Gendered Design in STEAM Bulletin

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- <u>Wit López on Radical Softness and Tactile Disruptions</u> | April 1, 2021 - 13:00 to 14:00 (EST)
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- <u>"Design Justice" with Sasha Costanza-Chock</u> | May 5, 2021 - 12:00 to 13:00 (CT)
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Chiara Del Gaudio talks about Participatory Design

With this text, I am providing a brief overview of Participatory Design (PD) as emerged in Scandinavia in the 1970s, and of some of its principles. I would like to stress that this is far from being an exhaustive work on PD. I am only providing information on PD that can act as a starting point of discovery for those approaching it for the first time. For an in-depth dive into this approach, researchers might want to read the 'Routledge International Handbook of Participatory Design' (Simonsen & Robertson, 2013a), the proceedings of the Participatory Design Conference (PDC), and the additional reading suggestions provided on the same website. I also strongly suggest engaging in conversations with PD researchers and practitioners. They can provide insights into the situated nature of PD practices, their potential, their challenges, and on how to approach them. PD is a powerful approach when we think about more gender inclusive design processes and outcomes. It allows us to co-construct a multifaceted understanding of a specific situation and how to address it through a process that promotes societal dialogue, and potentially relational change, between the various social actors. Finally, this is not a literature review; principles and definitions were chosen based on my own understanding and view of PD.

Chiara Del Gaudio,
Assistant Professor, School of Industrial Design
GDS Program Investigator

Participatory design (PD) practices can be found under different names, in different historical periods and geographic areas. They are not a discovery of the academic field or of the "Western world". However, the one better known within the design academic field emerged in Europe, specifically in Scandinavia, in the 1970s as a workplace democracy movement.

Several phenomena can be traced down to its origins, among others: the political and social movements that characterized Western society in the 1960s and 1970s; the concepts of deliberative democracy and participatory democracy; and the Action Research and Participatory Action Research approaches. The latter affirmed the need for a stronger societal contribution of academic knowledge and for researchers to build knowledge together with local communities.

Within this framework, PD, as formulated in Scandinavia, was a direct response to the changes that workplaces were going through due to the introduction of automated technologies (Simonsen & Robertson, 2013a). Design researchers, committed to democratic values, reflected on how changes in the work environment would have affected workers' lives and decided it was not enough to make the new systems usable, efficient, or legible. The core principles of user-centred design, while valuable, were considered problematic as they paid limited attention to changes in workers' lives, gave no voice to them, and gave little significance to collaborative work. Therefore, those designers started exploring ways to give voice and power over their life back to the users (Simonsen & Robertson, 2013a).

Over the four to five decades that passed since its emergence, PD has inevitably evolved and transformed, as well as being embraced by practitioners from different fields, and geographical areas - each one of them expanding and challenging our understanding of what participation means and what it means to practice PD processes. Therefore, the PD community is a heterogeneous cohort of researchers and practitioners from multiple fields interested in "user's" participation in the design process. It includes, but is not limited to, researchers and practitioners from HCI (Human-Computer Interaction), CSCW (Computer Supported Cooperative Work), co-design, design research, CSCL (Computer Supported Collaborative Learning), ICT4D (Information and Communication Technology for Development), design anthropology, design psychology, design industry, architecture, and the Arts.

Furthermore, as you might have already noticed, the interest in co-design processes (that is, design processes shared between different people), has been growing widely throughout society in the last two decades - creative society, creative class, design thinking. This has resulted in a greater adoption of design processes that include user's contribution by companies and designers. The motivations underlying this growing interest and application are diverse, from sociotechnical phenomena (i.e. networks society) and ideological motivations, to pragmatic motivations. However, these proceses are not always aligned with the core principles of PD. This is probably the first main understanding that someone can achieve about PD: not all the practices that directly involve users in the design of artefacts, processes and environments that shape their lives, can be defined as PD ones.

So, which ones are? You might ask.

I would say that PD is foremost a design approach that recognizes that design processes are political processes, the implications of designers' choices, and that it embraces this understanding in the effort of subverting existing power balance and orders through the design process itself. As you can find in the above-mentioned sources, since its origins, it has aimed at giving voice to those who are usually excluded by decision-making processes, and at promoting ones that are more democratic.

It recognizes the value generated by the encounter and articulation of different perspectives for the emergence of matters of concern (Binder et al., 2011) - and for the very constitution of the world (or better, worlds) we live in.

Within the design field and design process, PD has brought forward the understanding that the user is not only a repository of data for design research, or a means for testing the efficiency of design outcomes. Users have a unique first-hand knowledge of and expertise on the situation, and their contribution in interpreting and building on this knowledge is crucial in the design process. According to PD, design knowledge cannot emerge from the aseptic combination and use of data, but from a process of collective knowledge sharing, exchange, and reflection. Information should always be contextualized, and knowledge is co-constructed and lived. The understanding and focus on the specific situation addressed is necessary in promoting social changes.

PD has worked towards deconstructing the elitist qualities of any design process: everybody is creative and can participate in a design process if the appropriate means for participation are provided, and it is the designer's task to provide them. The distinction between designer and user breaks down in PD, which is characterized by a more dynamic interaction and interplay among the participants of a process. All this, within PD, has reinforced the understanding of design as a process, and not only as an outcome, and the recognition of the situated nature of the design practice and of participation.

The Routledge International Handbook of Participatory Design, defines PD as:

A process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective 'reflection-inaction'. The participants typically undertake the two principal roles of users and designers where the designers strive to learn the realities of the users' situation while the users strive to articulate their desired aims and learn appropriate technological means to obtain them.

(Simonsen & Robertson, 2013b, p. 2)

In an effort to unfold what I have said so far, here are some key concepts and principles to understand what, up to now, has constituted PD.

Giving a voice

A PD practice is a practice that aims at providing a space for the expression of decision-making power to those who are going to be affected by a specific design. This is based on the understanding that design processes are processes characterized by the exercise of power (Bratteig & Wagner, 2012), which is usually exercised by the designer/s. The design process unfolds through a series of decisions that inform the design outcome and, through it, provoke a change in everyday life environment. Since the outcome has a transformative effect over the local context, each decision made is the expression of a certain power exercise (Bratteig & Wagner, 2012; Del Gaudio, Oliveira, & Franzato, 2014). Therefore, PD aims at promoting a shift in power, allowing those who will be affected by a certain outcome to take part in the process, and have voice in the decisions that will influence their lives. The designer gives up with the monopoly of power, and participants actively participate in defining change.

Here lays the revolutionary feature of PD that subverts the designer centred approach that dominated for most of the former century and that is often still practiced. However, in PD, to give voice means much more than just decentralizing - it means also to recognize that within the same participatory process certain users or stakeholders are more privileged than others (i.e. due to their skills, knowledge, resources they have access to, and reproduction of hierarchical social structures). Therefore, in PD, designers are committed to design ways to acknowledge and counter-act dominant voices within design processes, and to allow the emergence of a plurality of voices and perspectives.
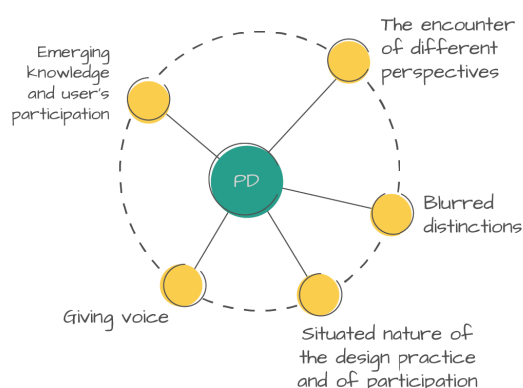
Key concepts and principles of PD, by Maya Chopra, 2021

The encounter of different perspectives

PD researchers recognize that societal transformation can happen when different perspectives meet, acknowledge each other, conflict, and work together in addressing a specific situation (Binder et al., 2011). Through the encounter of different stakeholders and the expression of different voices, the knowledge brought by each participant comes to life. In the space created by the design process, each actor enacts social reality, issues are unveiled and matters of concern can emerge. The process provides the opportunity for reciprocal understanding, for the emergence of collaborative skills, new relationships, and political configurations. This has the potential to challenge hegemonic systems and power exercise. Throughout the process, participants get to know each other, and explore collaboration and new ways of interacting and acting. This is another way through which the design process can transform its participants and the local context.

Situated nature of the design practice and of participation

Design processes take place under specific historical, political, social, and local conditions that should be acknowledge both in the design process and outcome. The situation addressed throughout a design process, as well as its outcome, emerges from the local context and participants' interaction. Local culture, social dynamics, habits and the specific participants, influence the unfolding of the design process. This awareness brings two crucial understandings. First of all, the design outcomes cannot be transferred without losing the potential for transformation embedded in them throughout the design process and based on local conditions. Secondly, this highlights the relevance of local knowledge and input, and how methods, not just outcomes, are not transferrable. In the context of PD processes, the method is, and should be, situated and embodied (Light & Akama, 2012). PD processes and methods not only need to be adapted to the context, but they emerge from local interaction between the designer and the users, and between the users.

Emerging knowledge and user's participation

As mentioned above, PD holds the understanding that users own a specific knowledge and expertise on the local context and on the specific situation addressed throughout the design process, which is unknown and not accessible to the designer on their own.

Designer and the participants bring to the process different knowledge and learn from each other throughout the process itself. However, the designer also has the task of supporting this process of collective learning, sharing, and reflecting together. The designer should ensure and enable participation through designing ways in which participants, according to their own skills and knowledge, can express their ideas, understand the process, and exchange. In this regard, within PD, there is a long tradition of the use of prototypes, mock-ups and other tools in the design process. These tools become a platform to represent the system addressed and future practices, as well as what is possible (often unknown to the participants).

Blurred distinctions

Designer and participants act as peers in the design process. Therefore, PD tries to overcome the separation between designer and user, who hold unpredictable roles, positions, and contributions, during the different phases of the process. The same can be said about the design process and outcome. PD values design as a process, and the different ways in which it manifests itself, as much as the design outcome. There is a strong understanding of the outcome as part of the process. Both process and outcome bring potential for change. Throughout the process, participants evolve together, and transformations happen between what they were, and what they will be, through the recognition and overcoming of individual identity.

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GDS Program news - New Sector Expert joins the GDS team

Adam Weiss

Assistant Professor, Transportation Engineering
Projects: ID73 (Africa) and ID17 (Asia)
Research Assistant: To be confirmed

Dr. Adam Weiss began a tenure-track faculty position in the department of Civil and Environmental Engineering at Carleton University in July, 2020. His research focuses on travel demand modelling with a recent focus on understanding behavioural changes in response to autonomous vehicles. Other key research interests include: Stated preference survey development; Choice modelling and behavioural economics; Econometric modelling; and Transportation engineering in the context of emerging mobility technologies.

Improving the design of upland fish drying technology for female fish vendors in Nigeria (ID47)

Stream 2 - Case study plus prototype

The case study targets fish drying and processing facilities that are primarily used by female workers. As it currently stands, female fish dryers experience excessive strain as a result of substandard technology and working conditions. The research outcomes seeks to alleviate some of the physical strain and increase overall industry value. Methods include obtaining demographic information, identifying desirable and gender-conscious improvements in fish drying technology and/or facilities, and investigating some knowledge gaps. The research will investigate the needs of local communities to create detailed plans for improved drying and processing facilities.

The research team is led by Dr. Uduakobong A. Okon and Mrs. Otu B. Ebeten. Dr. Okon has expertise in agricultural sciences and technologies, gender and development. Mrs. Ebeten has a background in construction technologies and development. The team also includes graduate students in agriculture, history, and international studies from the University of Uyo, who will work with architectural consultants.

Primary investigator: Dr. Uduakobong Aniebiat Okon
Co-Primary investigators: Dr. Otu Ebeten Bassey
Institute: University of Uyo

Left to right: Miss Sito-Abasi Okon, Research Assistant; Miss Edikan Iboro Etuk, Historian/Research Assistant; Miss Ekikere Udofi, Project Assistant; Dr. Otu Ebeten, Co-PI; Dr. Uduakobong Okon, PI; Prof. Ephraim Edem, Chief Consultant (architectural); Miss Hossana Ben, Research Assistant; Arc. Ediomobong Okon, Project Consultant

Developing a hybrid fish dryer to improve processing for small-scale female processors in Nigeria (ID57)

Stream 2 - Case study plus prototype

The research project involves the development and integration of a solar and biomass-powered fish dryer in Lagos State in rural Nigeria. Current methods of fish drying and preservation are inefficient and negatively impacts on health and well-being. The research plans to co-produce a hybrid solar/biomass fish dryer with local end-users, primarily a female labour force, to reduce the negative effects of the fish preservation process. Problems such as energy intermittency and inefficiency or waste in the process will be targeted, as well as identifying requirements that are unique to the female labour force.

Principal investigator Dr. Kafayat Fakoya has background in fisheries biology, with interests in gender, food, and nutritional security. Along with co-investigators, AyoJesutomi Abiodun-Solanke, Prof. Adenike Boyo, Prof. Shehu Akintola, and Dr. Kafayat Ajelara, the team is collaborating with three partner organizations to carry out the project and train students.
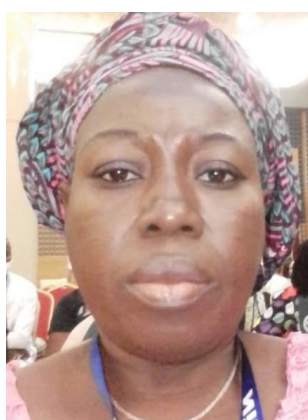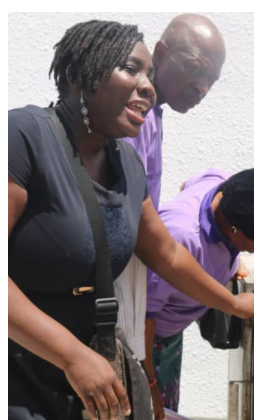
Primary investigator: Dr. Kafayat Adetoun Fakoya
Co-Primary investigators: Ms. AyoJesutomi Abiodun-Solanke, Prof. Adenike Boyo, Prof. Shehu Akintola and Dr. Kafayat Ajelara
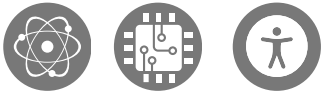*Institute*: Lagos State University

Right: Prof. Shehu Akintola

Below, left to right: Dr. Kafayat Fakoya; Ms. AyoJesutomi Abiodun-Solanke; Dr. Kafayat Ajelara; and Prof. Adenike Boyo

Designing support services for women experiencing workplace harassment in Pakistan (ID38)

Stream 2 - Case study plus prototype

This project aims to develop guidelines to create technologies for low-literate factory women who work in oppressive circumstances. Women's experiences will directly support the development. It also seeks to develop a prototype application that would give women access to a safe, private and anonymous network to share experiences of workplace violence to find support.

The interdisciplinary research team has done extensive fieldwork in Pakistan. The team's expertise encompasses: computer science, human-computer interaction, women's labour, development economics, and gender and feminist theories. Dr. Mustafa's work focuses on adopting a gendered approach to the design and development of technologies for women in patriarchal contexts, like Pakistan, and leads the design aspect of the project. Dr. Majid is a development economist and leads the case study component.

Taken during the team's qualitative data gathering in one of their target communities

Primary investigator: Dr. Maryam Mustafa
Co-Primary investigators: Dr. Hadia Majid
Institute: Lahore University of Management Sciences (LUMS)

## Developing new construction techniques based on the work of women in Brazil (ID88)

Stream 2 - Case study plus prototype

The research project is based on a housing movement called "Mutirao", which emerged at the end of the 1980s, where residents construct residential areas on the outskirts of populated cities in Brazil. This collective activity is usually led by women (around 80%), and they organize, coordinate and work on-site and in management. The project aims to work on the organizational design of construction sites, materials, tools and/or protective pieces of equipment, in order to support women working in the construction of their homes. Experimental research will be carried out in laboratories and through prototyping. The aim of the study is to create manuals and equipment for construction sites led by women, reduce the risk of accidents, search for techniques that are less harmful to builders' health, and collectivize and de-hierarchize the knowledge of construction.

The research team consists of five professors who act as consultants for gender and technology, production systems, graphic design, communication, ergonomics and accessibility design. Dr Ramos' expertise is in urban design and gender studies and she has worked with mobilizations for the right to housing. Co-PI Amanda Azavedo Nunes' expertise is in civil engineering and urban social movements.

Primary investigator: Professor Diana Helene Ramos
Co-Primary investigator: Amanda Azevedo Nunes
Institute: Universidade Federal de Alagoas (FAU/UFAL)
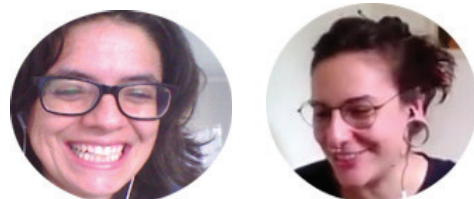
Left to right: Prof. Diana Helene (FAU/UFAL) and Amanda Azevedo (NIDES/UFRJ) *(team photos continue on pg.8)*

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

Stream 1 -
Case study

This case study qualitatively analyzes the individual and social well-being of female breast cancer survivors who underwent mastectomies in Pernambuco, Brazil. The project will include workshops, interviews and exhibitions. Workshops using different techniques, such as clay, photography and other mediums will help to understand how artifacts are used as a strategy to improve self-image and rebuild identity during the different stages of breast cancer treatment. The findings will be shared across academic and non-academic circles in order to raise awareness and support female breast cancer survivors.

The team consists of three professors and two students of Design at Federal University of Pernambuco. The PI Ma. Débora Ferro, along with Co-PIs Dr. Kátia Araújo and Dr. Rosiane Alves add different perspectives to this project. Their expertise includes product analysis and development, ergonomics, accessibility, anthropology, consumption, body, and gender themes.

Primary investigator: Ma. Débora Ferro
Co-Primary investigators: Dr. Kátia Araújo and Dr. Rosiane Alves
Institute: Fundaçãode Apoio ao Desenvolvimento da Universidade Federal de Pernambuco (FADE-UFPE)

Top left to bottom right: MSc. Débora Ferro (PI); Dr. Kátia Araújo (Co-PI); Dr. Rosiane Alves (Co-PI); Jullian Araújo (BSc Design Student); Emília Dias (BSc Design Student)
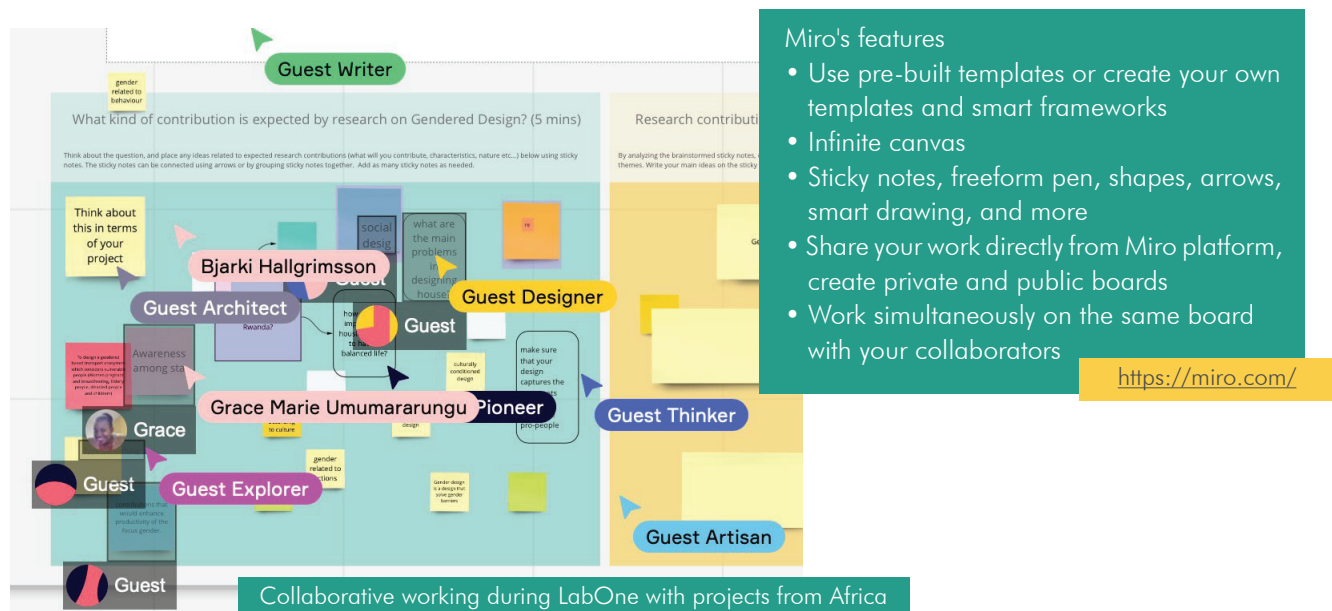
INSIGHTS FROM THE FIELD

In this issue, our Research Assistant Coordinators, Ona, Maya and Najeeba, reflect on working in a virtual landscape and using the online collaborative platform, Miro. We also hear for Adriana Vélez on their project experiences.

The COVID-19 pandemic has shifted many teams to work remotely, which can be a challenging experience. However, this has presented other opportunities for working remotely with team members using online design tools such as Miro. Miro is a visual online collaboration platform. It allows team members to share ideas, visualize and exchange information, plan together, and explain complex concepts in a whiteboard format in real time, regardless of location. The online whiteboard is a useful design thinking tool that promotes collaboration between different stakeholders.

Miro was chosen as a platform for our LabOne collaborative workshop in December 2020 as it allowed for participants from all over the world to customize and create a collective space to visualize together. The creation of the boards for LabOne was intended to take advantage of Miro's visual tools in order to communicate and probe at complex discourses in design. Furthermore, since Miro offered free accounts for educational institutions, this made online collaboration more accessible for the teams, especially during the pandemic. Outside of the educational setting, Miro offers various pricing plans.

One of the limitations of Miro is the learning curve to navigate the features. The support documentation is helpful, however it is only offered in the English language. Other applications, such as Diagrams and Coggle, offer various language options with similar functionalities that can be alternative options for online collaboration. Additionally, Miro can be very heavy on the internet bandwidth usage, which can be unfavorable if you have unreliable or expensive internet connection.

As mentioned, the reason for using Miro during the GDS LabOne workshops, was to surface research opportunities, challenges, and collectively brainstorm on the implication of gendered design in the research projects in Asia, Africa, and Latin America. The feedback from the workshops regarding Miro revealed mixed responses. While some had difficulty navigating the platform, which required further explanation during the workshop, others such as project ID80 from Latin America took the opportunity of the application to generate insightful information regarding their project.

Collaborative working during LabOne with projects from Africa

Miro's features
- Use pre-built templates or create your own templates and smart frameworks
- Infinite canvas
- Sticky notes, freeform pen, shapes, arrows, smart drawing, and more
- Share your work directly from Miro platform, create private and public boards
- Work simultaneously on the same board with your collaborators

https://miro.com/

We hear from Adriana María Botero Vélez, the Principal Investigator for project ID 80 on their teams' experiences adapting to a virtual landscape and using Miro:

Anti-patriarchal praxis through design, and collective memory in times of virtuality, by Adriana Vélez (ID80)

The virtualization of life caused by the Covid-19 pandemic has represented a creative challenge for the members of the project "Re-Imagining territories of female autonomy in Bogota, Colombia", led by the Jorge Tadeo Lozano University. The central purpose of this project is the collective creation of a community kitchen as a scenario for the formation of political subjectivities for the Aisha Women's Circle, who lead processes of reflection and community action on the role of women and their autonomy in the Belén neighborhood of Bogotá.

Given the limitations of face-to-face meetings, the collaborative platform Miro, as well as the WhatsApp group, the Meet and the Drive files, have represented the extension of the blackboard and the collaborative spaces, facilitating not only the collective and simultaneous creation, but also the construction of a memory multi-language (academic-popular), multi-format (audio, writing, video, image, photography, etc.) and polyphonic (where tensions live beyond the agreements) that facilitates the recognition of the progress of the project. At the same time, the routes to follow are traced after identifying the traces of the road traveled in these 10 months of implementation of research and creation actions.

The praxis of an anti-patriarchal design that seeks to consolidate this project involves the creation of communicative scenarios where dialogue, collaboration, care and mutual learning prevail. In this sense, the Miro platform in particular has facilitated the materialization of one of the principles of the Systematization of Experiences (Mejía, 2010); research-action methodology selected by the team: the permanent and collective recognition of lessons learned and good practices, as well as the incorporation of the singular and subjective perspective of each participant in the process experienced.

> "Communication is a fundamental part among our Aisha circle; having clarity about all the information is vital to be able to understand, project, move forward and keep the dream of community cooking alive. These platforms that we have used such as Miro, WhatsApp, Drive and Meet, in the development of the project, have been vital as most of the times we connect we can actually engage in conversations, develop collaborative work and organize as a team for the project's goal."
>
> Aisha Women's Circle

Example of the Miro boards created by ID80

RE-IMAGINAR TERRITORIOS DE AUTONIMÍA FEMENINA EN BOGOTÁ-COLOMBIA

Q&A WITH

In this issue, we talk to Bjarki Hallgrimsson, Director, School of Industrial Design at Carleton University and Co-PI for the GDS Program.

Bjarki Hallgrimsson

1. You're one of the Co-PIs, along with historian Dominique Marshall, on the GDS Program, how did you get involved?

I was initially approached by IDRC in the Fall of 2018, who wanted me to share my thoughts about them funding a series of projects that would address Gendered Innovations in STEM fields through a "design challenge" approach. They were inspired by Londa Schiebingers work at Stanford University on Gendered Innovations, but with a focus on bringing this to the Global South. I have been working for years in East Africa on IDRC funded projects and they were interested in my input as my projects were focused on innovation and collaborative methods and I was situated in the Faculty of Engineering and Design. I became interested as I could see the connection with my own work and how important gender-based insights had been in terms of giving my students and the local communities we worked with in East Africa, make more innovative locally produced products and services.

2. Tell me more about your work and design and innovation? What work are you most proud off?

I already had a fairly extensive career in engineering and industrial design consulting before I joined Carleton. As such I had worked with a broad range of clients in different industry sectors including healthcare, automotive, high tech and consumer product development in particular. During the initial part of my career, my experience was that clients came to us with fairly tight specifications and mostly looked for us to address areas like ergonomics, manufacturing and visual attributes that would make a product attractive, desirable, dependable and cost effective. This started changing at the turn of the millennium (ca 2000), when the business world started embracing the word "innovation". Increasingly I started seeing clients come to us looking for new ideas and ways to redefine their product offerings and placing more faith in our ability to innovate.

This also coincided with the publication of the book called "the Art of Innovation", which explained how the design firm IDEO fostered a culture of continuous innovation that sought to expand the innovative potential of all it's employees. The company was hugely successful having developed a number of groundbreaking products for Silicon Valley firms. The book was also a best seller and brought the mindset of innovation to business leaders across America.

As it stands, IDEO was started by three of my professors at Stanford and I had already been exposed and perhaps indoctrinated in their methods. The underlying principle is what we call Design Thinking. This is by now a well-covered subject and one that I am trying to bring into the GDS project as a whole. The basic idea behind Design Thinking is that designerly ways of doing things can be used not only by designers but by other professions as well to allow innovation to take hold. IDEO was so successful at doing this that their busines model eventually changed from designing things and services for clients, to instead helping clients change their culture to be more interdisciplinary and collaborative and to allow more people to have input from the start including a wider range of stakeholders such as the customer and end user of a service.

A lot of the change within IDEO was due to the interdisciplinary nature of their teams. They not only employed engineers, but also social scientists from groups like Xerox Park and also industrial designers. In fact the company was formed as an amalgamation of three different companies with different backgrounds in engineering versus design. This interdisciplinary composition seems rather obvious now, as many design firms embrace that model, but in the past things were more serial and less integrated. It is also extremely important as societal problems have become more complex and urgent. IDEO has also branched out into doing work that has a social focus through their IDSA.org website, which has good resources for teams working on social innovative projects like the ones we do here in the GDS Program. I recommend that all our awardees become familiar with that site as it provides a lot of good tools for non-designers.

You asked me what products I am most proud of, and that depends on the context. One project that I am quite proud of as a consultant is the Nexus Rollator (Humancare). This is a rollator for the elderly and people with gait disabilities and it is the best selling product for close to 15 years here in Canada. The product was developed through looking at the experience of end users and trying to redefine the product. We developed important innovative features that allow the rollator to be more comfortable, easy to store and fold and also eliminated exposed brake cables. Some people would have said at the time it was too risky or costly to develop, but we followed the design approach of exploring a lot of ideas early and then eliminate the bad ones through testing. Prototyping and an iterative approach were key. I also realized that in order to develop a product for people with disabilities, one needs to think of those users as being on a spectrum of ability as opposed to just looking at it as one size fits all. This makes products more universal.

> *"...we followed the design approach of exploring a lot of ideas early and then eliminate the bad ones through testing. Prototyping and an iterative approach were key."*

Walker Rollator Nexus 3 (n.d.)
Retrieved from https://starkmans.com/pub/media/catalog/product/cache/
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After coming to Carleton I realized when working with students, they needed to think of prototypes not as final "proof of concept" but rather as tools of development. Mockups and simple prototypes work extremely well in terms of getting feedback from a wide variety of stakeholders. This research ultimately led me to write a book called "Prototyping and Modelmaking for Product Design" that is available in English, Spanish, French, Mandarin and Korean. It is of course something I am proud off, and I think it could also serve as a resource for our awardees in terms of how to think about prototyping in general. It focuses on physical prototypes, but the philosophy does extend to systems and services.

Lastly, I have been using these methods collaboratively with NGO's and also through cross disciplinary projects with colleagues in other departments here at Carleton. I am proud to be affiliated with Institute of African Studies as I both grew up in East Africa and also because I have had the good fortune to work with local communities of People with Disabilities (PWD) in Uganda and also the Maasai women organizations like Tembo in Tanzania. I think over the years the NGO's, local communities and my students alike have benefitted mutually from working together on exciting innovative projects like locally produced wheelchairs and tricycles and small water projects.

3. Why is risk taking and prototyping important in design and STEM?

I have a background in engineering as well as product design. What I can say is that many STEM fields, and business sectors as well, are inherently risk adverse and perhaps for good reason. The cost of failure can be costly, tragic and career ending. As a result, we see companies and professionals who would rather do slightly incremental innovations than take bigger risks. Unfortunately, this also leads to possible failure down the road when a competitor suddenly comes out with a game changing approach or certain marginalized people at the fringes struggle to use products and services that have not been developed with them in mind or through consultation.

This brings me to the prototyping mantra developed by professor David Kelley at Stanford and IDEO, which is to 'fail often to succeed sooner'. This means that more innovative ideas need to be developed early and that through an experimental and iterative approach, the ideas are allowed to evolve through identifying where they fail and how they can be improved. It is important that this process includes alternative parallel ideas that can come together in terms of new iterations that perhaps combine the best parts of previous iterations. It is also important that products and services be considered not only as technical problems requiring a technical solution. I cannot think of a single product or service that does not include a human being.

I would encourage our awardees to think iteratively. A more radical idea that seems impossible at first, may evolve into something that is actually doable. Similarly, by comparing various approaches and co-developing them with the people who they are intended for, we gain new insights and quickly discover some of the fallacies of our own assumptions. Developing something that works in a technical sense, but that has no appeal or does not work for cultural or other human reasons, is ultimately a failure. Have the failures happen in the beginning, where they can be recorded as data and not in the final stages when everything is said and done.

"Developing something that works in a technical sense, but that has no appeal or does not work for cultural or other human reasons, is ultimately a failure."

STEM fields tend to deal with research that is investigating absolute and quantifiable questions. At the same time, in order to be creative, we must also be imaginative and look at questions that deal with 'what could be', this is usually harder to quantify, but at the same time we gain new insights and breaktroughs by thinking differently. This is why we have adopted the term STEAM that adds the Arts to STEM to acknowledge the social implications and creative mindset of social sciences as well as design. Stephen Jobs was able to think differently. The first iPhone pretty much used technical components available to all the major cellphone manufacturers, but it required a new way of thinking and from what I know from behind the scenes, an incredible amount of prototyping. This is not just for products but for services, which is why we are seeing explosive growth in the field of User Experience Design in the service and software sector.

Locally produced Tricycle that converts into a Wheelchair, co-developed by Carleton University with Canugan Disability Support, Kasese District Union of Persons with Disability (KADUPEDI) and Katelemwa Hospital in Uganda | Bjarki Hallgrimsson (left , Co-Pi GDS), Dr. Emmanuel Mutungi (Regional Expert for GDS) and Katelemwa staff in Kampala, Uganda.

4. What can you see being one of the biggest challenges for the GDS research projects?

Undoubtedly Covid 19. At the same time, I am reassured by how collaborative everyone has been and how we have all managed to flip online. I also think there is a lot of beneficial learning we have gained from the experience that informs us for future ways of working. Tools such as Miro and Zoom have been instrumental in continuing the conversation and mutual efforts. It is no doubt challenging for many people who find themselves in different time zones and perhaps with less-than-ideal internet connectivity, but I am also impressed by the level at which it is all working.

I also feel that we all need to realize how innovative the whole project is. Looking at gendered innovations through the lens of STEAM and in the southern hemisphere is actually groundbreaking in terms of both the methodological focus and geographic scope. I am sure that there will be many challenges for STEM teams that have a lot of technical challenges already, to also add these layers of social gender issues and design dimensions (i.e bringing it to be a STEAM project), but that also makes the projects more exciting. We do not have unrealistic expectations, but we hope to learn from our mutual experiences and move forward together with our partners.

Lastly, from a personal point of view, I am extremely interested in how the projects use the prototyping method and apply it to their own projects and what that might look like in terms of the specific tools and methods used. I think that being creative about exploring new ideas and allowing insights to evolve is the key message...and fail often, in a calculated and safe manner, in order to succeed sooner.

The Art of Innovation: Lessons in Creativity from IDEO (2001), Tom Kelley with Jonathan Littman. New York: Doubleday

IDEO.com - award-winning design and development firm that fosters a culture and process of continuous innovation.

IDSA.org - Industrial Designers Society of America

Prototyping and Modelmaking for Product Design: Second edition (2019), Bjarki Hallgrimsson. Lawrence King Publishers

Design framework
From: **Prototyping and Modelmaking for Product Design: Second edition (2019), by Bjarki Hallgrimsson**
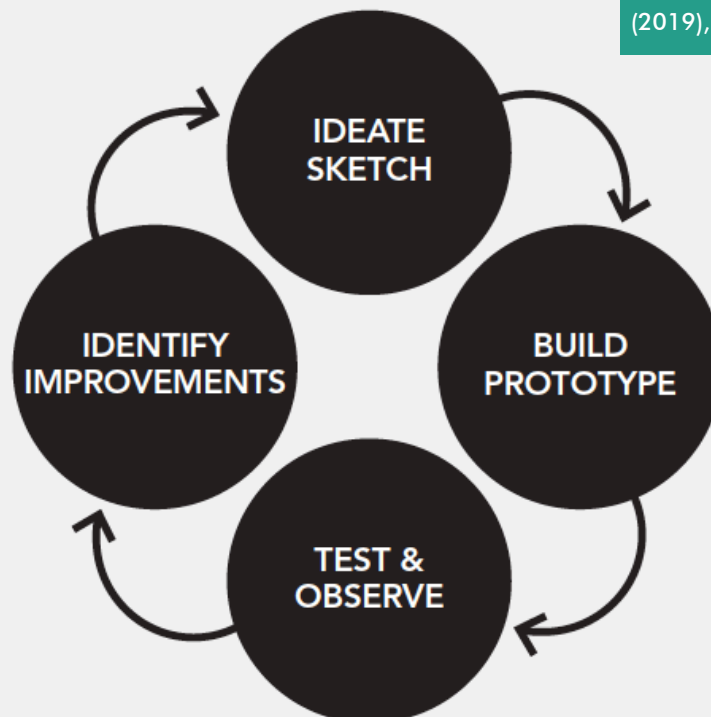
A CLOSER LOOK

Yoko Akama, **Regional Expert for Asia, provides a reflection on the** ServDes.2020 conference **(Service Design and Innovation) that she co-chaired and hosted at RMIT University (Melbourne, Australia, Kulin Nations) during February 2-5, 2021.**

This all-online conference was a watershed event in creating a respectful space for us to grapple with the tensions, paradoxes and pluralities of human-centred designing to generate substantial learning for students, professionals and researchers.

The ServDes.2020 website will soon become a rich repository of the presentations and session recordings where so many had willingly stepped into complex terrains to move beyond assumed or established frames of reference, that have largely been western, privileged and market-centred agendas until now. The diversity of participants and attendees, almost 50% from outside of Europe, was a significant achievement in the history of ServDes Conference series in providing a platform for hearing stories we rarely hear in the dominant design discourses, particularly from Latin America and the Asia Pacific region.

All these contributions together have shaped what kinds of conversations, approaches and ways of being could be possible, if we are open to engage respectfully with plural ontologies and episteme. Our commitment to, not just acknowledge, but to respectfully engage with Indigenous sovereignty was also registered as another significant benchmark.

Yoko Akama - *GDS Regional Expert for Asia, Associate Professor: Communication Design, School of Design, College of Design and Social Context, RMIT University, Australia*

There were over 100 online discussions, presentations, and workshops. These are Yoko's top picks that have key GDS themes, agendas, and issues:

> *ServDes.2020 Tensions Paradoxes Plurality*
> *https://servdes2020.org/*

Theme - Indigenous Knowledges and Decolonising:

Articulatory Respectful Service Design - Norman Sheehan, Honorary Professor, University of Queensland and Dr Tristan Schultz, Relative Creative

Patterning Place - Dr Tristan Schultz, Relative Creative

Designing in response to Indigenous sovereignties - Peter West, RMIT University

Experimenting with design tools for just public services - Paula Hardie, Griffith University, Brisbane

What the Popol Vuh can teach design - Ricardo Sosa, Auckland University of Technology

Telling stories: Moving beyond empathy tools to reciprocity - Giti Datt, University of Technology, Sydney; Lucy Klippan, University of Technology, Sydney; Helen Eason, Nelly's Healing Centre; and Juanita Sherwood, Nelly's Healing Centre

Design enabling pluralities of voices, re-distribution of power - Satu Miettinen, University of Lapland, Finland and Nicola Morelli

Aotearoa New Zealand Panel: Rangatirangatanga mō te Oranga – Innovation in systems and service change for equitable cultural spaces - Desna Whaanga-Schollum, Founding member Ngā Aho Chairperson; Angie Tangaere, Social Intrapreneur, The Southern Initiative; and Penny Hagen, Director, Auckland Co-design Lab, The Southern Initiative

Theme - Feminism, Gender, Race:

Bespoke tools for co-designing diverse and inclusive feminist futures - Hannah Korsmeyer, Monash University and Allison Edwards, Wonderlab, Monash University

Categorising people: Tensions in critical approaches to design - Kate McEntee, Monash University

Designing for informal services: A participatory approach to prevent sexual violence within a university - Bridget Malcolm, UTS Design Innovation Research Centre

Teu le Va (nurture the space) in-between intersectionality - Marion Muliaumaseali'I, RMIT University

OPEN LEARNING

Here is a selection of recommended readings from our expert network. There have been a number of other recommended readings and references already mentioned earlier in the Bulletin.

• Büssers et al. (eds.), (2021). Gendered Configurations of Humans and Machines: Interdisciplinary Contributions. Verlag Barbara Budrich

This volume provides an interdiscplinary approach towards questions of how do digitalization and artificial intelligence affect gender relations and how intersectionality can be newly understood in an increasingly internationally networked world. This volume is a collection of contributions deriving from the 'Interdisciplinary Conference on the Relations of Humans, Machines and Gender' which took place in Braunschweig (October 16-19, 2019).

Listening (a conversation around maps and stories) - online event from February 25, 2021
with Anne Kelly Knowles and Margaret Wickens Pearce | Centre for Oral History and Digital Storytelling

In this conversation, two mapmakers and friends will reflect on how stories figure in their work, in particular, stories that are difficult to tell and difficult to hear.

• Onafuwa, D. (2018). Allies and Decoloniality: A review of the Intersectional Perspectives on Design, Politics, and Power Symposium. Design and Culture, 10(1): 7–15

This article reviews the Intersectional Perspectives on Design, Politics, and Power Symposium which was organized by the Decolonising Design Group. The conference examined the theory of intersectionality, cultural oppression in design, and the call for decolonization in design.

• Oudshoorn, N., Rommes, E. and Stienstra, M. (2004). Configuring the User as Everybody: Gender and Design Cultures in Information and Communication Technologies. Science Technology and Human Values 29 (1): 30–63

The article shows how configuring the user as 'everybody' and the use of the 'I-methodology' are important constraints in the development of technologies that aim to reach users in all their diversity.

• Costanza-Chock, S. (2018). Design Justice: towards an intersectional feminist framework for design theory and practice. Proceedings of the Design Research Society 2018

This article begins with a background on the concepts of intersectionality and the matrix domination. The article proposes a definition of design justice as a framework and expands on the design justice principles.

• Jung, H. (2014). Let Their Voices Be Seen: Exploring Mental Mapping as a Feminist Visual Methodology for the Study of Migrant Women. International Journal of Urban and Regional Research, 38(3): 985-1002

A piece on how easy it is to misunderstand the intentions of people who are participating in a project at a disadvantage, for example due to power imbalances and language barriers, and to underestimate and patronize migrant women. The researcher describes their project that involved interviewing migrant women with sketching and mapping methods.

If there is a particular journal, article, book or chapter that you are interested in, but you are unable to access this through your local library, please contact the Program Coordinator.

If you would like to submit a suggested reading, event, discussion or video, please complete this form.