids in a healthy environment

**Interdisciplinarity**

Building engineering: It's basically energy efficiency, indoor air quality and building performance in general. Broadly speaking, our field is quite interdisciplinary by nature. Unfortunately, when I say interdisciplinary in engineering, that means that you work with other engineers. It's mostly architects...There are lots of overlaps between human health related aspects...It's a fairly open field for interdisciplinary research."



**Burak Gunay** | Research interests include adaptive indoor climate control in buildings; automated fault detection and diagnostics in buildings; data-driven modelling in building science; building performance simulation; and big data for intelligent buildings.

**Fred Afagh** | Professor, Mechanical and Aerospace Engineering, Sector Expert projects ID65 and ID71

*Extracts from an interview conducted by Dominique Marshall with Fred Afagh on 25 July 2022.*

**New challenge**

"If I have to characterise this experience, I would call it a challenging experience, and that's in a positive sense rather than a negative sense. Challenging in the sense that it's a really new area of research...one thing we realised immediately is that this 'gendered design' is something that we didn't know what it was...We knew there was something like that but we didn't know what were its implications, what were the dimensions, what were the challenges..."

It's very simple to say that in the design thinking we are trying to implement the gender aspects of the design...That is a very nice definition or description, but specifically, what are those considerations, those are the ones that have been the challenge. It's been quite a positive experience. I enjoyed reading the final reports.

**Social sciences and engineering**

Some of my colleagues might not agree with this comment, because they will say that everything as an engineer we do or design is for humans and for the progress of civilisation. I see that, but I am not sure how much we have been able to consider in our engineering profession when it comes to things like sociology, psychology of the user, gender of the user, race of the user.

These sorts of considerations, I should probably put them under the general title of social sciences...the marriage or the intersection of the social sciences with the engineering. This is something which I think has been missed and [the GDS Program] is very timely.

*"...one thing we realised immediately is that this 'gendered design' is something that we didn't know what it was...We knew there was something like that but we didn't know what were its implications, what were the dimensions, what were the challenges..."*

One of the things I learnt from this project is that this concept of a gendered design has to be implemented into our engineering curricula in the undergraduate school from the first day. It is for somebody like me who is from the old school... this idea of gendered design was never really there...this is



**Fred Afagh** | Expertise and research interests includes: aero-structures, applied dynamics, dynamics and control, vibrations, structural dynamics, smart structures, stability theory, elastic stability

the time to bring in these aspects of social sciences more into our engineering undergraduate programmes so that our graduates will be trained with this sort of understanding and with this point of view.

**Engineering profession**

In engineering...one of the challenges we've been having... for quite a number of years...is the participation of females, of women, in the profession itself. One of the biggest challenges...is to attract more girls and more women to this field and to really do away with this idea that this is a tough guy's work. Engineering is not a tough guy's profession.

If you want to implement the gendered design in the engineering curriculum, one of the things which should go along with this I think is at the same time trying to make sure that we've got more female engineering students in our classes.

**Impact of funding**

[The projects] from Nigeria, mentioned...how this IDRC project has given them a chance to establish connections with various trades and organisations in this area and in the general area of collaboration with these people when it comes to design, that they will be using this in the future. And they say very clearly that had they not received this funding, they would have never had that chance.

**Community**

This was one of the strongest aspects of both projects...I think both of them did a tremendous job in this regard, reaching out to the community at large, interviewing them, and asking some very interesting questions."

**Jill Wigle** | Associate Professor, Geography and Environmental Studies, Sector Expert projects ID61 and ID80

*Extracts from an interview conducted by Dominique Marshall with Jill Wigle on 11 August 2022.*

**Care in the community**

"I've learned a lot from [the projects] in how they've adjusted the project and some of the concepts they're using. Or how they're using those concepts in focusing around developing a community kitchen, really, as a hub...There is so much interesting work going on in Latin America, in particular, right now, around thinking about community of care, care policies, and care and social reproduction at the neighbourhood level.

**Notions of "Socio-territory" and autonomy in Latin America**

The way people make urban habitat and housing in Latin America it's very difficult to understand those processes and how they're conceptualised by residents without understanding autonomy and territory as well as the context in which these processes are taking place... socio-territory... people coming together in a collective way to make housing and habitat through collective processes. Sometimes with State support and often without State support. So, these are always seen as socio-territorial struggles.

Territory: a certain idea of if you produce space through social processes then you have the right to shape those spaces...Latin America has contributed so much, both activists and researchers, to this idea of having the right to the city...if you produce housing, if you make the sidewalks, if you make the public spaces, then you have a right to those spaces. And they are considered community spaces, not even generic public spaces...[if] the State intervenes in those spaces, they have to be careful because it's a different understanding of the space itself. And that's where autonomy is often connected to territory...this is what I have learned from Latin American researchers...

**(Trans)gender**

One observation I would make is that gender has to be thought of in terms of transgender and how that translates into some of these projects I'm not sure...certainly, something that's on the horizon...how do you adjust gendered policies now to incorporate transgender...not thinking about gender as a binary.



Jill Wigle | Primary research interests include informal housing and settlement processes, urban spatial regulation, and sociospatial conflict in Latin America, especially Mexico City.

**Lived experiences**

People want to be able to set the agenda from their own barrio because they are the experts on their spaces and what they need...this is, ultimately, about listening to what women's lived experience is and trying to adjust policies to address those lived experiences.

Women are often not only and not exclusively caring for elders, caring for children, working, engaged in community projects...systems of the city are not always designed around that, so we see some retrofitting of that...hubs are important... taking women's everyday lived experience and dealing with their social and spacial complexities of everyday lives.

*"Latin America has contributed so much, both activists and researchers, to this idea of having the right to the city...if you produce housing, if you make the sidewalks, if you make the public spaces, then you have a right to those spaces."*

**Knowledge exchange**

...we're talking about gender design through very participatory, interdisciplinary methods, moving from STEM to STEAM...Wouldn't it be great to pull all these folks together, in person, so that they could meet each other and exchange knowledge and learning...to create an ongoing network...to support and exchange and be in touch with whatever happens next from these projects."

**Katie Bonier** | Associate Professor, Architecture and Urbanism, co-director of the Carleton Urban Research Lab, Global Water Institute, Sector Expert projects ID37 and ID41

*Extracts from an interview conducted by Dominique Marshall with Katie Bonier on 4 August 2022.*

**A for Arts**

"...the idea that there would be an 'A', that the arts and history and prototyping and design would be from the start at the core and acknowledged as relevant not only in the practice of Gendered Innovation but also in the analysis and reporting of it seemed to me just tremendously exciting.

**Students**

... the structure of it that was fantastic in terms of learning new research methods and actually bringing these younger folks, graduate students into roles in which they were learning and supporting and probably changing the shape of their research going forward. So, that was fantastic.

**Environment and health**

I did a PhD on architecture. A PhD in architecture is a diploma... I'm on the theorising side and the historian side... And my work has to do with cities in relationship to changing ideas of bodily health and changing ideas of environment... the sorts of interventions that are made infrastructurally of the larger built environment and how these shifting ideas about bodies and about environment have historically...influenced what we see as a solution-based thinking in response to crisis in cities based on usually a somewhat limited and always changing idea of how bodies and environment work.

*"that the arts and history and prototyping and design would be...at the core and acknowledged as relevant not only in the practice of Gendered Innovation but also in the analysis and reporting of it seemed to me just tremendously exciting."*

**Gender roles and water**

...the unavoidability of gender at the core of all of the things that are in my work...I have only addressed when teaching mostly some of the issues of gender roles around things like water gathering and the shift of patterns of communication, of socialising, of motion outside and beyond the house with the shift from gathering water at a fountain or from a river to pipes bringing water into a house.

And so that's a core moment that has to do with gender and radical transformation of cities and urban life.

**Gendered design working group**

I would love to have a Carleton Gendered Design group... More conversations between the STEMS and the STEAMS which I think is lacking at Carleton...The idea of having a voluntary working group for folks to float different small pieces of work where you can just bring a couple of pages or an abstract or something like that to talk about issues of gender in a question that you're considering, in a piece of writing or research...That helps you with the thinking part where it's not at the point of publication...where you really get other people's minds, eyes and voice to help with something... you could have occasional, more formal presentations...that would be fantastic...I feel like having a writing and research group that was also STEAM...would be really pretty magical and exciting..."



Katie Bonier | Her research spans from historical analysis to futuristic visions, and centers on the shaping of the built environment around water, technology, and ideas of health and balance.

**Tracey Lauriault** | Associate Professor, Critical Media and Big Data, Journalism and Communication, Sector Expert projects ID38 and ID50

*Extracts from an interview conducted by Dominique Marshall with Tracey Lauriault on 21 July 2022.*

**Philosophy of technology**

"Very important to have that transdisciplinary lens...from the lens that I brought, it was more a philosophy of technology...critical thinking about technology...and conceptualisation of how data might be produced and used within a project...since [the start of the project], a book has come out, that is fantastic, called *Data Feminism* by D'Ignazio and Company...it has a fantastic framework on how to assess whether or not what you write, or the projects that you're working on, have a feminist type of perspective.

*"...one of the things that's underestimated in all of these projects is the cultural predispositions of disciplines, and the friction that occurs from a lack of listening and also acknowledging clear cultural disciplinary differences."*

**Predispositions**

I've been involved in a couple of things...One is Open Smart Cities...another digital twin project with architecture... an AI Project with archives around the world...and now I'm in the process of co-drafting a research proposal that's coming out of engineering...one of the things that's underestimated in all of these projects is the cultural predispositions of disciplines, and the friction that occurs from a lack of listening and also acknowledging clear cultural disciplinary differences.

**Transdisciplinary**

Because transdisciplinary research, it's one thing to say different disciplines are involved. It's a whole other thing to actually understand each other, work with each other, integrate each other's work, and mutually benefit and create a new outcome as a result of that collaboration, in a very clear way, where everybody understands it.

**Open access**

One of the things I did discover that was really important... was that people in the south don't have the same libraries we have, which means they don't have the same access to journals in the way that we have...They don't have the same access to knowledge institutions in the same way...Carleton University has a really amazing library, with really amazing

access to resources...people in the south, they don't have access to those materials, and I think that that's a huge shame...So, the whole issue of open access, open archives, access to libraries, open data, those kinds of things, really have to show up in the south.

**Archiving GDS**

First, the future needs to rely on the past...How are the data proposals, results, reports, lists of people, meeting minutes and agendas? How's all of that being archived? The preservation of those things is really important, so that people can access it...How could we create and foster more collaboration between projects, in different regions, at some point in time in their trajectory, and also encourage that reflection on all sides of the equation."



Tracey Lauriault | Research focus is part of a new field entitled critical data studies, and her areas of interest are data, infrastructures and geographical imaginations, spatial data infrastructures, open data and the preservation and access to research and geomatics data and Big Data.



These interviews were conducted by one of the PIs Dominique Marshall following interview techniques and practices from oral history.

Other Carleton University Sector Experts who have been part of the GDS Program network include:

**Mika Westerlund** | Associate Professor, Entrepreneurship, Sector Expert projects ID33 & ID79

**Ozayr Saloojee** | Associate Professor, Architecture and Urbanism, Sector Expert projects ID37 & ID41

**Vivian Nguyen** | Assistant Professor, Institute of Environmental and Interdisciplinary Science, Sector Expert projects ID47 & ID57

**International Development Research Centre (IDRC)** | Katie Bryant

**A Southern network designed: embedding gender and the arts in STEM and design for inclusive development**

This project was born out of a vision from two of my predecessors at the International Development Research Centre (IDRC) – Dr Luc Mougeot and Ms Claire Thompson – who made significant contributions throughout their extensive careers at Canada's IDRC to support research in the global South that could foster sustainable development and inclusive innovation. In the case of this specific project, they saw the importance of embedding the creative arts and humanities in research IDRC was supporting to make science and innovation systems more inclusive in the global South. Such an effort seemed overdue as current knowledge platforms on gendered innovations still largely drew on experiences from the global North. To begin to redress this issue and promote this vision both within the IDRC and the larger field of research for development, they approached Carleton University to facilitate a small grants programme that would begin to put this concept into motion.

As was well showcased in the closing event of the Gendered Design in STEAM in LMICs in early October 2022, findings from various projects supported via this initiative illustrated how women and members of marginalized groups can be put front and centre of science and innovation systems in the global South. Not only did the researchers involved in these projects examine how to make society more inclusive through their proto-type designs and case studies, they also clearly demonstrated how science and innovation systems can be more inclusive by using different methodological approaches, particularly by incorporating a gendered lens into design research and praxis.

Over the course of the past three years, and despite the significant challenges posed by the COVID-19 pandemic, this project team increased the number of women researchers and designers in the global South, as well as in Canada by building the research capacity of many graduate students at Carleton University. In addition, they also changed how we think about research and how it can be done in the discipline of design. This is particularly important in working toward inclusive science and innovation systems, because we need to both increase the number of women researchers in these systems – and develop new methods, theories, and



Katie Bryant is program officer with the Education and Science Division at Canada's International Development Research Centre (IDRC). She supports various Southern partners working to ensure science and innovations systems in the global South are more diverse, equitable, and inclusive. Prior to joining IDRC, she spent more than 15 years working in the field of higher education studies at universities in Canada, Botswana, and South Africa. Her praxis and research work focused on helping universities implement evidence informed teaching methods and capacity building initiatives to ensure the access and success of students and early career researchers from diverse backgrounds.

approaches that can uncover and address systemic and systematic biases that maintain and perpetuate gendered inequities in society.

The intense energy and determination to continue this work was palpable from the screens of all the researchers who participated in this closing project event. Although many had never met in person, one could see and feel that a strong network of gendered in design researchers had been woven through the incredible work of Carleton and all members of the individual teams in various Southern countries. As the projects close for this phase, I look forward to reading and hearing more about the learnings across the projects to further this newly emerging discipline of gendered design – a clear illustration of how we can make design thinking and praxis more inclusive and continue to move toward building more inclusive innovation and science systems in countries of both the global South and the global North.





## Research Assistant Coordinators and Research Assistants | Carleton University

### Amie Wright | Research Assistant Coordinator

"It was a great honour to be a part of GDS this past year supporting the program with digital archiving and sustainability initiatives primarily through the creation of the GDS website. As a public historian, working to ensure that the insightful findings of the twenty projects will be findable and accessible for both academic researchers and community investigators for the future is paramount to knowledge mobilization and a key part of digital sustainability.

Additionally, I learnt so much from the projects and the project teams. I was so inspired by the ingenuity, tenacity, creativity, and care all teams showed working through challenging conditions including a global pandemic."



Amie Wright | PhD Candidate in Public History at Carleton University (Ottawa, ON). Her research interests include the teaching of history, visual and popular culture, censorship, digital humanities, critical librarianship, and archival theory. Amie has a MLIS in Library Studies from Western University (London, ON) and previously worked as the manager of school outreach at the New York Public Library.

### Maya Chopra | Research Assistant Coordinator



Maya Chopra | MDes graduate in Design from the School of Industrial Design at Carleton University. Research focus on intersectional feminism, power, and design processes.

"I was fortunate to join the GDS program in March 2020. The program propelled me into a new-found understanding of design and sparked my interest in pursuing research around the relationship between gender, design, and power. Additionally, learning from each project team particularly influenced my thinking within my thesis research as I was inspired to focus on intersectional feminism and the importance of uplifting a plurality of local knowledge.

It has been a pleasure to work alongside an international team of researchers from various disciplines. I have enjoyed engaging in constant discussions on what gendered design means across contexts and am grateful for the many meaningful relationships formed along the way."

**Research Assistant Coordinators** - supporting the RAs through various activities and supporting the Program Coordinator on individual areas for the GDS Program:

**Amie Wright** | Fall 2021 to Fall 2022  
Asia, GDS website, library and archiving the GDS Program

**Maya Chopra** | Fall 2020 to Fall 2022  
Africa, GDS Program design creation and support

**Ona Bantjes-Rafols** | Fall 2020 to Fall 2022  
Latin America, oral history interviews, Spanish translations and interactive map

**Najeeba Ahmed** | Winter 2020 to Winter 2021  
Africa, GDS Program design support

### Ona Bantjes-Rafols | Research Assistant Coordinator

"Joining the project in September 2020 was intimidating at first, as a historian unfamiliar with the design field. However, the more I saw, the more I realized the parallels between the concerns being discussed in the historical discipline and in design. Involving communities in the research process, valuing local knowledge, and keeping social impacts in mind were all essential parts of my education in oral history methodologies. We might use different terms and references, like 'sharing authority' rather than participatory design, but it became clear that we are concerned with similar issues. Being able to share my favourite literature on qualitative methods in the history discipline was exciting and proved how valuable it can be to draw from multiple disciplines.

I really enjoyed the meetings Raquel Noronha, the Regional Expert for Latin America, organized - I learned so much from all the researchers, and experiencing multi-lingual meetings of Spanish and Portuguese was a fun bonus. Getting to interview researchers from Mexico, Colombia, and Argentina was also a wonderful opportunity to get to know better the researchers and contexts behind these amazing projects, how they adapted to the challenges of COVID-19 and their reflections on what gendered design means."



Ona Bantjes-Rafols | MA graduate in History with a specialization in Digital Humanities. Research focus in oral history, queer geographies, and 1970s Barcelona.

### Fernanda Fontes | Research Assistant

"The GDS program was a unique experience which broadened my perspective on what design can be and do. First of all, because it put me in contact with the work of experienced researchers, inspiring me on the possibilities, challenges and insights, which supported me in thinking and designing my own research. Moreover, the GDS program helped me reflect on the direction of my career path and how I intend to contribute to society as a designer.

Secondly, the interdisciplinary and multicultural approach of the projects provided a deeper perspective of the different issues women face in society and the creative participatory methods that can be implemented when working with the people directly affected by what we are designing.

Finally, as a woman, the GDS program made me aware of my responsibility to design for the inclusion and support of less privileged women to have a more equitable society.

I am proud to be part of the ongoing impact that the GDS program will have, and I am very grateful for everything I have learned and for all the people I have met."



Fernanda Fontes | MA graduate of Design. Her research focuses on design applied to children's learning with a specialism in iterative methods for problem-solving in education settings. Her interests revolve around design thinking, gender design, design for social innovation and universal design.

**Kavita Mistry** | Research Assistant

"Working with the various projects of the Gendered Design in STEAM (GDS) program at Carleton University was such a privilege. It allowed me to work with diverse projects that are creating major shifts in the daily lives of all humans around the world and learn different and innovative ways researchers are bringing-forth change. Not only was I able to learn different research and technological innovations, but these projects were incredibly educational, and encouraged me to learn more about different systems in different countries, how they work and who they benefit.

Today, gender studies is such an important topic and it is exciting to see how each country is embracing gendered design. I really enjoyed the collaborative aspect of this program, within the teams, across borders, and amongst projects. Overall, it was such a pleasure to work with the GDS program, helping researchers around the world promote their life changing innovations, and learning more and more about the diverse cultures and systems of the world."



Kavita Mistry | PhD student in the Public History program, specializing in Curatorial Studies. Her research focuses on defining ethical approaches to using 3D digital and 3D printing technology for cultural heritage materials and monuments.

**Victoria Asi** | Research Assistant



Victoria Asi | MSc student of the Sustainable Energy Engineering and Public Policy department. Victoria's thesis work is focused on the acoustic evaluation of small wind turbines. The research involves commissioning of the wind tunnel, wind tunnel testing and measurements of noise emission from wind turbines.

"Being a Research Assistant on the GDS Program was enlightening. It was a hands-on experience, learning tools that aided the success of the Program such as video editing, the use of Miro boards and accomplishing various tasks as requested by the team. It is beautiful to see how each project ID, began with just a proposal and then overtime, in about two years we see the projects come to live. Supporting each Project ID was the crux of the program for me and being fully involved through the course of the program duration was fulfilling. I am thankful to my sector expert, Fred Afagh for believing in me and giving me the opportunity to work on both projects. I am also thankful to Kerry Grace, Maya and Ona for their support through the course of the program."

Over the course of the GDS Program we have had Carleton University graduate students supporting the Programs activities and projects:

- Alicia Gal** | Summer 2020 - Summer 2022  
Projects ID91 and IDA
- Andrea McIntosh** | Fall 2021 - Winter 2022  
Projects ID37 and ID41
- Andrew Howarth** | Summer 2020 - Fall 2021  
Projects ID47 and ID57
- Carla Ayukawa** | Fall 2019 - Winter 2020  
Projects ID38 and ID50
- Dina Al Rububaye** | Fall 2021 - Winter 2022  
Projects ID 17 and ID74
- Fernanda Fontes** | Summer 2022  
Project ID53, poster design work, translation assistance
- Fiki Falola** | Summer 2020 - Winter 2021  
Project ID41
- Jessika Guay** | Summer 2022 - Fall 2022  
Projects ID47 and ID57
- Katherine Barrett** | Summer 2022 - Fall 2022  
Projects ID73 and ID88, plus ID17
- Kavita Mistry** | Summer 2022 - Fall 2022  
Projects ID33, and ID79, plus ID74

- Lucia Vargas** | Summer 2020 - Fall 2020  
Projects ID17, ID74 and ID80
- Madiha Rehman** | Summer 2020 - Winter 2021  
Projects ID33 and ID79
- Maya Chopra** | Fall 2022 - Fall 2022  
Projects ID40
- Ona Bantjes-Rafols** | Winter 2021 - Fall 2022  
Projects ID61 and ID80
- Rezwana Afrose** | Winter 2021 - Summer 2022  
Projects ID38 and ID50
- Victoria Asi** | Summer 2020 - Fall 2022  
Projects ID65 and ID71
- Yagmur Babaoglu** | Summer 2020 - Winter 2021  
Projects ID40, ID73 and ID88

The GDS Program hired three students to assist with the production of videos and posters for three projects in the fall 2022:

- Benjamin Koskowich** - ID41
- Deanna Bogaski** - ID37
- Sarah Chin** - ID38

The GDS project videos and graphics for the GDS website were designed by **David Cabrera Zapata**.



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