Literature Review:

Introduction

Male dominated societal norms have seen women consistently excluded from digital design processes. The question, "how do we develop digital design processes with African women at the centre?" seems like one that has been ignored and not prioritised, especially in a world where women face harsh inequalities, which are further compounded for African women. Even services specifically targeted towards women (such as maternal and infant health) are designed taking into consideration third party stakeholders other than women and children for example, health care professionals. By ignoring African women in service design, we are ignoring approximately half of the continent's population for services that are utilised by the entire population.

Understanding gender dynamics in diverse sectors and adopting design processes that take into account these differences, requires intentional effort and collaboration amongst various stakeholders through systematic and effective methodological approaches. Allocating resources to familiarise oneself with contextual realities and nuances is fundamental in achieving success of service interventions amongst communities. More importantly, analysing the complexities in relationships across realities, which exist even within the same communities, and breaking down the complex identity politics beyond binary gender terms is argued as a winning strategy in inclusive service design. Taking into consideration the intersection of gender and other markers such as income, age, education, marital status, tribe, and geographical location reveals how even individuals of the same gender within the same community have significantly diverse experiences. This naturally complicates the design process.

How then do we design common services for such diverse groups? How do we make service design more inclusive to African women who suffer inequality in society and are marginalised? Admittedly, the design process has evolved over the years from more user centric processes to more participatory methods, which has subsequently improved research and project outcomes. This literature review attempts to vocalise how gender dynamics play out in the design process. By inviting users of the end products as experts and including marginalised people as participants in the design process, we see that this positively impacts communities by not only having services that work, especially for marginalised groups, but also the contribution to more awareness of issues and problems affecting society.

Co-Design process

Co-design refers to collective creativity of designers and people not trained in design working together in the design development process [1]. We see that co-design, a variation of participative approaches, "user as partner", is often confused with co-creation, which is a broader term referring to collective creativity. Co-design is therefore, a specific instance of co-creation [1]. A central feature of co-design is the transition from viewing designers as experts and potential users as informants to engaging stakeholders as partners [1].

In typical co-design or action research projects, once information has been gathered about the prevailing problem, the next steps would involve prototyping and settling on a working solution after a few engagements. This approach, especially in development contexts, suffers from structural problems that often make true co-design impossible because target users don't feel comfortable criticising or even using technology [2]. In these cases we see the designer taking design decisions based on their interpretation of the feedback from the users. Molapo et al. [3] argue that one can develop a design process that is considerate of their users' literacy and experience. This can be done by prioritising the development of confidence level and experience of participants, by adopting techniques common in participatory workshops e.g. role playing and brainstorming and the use of high-fidelity prototypes [4].

In order to support participants prepare for the design process, researchers adopt a technique called co-design readiness. Co-design readiness is where participants unfamiliar with the design process gain confidence and can voice their ideas and opinions towards solving their problems. C. Mburu et al. [5] observe that having separate sessions, and pairing up methods, empowered stakeholders to generate numerous design ideas despite the group dynamics that were previously prone to conflict and exhibited power imbalances.

Co-design is seen to get more complicated when researchers are investigating sensitive topics e.g. health or conducting research with vulnerable populations. Past studies also reveal new complex challenges such as power imbalances, dilemma in responding to vulnerable respondents, loss of respondents, difficulty in recruiting respondents, and boundary maintenance between the researcher's role and objective of the study. By researchers familiarising themselves with the research context and the participants before conducting research in sensitive contexts, employing appropriate research methods that are emotionally safe for vulnerable participants, practising self-care and avoidance of compassion fatigue, they can overcome co-design challenges. An illustration of how vital methodology is, was well illustrated in a research study by C. Mburu et al. [5] which sought to support mothers of preterm infants using technology in Capetown, South Africa. The study was focused on identifying methods that empowered and fully engaged the participants, such as role playing that allowed the doctors to empathise with the mothers' experience, understand their need for communication, and collaborate in new ideas of interacting better with mothers who came to their hospital.

Participatory action research

Participatory action research (PAR) or action research, as it is sometimes known, has in its implementation and underpinning philosophies of an action purpose. This *action purpose* differentiates PAR from methods whose primary aim is to research or investigate [6]. This approach puts together the expertise of the systems designers/researchers and the situated expertise of the people whose work is to be impacted by the change. It is important to stress the importance of relying on the people's *experiences*, and availing to them *resources* to enable them to *act* in their current situation [7].

PAR is defined by its collaborative and participatory nature, PAR therefore moves right away from the idea of the 'outside expert' coming into a community to examine, theorise and propose solutions because the community of research interest is involved at every step as active partners.

We can see both co-design and PAR being adopted and what this looks like is the case in Lesotho [3], where they were designing a feedback-integrated platform for community health education using mobile multimedia. The methodology involves empowered design which refers to designing technology, but making sure that the community can mold the resulting design rather than forcing the community to mold itself to our design [8]. Additionally, the methodology allowed for empowering for participation, which prioritises devising the most ideal ways to engage participants (in this case community health workers, CHWs) and empower them to participate in the design and research process. Thus building in them the confidence and capability to articulate their needs and devise or propose technical solutions [9]. This study began by understanding and discovering the needs of the nurses and CHWs in order to foster discussion around the existing solution and possible improvements. At this point their participation went as far as narrating their struggles with the mobile phones used as a result of the limited prior experience and possibilities existing in smartphone and app use. In order to amplify their voice in the design process they had to be empowered to a point where they could easily contribute ideas, analyses and experiences. Molapo et al. understood that to co-design immediately was not their methodology, but to consult with each one of the CHWs and nurses in order to discover their aspirations. From this consultation they would develop a simple technology artifact that implements these aspirations as a starting point [10]. Following the artifact development, came the exploration and ownership stage where the objective was for the CHWs to familiarise themselves with technology (both the mobile phones and the educational app) with a following workshop to check in on the learning progress. Once the exploratory PAR cycle came to an end, the team introduced the productive PAR stage, through a reflection and planning workshop, that jump-started the beginning of true participation and collaborative thought. This stage was enhanced through the use of role playing and brainstorming techniques which helped the nurses and researchers empathise in the CHWs experiences as well as helping the CHWs feel involved and relevant to the project progress. After this stage it was time for the deployment and training of the improved upon app after which a workshop, complete with another round of role playing and discussions. A month later, a second workshop was held to check in on the progress with a plan to end the current PAR stage with a reflection and planning workshop.

We see that this specific approach of introduction of an exploratory artifact, gave the CHWs an opportunity to get more comfortable with technology to enhance their feedback and articulation of ideas, through exploration and independent discovery through use [3]. Molapo et al. argue therefore, that the quality of the CHWs' participation in the design process would have been compromised if they engaged in the design activities too early. Additionally, the CHWs capability to participate was enhanced by long deployments periods and frequent engagement through activities like the workshops and role playing. One final observation was the importance of the researchers communicating clearly and consistently regarding the concept (the feedback mechanism) and the artifact (the app/tool used to communicate the feedback) and that if the artifact failed to convey the concept, it could be abandoned [11]. Afterall, the objective is to design technology that is most beneficial and effective for the users needs or work.

Participatory Design (PD)
In a research project investigating the possibilities and challenges of do-it-yourself (DIY) assistive technology (AT) in Western Kenya, we see a great example of how PD is adopted. By including the perspectives of multiple stakeholders and utilising an open source DIY-AT prototyping platform (TalkBox) as a technology probe, to better comprehend the factors attributing to the development and uptake of this type of technology [12]. A well-designed technology probe is technically simple and flexible with respect to possible use. It is not a prototype, but a tool to help determine which kinds of technologies would be interesting to design in the future, where we expect the users to adapt to the new technology but also adapt it in creative new ways, for their own purposes [13]. The research team implemented an interdisciplinary workshop facilitator training and focus group where a full day training took place to introduce the concept of DIY-AT and demo the workings of TalkBox. Afterwards, a focus group took place to discuss how the technology could be adopted by specific students, from which the researchers took detailed notes and administered pre and post questionnaires. Soon after, the workshop facilitator teams (formed after the training) conducted a series of workshops (community engaged workshops) where they showed parents, students (with disabilities) and other teachers how TalkBox worked and how it could be customised for other students with disabilities. At the same time, a stakeholder focus group discussion was held with governmental and non-governmental representatives of departments and organizations committed to providing support and services to people with disabilities to discuss the social, technical, and economic barriers to accessing assistive technologies in the region. This group was also shown a demo of the TalkBox and thereafter discussed the possibilities of DIY-AT. It was observed that the students showed signs of being excited and engaged while using the technology, which is in accordance to previous research that has shown people with disabilities, their family members, teachers, therapists or volunteers who design and fabricate DIY-ATs can feel a boost of empowerment and agency [14].

While PD has been evolving over the years, there exists different understandings of 'participation' by societies that is determined by local value systems. Friction can be encountered between designers and users due to differing socio-cultural value systems. As Winschiers et al. [15] point out *"local participatory performance is guided by implicit and explicit rules that aren't always obvious to community outsiders."* It is for this reason that PD needs to

be dynamic in order to account for these diversities existing not only amongst individuals but also in reference to cultures, thus there is no single technique of conducting PD [16] [17]. Participatory approaches thus tend to be behavioral [18]. Furthermore, in a project exploring how information and communication technology can be used to enable both civic and cultural participation, it was realized that *"the close integration of – and skills transfer between – the research team and participants would be essential to the successful implementation of co-creative community projects."* [19].

Generally in the development context, participation refers to the process by which disadvantaged people have the opportunity to influence decisions that affect them and is directly attributable to project success [20]. In IS projects, participation is observed to fail when it ignores context, reality and other factors [21]. Heeks, goes further and breaks down key questions to ask where participation is being considered: 1) What is the political and cultural context? 2) Who wants to introduce participation and why? 3) Who is participation sought from? Do they want to, and can they, participate? As participatory techniques continue to be adopted, the complex hidden workings of power relations have been revealed and broken down [22].

In order to be considerate towards Sub-Saharan communities, this would mean appreciating that the way of life is deeply interconnected within their communities, *"I am, because we are; and since we are, therefore I am"*. (Mbiti, 1990) [23]. In [15] a study exploring how PD can better serve the global but locally diverse village through a knowledge management system in Namibia, the research team adopted a dialogical approach to PD. As compared to discussion, dialogue is based on the respect of all participants, suspends judgement and isn't aimed at convincing other participants of 'rightness' of any opinion, but is a space to co-create. We see pre-existing relationships (one of the researchers originating from the community) cemented the community's commitment to PD and also trust building, additionally seeking permission to do the project, from the village elder (male) and cultivating a relationship between him and each of the researchers is fundamental for PD success. Conducting all interviews in the local language by the researcher (and only translating when absolutely necessary) thus not disturbing the flow of the conversation. When it came to determining the roles and agendas, admittedly external researchers usually have high influence in the entire research process, however in this instance the researcher originating from the village was in control. Furthermore, those in the research team who were younger and female had to assimilate to the local customs by taking on docile roles, regardless of their professional designations. Planned project activities were not imposed on the community so that the research process could naturally integrate itself with the community's practice, this also gave the researchers the opportunity to participate in some community initiated activities. These non-planned activities were later considered as vital for the PD process, which should fit local cultures [24]. Not only is it beneficial for better understanding of community dynamics [25] but also addresses the power imbalance, by creating an equal playing field for participation resulting from performance anxiety and feelings of intimidation due to differences in socio-economic status [26]. However, it's important to note that these activities may not always be beneficial, yet take a lot of time out of the field-work time, so a balance must be struck. To empower community members and actively involve them in the research process, the researchers introduced user generating video-recording devices for knowledge capturing,

also in a bid to reduce the element of outsiders recording everyday occurrences in the community. From the introduction of technology probes we see the increase of confidence in technology usage and gives researchers the opportunity to validate early design ideas in situ.

Gender - Inclusive Design Processes

Society, where we live and work, is inundated by gender differences and gender inequalities which define and impact experiences. According to Oxfam [27] a gender analysis explores the relationships of women and men in society, and the unequal power in those relationships. It brings inequalities to the surface and to the attention of people who can make a difference. By performing gender analysis in all their work, by crafting and implementing programs that consider the needs and perspectives of all genders, they seek to avoid reflecting and furthering these imbalances by eliminating the assumption that their work benefits both men and women equally. A good gender analysis exposes the differences in the lives between men and women, i) the unique barriers each face, ii) how their skills, capacities iii), aspirations differ, iv) how they are often subject to uneven , and division of labour, and they have differing access and control over resources.

When designing gender-sensitive social protection programmes, Tebaldi [28] argues that it is vital to understand and differentiate between practical and strategic needs. Practical needs stem from women's practical experiences, which are defined by unfair systems of labour division based on gender, whereas strategic gender needs arise from women's structurally defined subordinate condition in relation to men (Molyneux) [29].

In the case of public works programmes, we see that they have the potential to improve both community infrastructure and women's quality of life by implementing projects relevant to their needs by making some of their daily tasks less time-consuming. An analysis [27] of these programmes in sub-Saharan Africa illustrates how to include women in public work programmes by being more 'gender aware'. This has been done by: 1)Setting explicit targets for women's participation, 2)Linking mothers and young children in areas of the intervention to nutrition services, 3)Conducting awareness-raising campaigns and including 'soft' public works activities (gender differentiated tasks), which traditionally attract more women, 4)Having childcare facilities on-site and/or by some of the beneficiaries, to encourage women's participation; and adopting flexible working hours and possibility of working half-days due to women's other responsibilities related to the home. In this analysis, it was also observed that where women were the head of the household, it became difficult for them to juggle their household responsibilities and participate in the programmes. Conversely, where men were the head of the household, women often reported lacking control of funds and transfers attributable to their household. This clearly signifies a need to understand gender dynamics, which are constantly changing.

Programme design as illustrated above, goes hand in hand with promoting women's empowerment and meeting their short-term practical needs. That said, such programme design does not fully meet the strategic needs of women, which requires a change in wider policy that addresses the inequalities they face. Tebaldi [27] notes that remaining solely concerned with

women's roles as mothers and wives may only reinforce traditional gender-based inequalities. Such concerns must be accompanied by other measures seeking to promote women's empowerment, such as links to training and services that support their access to the labour market. Investigating and addressing gender differences in agriculture through program design, gives these agricultural programs a better chance at meeting their objectives. Adopting gender inclusive tactics like allocating men physically intense roles like land preparation, while women take up tasks such as weeding and other post-harvest processes, make it easier for women to participate. Differences in behaviour, such as the fact that women spend more income in their control on food and children's healthcare, reliance on social networks and social networks as compared to men [30]. These in addition to differences in access to agricultural resources and inputs between men and women, are important factors to be cognisant of in order to achieve successful project outcomes.

In the technology realm, we observe that while the people who are using applications, web platforms and products are getting more diverse than ever, unfortunately the tech industry is not. This makes it harder for women to foray into or even thrive in design careers. It goes without saying, if fewer women are venturing or staying in design careers then there's a lower interest in design as a career due to fewer female role models [31] [32] [33].

Designing for inclusion begins with recognizing exclusion. By focusing on excluded people and identifying bias in design and leveraging them into design solutions, you're able to identify better design constraints which subsequently leads to products and services that can be used by more people [34] [35]. However, as we continue to delve in participatory methods of research, it is important to acknowledge that technologies and technology projects are not gender neutral even when they are designed and implemented using participatory processes [36] [37].

Schlesinger et al. [38] argue that as Human–computer interaction(HCI), the study of the design and use of computer technology, focused on the interfaces between people and computers, continues to evolve, the appreciation for the term "user" has also progressed. With the acknowledgement that it represents an ever expanding and diverse group of people. In the same vein it is crucial to note that each "user" is fractured into different status based on markers such as income, gender, race, and age. This affects how they interact with different services or products in society. Williams and Artzberger [39] state that the quality of women users' experiences of ICTs will likely be affected by how their marginal gender status interacts with other marginal statuses they may have in society, such as minority race, low-income, or advanced age. Not only does the electronics industry fall into the trap of 'designing for everybody', but also binary categorisation when designing for women. When designing technology to support the safety of transgender women and non-binary people of colour, Starks et al. [40] noted that there barely exists any research on how they use technology. This translates into design decisions that result in a lot of technology not being designed considering trans-users.

Historically, since computer code is primarily controlled by white men of European origin, it typically reflects their cultural biases and corporate business interests [41] [42]. This effectively

illustrates the power dynamics embedded in technology which subsequently leads to the disempowerment of women and ethnic minorities, who are left out of the design process and represent the minority in design fields. Williams and Artzberger [39] posit that technology thus has the power of being a weapon for powerful groups to intentionally shape society and gender relations, and a tool of well-intentioned, but ultimately ignorant, privileged people to unintentionally shape society and gender relations.

This brings us to the concept of intersectionality, a term coined in 1989 by Kimberle Crenshwaw who built it on the conceptual work of others. Intersectionality in HCI introduces a focus in complexity of identities and the impact these identities have on context and design, thus promoting equity within HCI. While focusing on a singular category such as "gender" (rather than investigating multiple identity variables) may prove easier, Schelsinger et al. [38] posit that it may also result in less nuanced and accurate interpretations. It has also been observed that research focused on gender is generally referring to women. When men were the focus of research, they are rarely the only group studied. This results in an over-reliance in binaries – a potential blind spot in research. Feminist HCI often falls into this gender trap, by also focusing on only women when mentioning 'gender'. However, if correctly applied, it should be based on methods and ethics centred around equity-oriented values and qualities; thereby avoiding the further marginalisation of women in technology.

In a research study based in South Africa to study the gender dynamics while setting up a community network, we see researchers explore how exactly participatory methods empower women given pre-existing practices and the context of patriarchal cultures within community dynamics specifically in african culture by asking questions seeking to unpack deep-seated power relations. Being cautious to avoid a westernised lens, the researchers view a 'traditional society' as *non-reductive and does not infer something that is static and backward* and that consider that *"culture is performed and enacted, rather than inhabited and received, and cultural categories are implicated in various forms"* [36] thus culture is dynamic rather than static [43]. It is interesting to note that the paper does not seek to theorise ways to ensure women's equal participation in the design process, which as I have observed is a gap existing in participatory design methodology. They focus on "assessing the accessibility and flexibility of systems, especially considering women's empowerment, freedom and autonomy", rather than documenting actual strategies and steps to make the design process gender inclusive.

Feminist qualitative research methodology, which this study [36] adopted, seeks to *actively remove the power imbalance between research and subject; is politically motivated and has a major role in changing social inequality; and it begins with the standpoints and experiences of women* [44] [45] [46] and for these three reasons it methodologically differs from traditional research. In order to adequately analyse the researchers' positionality (the conditions under which a person's position in a social structure arises and stabilize), which is constantly negotiated in each and every interaction between the researcher and participants [47] [48]; the researchers break down each of their 'identities' in order to bring awareness to the potential for these identity markers to affect the outcomes of the study. In the course of their work, they additionally realised the tensions that could potentially be brought up by investigating 'gendered

participation' and the political complexities of this theme. Very much like our discussions within our thematic group which have revealed that analysis of gender as a concept, is not only multi-layered but could potentially raise misunderstanding due to varying personal identities and political leanings. Similarly as is in the case of Zenzeleni Networks [36], this has the potential to impact our research and any programmatic work we pursue as the GeDIA network.

A summary from the in-depth interviews with women in the community revealed that women had no information about Zenzeleni Networks (community network), were not adequately involved in the set up to have information about it and were apprehensive about talking about it perhaps due to the potential of communicating the 'wrong' thing, or were outright disinterested. Studies have found low levels of self confidence was often connected with low levels of education, which is more common amongst women [49]. This was also observed in Nepal, during a project seeking to improve women's maternal healthcare services, where female healthcare workers were noticeably less engaged in the presence of a male doctor perhaps due to 1) his higher education and 2) hierarchical differences in their patriarchal society [50].

The researchers' observation in the course of the project, was that women tend to be reserved, which is also translated as respectable gender behavior. So the question that is raised is, out of the one or two women who speak up how representative is their voice? Further, how can you measure participation of women in spaces where power imbalance is rife, which subsequently results in their exclusion from participation? This illustrates some unique challenges of running a participatory research study in a rural community. A gender gap is inevitable in the setup of a patriarchal cultural system, which in itself is constructed around the concept of 'gender mainstreaming' [51] (the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels). This is due to the fact that we do an analysis of women separately from men rather than their comparative relationship in society, while also basing the analysis in binary terms. In analyzing project performance, when it comes to analysing whether gender equality has been achieved, evaluation techniques often fall in the trap of using the binaries of exclusion and inclusion, (an instrumental tool, particularly to explore the impact of gendered relations in technological solutions and interventions). Yet [52] [53] argue "gender-mainstreaming has failed as a strategy towards effective and sustainable change towards gender equality and women's empowerment in development interventions" This is for a couple of reasons, such as: substandard evaluation techniques that 1) treat gender mainstreaming as a goal rather than a long term strategy towards gender equality 2) most of the gender benefits identified deal with women's practical needs, not their strategic interests.

This means that without taking a closer look at cultural codes and structures, there is a potential risk of compromising and underrepresenting women's agency and their capability to negotiate their participation in the project. [36] This binary outlook also ignores what women's participation looks like regardless of how gendered it may be and their contribution to successes and longevity attributable to the project. Going back to the question of 'who participates, and how?' It was observed that in the case of Zenzeleni Networks women were working on the project thus 'participating' but their roles regardless of how important, were invisible. This is due to the fact

that these tasks fall into the category of 'domestic chores', which are largely unrecognized and unappreciated in a patriarchal world [54].

Additionally, we see women's contribution is activity specific [55] and their lack of involvement in decision making thus being strongly associated with gendered performance and not contribution to the information economy [56]. Similarly in rural Chile, men are the head of the household and in charge of the budget thus spending money on information or communication services is a much more difficult proposition for women who often did not control their own budget. [28] [49] This is evidence that access to ICTs is subject to pre-existing gender norms. According to Agarwal, [55] such complicated gendered participations are categorized under what she calls "participatory exclusion". She argues, "they stem from systematic factors and can, in turn, unfavourably affect both equity and institutional efficiency.

It is also observed that when the monthly meetings occur, despite having three women present out of the cooperative team of seven, their role doesn't include leading discussions or decision making, thus further marginalizing other group members, women and youth from actively and equally participating in the project [57]. This paper introduces a new angle of looking at women's participation in design, rather than viewing it as exclusion of women, we are invited to consider it as gendered participation because it is evident women actively participate, but how they are participating is what we should take a closer look at.

These thoughts on scrutinising the nature of participation are further echoed by Phakeng [58] who argues that while statistics are important, words matter more. With all the demographic transformation in spaces where we see more women represented, does it actually translate to equity in leadership more broadly? It is observed in society that the achievements of women in, say government, mask the real power relations within social and political movements. Hassim [59] further argues that questions concerning who has voice and agency remain largely obscured.

Conclusion

The extent to which design is by women and not simply for women could be answered in two ways. As illustrated in the review, the design space is overwhelmingly male, for reasons such as lack of female designer role models, a symptom of a male dominated design space, unfavourable working conditions for women and unconscious bias against women in technology [60]. Alternatively, when analysing participatory design techniques we see women being included in the process, but their participation is exclusionary due to the nature of tasks they perform. In this case I am hesitant to outrightly say that women are entirely excluded from the process, because this would in effect be ignoring and belittling the contributions they continue to make in design processes.

Regardless of these two angles, participatory design and research methodology in Sub Saharan Africa (SSA), does not specifically cater for women and their intersectionalities, as it does outside the continent. In SSA design processes, women are presented as binaries, and gender analysis is constructed as 'men versus women'. Beyond our borders, we see the implementation of intersectional HCI, where users are effectively assessed based on various identity markers: sexuality (beyond binaries), gender, geography, age, economic and social status.

In the course of the review, we observe that cultural and social norms are seen to affect the ways in which women can participate in the design process. Factors that designers and researchers, who exist as 'outsiders' to the communities they research, can only identify and not permanently shift for the purposes of service design and eventual project success.

This in itself, presents a unique opportunity to shift what gender-inclusive design processes look like and explore more intentionality in improving the quality of women's participation in design processes. However, I am also concerned whether the inclusion of women qualitatively in design processes is viewed as a luxury, much like the internet was thought to be as a result of barriers to entry [61], before it was determined to be a basic human right.

REFERENCES

Co-Design
1. Elizabeth B.-N. Sanders & Pieter Jan Stappers (2008) Co-creation and the new landscapes of design, CoDesign, 4:1, 5-18, DOI: 10.1080/15710880701875068
2. Sussane Bodker (1996) Creating Conditions for Participation: Conflicts and Resources in Systems Development, Human–Computer Interaction, 11:3, 215-236, DOI: 10.1207/s15327051hci1103_2
3. Maletsabisa Molapo, Melissa Densmore, and Limpho Morie. 2016. Designing with Community Health Workers: Enabling Productive Participation Through Exploration. In *Proceedings of the First African Conference on Human Computer Interaction* (*AfriCHI'16*). Association for Computing Machinery, New York, NY, USA, 58–68. DOI:https://doi.org/10.1145/2998581.2998589
4. Fiona Ssozi-Mugarura, Edwin Blake & Ulrike Rivett (2017) Codesigning with communities to support rural water management in Uganda, CoDesign, 13:2, 110-126, DOI: 10.1080/15710882.2017.1310904
5. Christine W. Mburu, Chelsea-Joy Wardle, Yaseen Joolay, Melissa Densmore Co-designing with mothers and neonatal unit staff: Use Of Technology To Support Mothers Of Preterm Infants. Proceedings of the Second African Conference for Human Computer Interaction on Thriving Communities - AfriCHI '18, 1-10. https://dl.acm.org/doi/10.1145/3283458.3283487

Participatory Action Research
6. Maggie Walter. 2009. Participatory Action Research. In Social Science Methods. Falmer Pr., London, UK, 1–8.
7. Sussane Bodker (1996) Creating Conditions for Participation: Conflicts and Resources in Systems Development, Human–Computer Interaction, 11:3, 215-236, DOI: 10.1207/s15327051hci1103_2
8. Gary Marsden. 2008. Toward Empowered Design. Computer41, 6: 42–46. http://doi.org/10.1109/MC.2008.207
9. DEARDEN, Andy and RIZVI, H. (2008). Participatory design and participatory development: a comparative review. In: PDC'08: Experiences and Challenges,

Participatory Design Conference, Indiana University, Bloomington, Indiana, USA, October 1-4, 2008.

10. Divya Ramachandran, Matthew Kam, Jane Chiu, John Canny, and James F. Frankel. 2007. Social dynamics of early stage co-design in developing regions. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '07*). Association for Computing Machinery, New York, NY, USA, 1087–1096. DOI:https://doi.org/10.1145/1240624.1240790

11. Melissa Densmore. 2012. Claim mobile: when to fail a technology. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '12*). Association for Computing Machinery, New York, NY, USA, 1833–1842. DOI:https://doi.org/10.1145/2207676.2208319

Participatory Design

12. Foad Hamidi, Patrick Mbullo, Deurence Onyango, Michaela Hynie, Susan McGrath, and Melanie Baljko. 2018. Participatory design of DIY digital assistive technology in Western Kenya. In *Proceedings of the Second African Conference for Human Computer Interaction: Thriving Communities* (*AfriCHI '18*). Association for Computing Machinery, New York, NY, USA, Article 8, 1–11. DOI:https://doi.org/10.1145/3283458.3283478

13. Hilary Hutchinson, Wendy Mackay, Bo Westerlund, Benjamin B. Bederson, Allison Druin, Catherine Plaisant, Michel Beaudouin-Lafon, Stéphane Conversy, Helen Evans, Heiko Hansen, Nicolas Roussel, and Björn Eiderbäck. 2003. Technology probes: inspiring design for and with families. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '03*). Association for Computing Machinery, New York, NY, USA, 17–24. DOI:https://doi.org/10.1145/642611.642616

14. Janis Lena Meissner, John Vines, Janice McLaughlin, Thomas Nappey, Jekaterina Maksimova, and Peter Wright. 2017. Do-It-Yourself Empowerment as Experienced by Novice Makers with Disabilities. In *Proceedings of the 2017 Conference on Designing Interactive Systems* (*DIS '17*). Association for Computing Machinery, New York, NY, USA, 1053–1065. DOI:https://doi.org/10.1145/3064663.3064674

15. Heike Winschiers-Theophilus, Shilumbe Chivuno-Kuria, Gereon Koch Kapuire, Nicola J. Bidwell, and Edwin Blake. 2010. Being participated: a community approach. In *Proceedings of the 11th Biennial Participatory Design Conference* (*PDC '10*). Association for Computing Machinery, New York, NY, USA, 1–10. DOI:https://doi.org/10.1145/1900441.1900443

16. S. K. Puri, Elaine Byrne, Jose Leopoldo Nhampossa, and Zubeeda B. Quraishi. 2004. Contextuality of participation in IS design: a developing country perspective. In *Proceedings of the eighth conference on Participatory design: Artful integration: interweaving media, materials and practices - Volume 1* (*PDC 04*). Association for Computing Machinery, New York, NY, USA, 42–52. DOI:https://doi.org/10.1145/1011870.1011876

17. Winschiers, H. The challenges of participatory design in an intercultural context: Designing for Usability in Namibia,Proc. PDC 2006.

18. Bass, B. M., and Shackleton, V. J. (1979) "Industrial Democracy and Participative Management: A case for Synthesis," The Academy of Management Review, July, pp. 393-404.
19. Tacchi, Jo A. and Watkins, Jerry J. (2007) 'Participatory Research and Creative Engagement with ICTs'. In Proceedings ACM Sensys 2007 workshop "Sensing on Everyday Mobile Phones in Support of Participatory Research", the Sensys Conference Hotel, the Swissotel Sydney.
20. Seabrook, M. (1991). Projects with People: The Practice of Participation in Rural Development, ed. P. Oakley, xv 284 pp. Geneva: International Labour Office (1991). £14.30 (paperback). Available from ILO, Vincent Square, London SW1P 2NB. ISBN 92 2 107282 7. *The Journal of Agricultural Science, 117*(3), 385-385. doi:10.1017/S0021859600067150
21. Heeks, Richard. (1999). The Tyranny of Participation in Information Systems: Learning from Development Projects. 10.13140/RG.2.2.32095.61604.
22. Dearden, Andy & Rizvi, Syed. (2008). Participatory IT Design and Participatory Development: A comparative review. Proc. PDC'08. 81-91. 10.1145/1795234.1795246.
23. Mbiti, J. African Religions and Philosophy. (2nd ed). Heinemann (First edition 1969). 1990.
24. Kevin Walker, Joshua Underwood, Tim Waema, Lynne Dunckley, José Abdelnour-Nocera, Rosemary Luckin, Cecilia Oyugi, and Souleymane Camara. 2008. A resource kit for participatory socio-technical design in rural kenya. In *CHI '08 Extended Abstracts on Human Factors in Computing Systems* (*CHI EA '08*). Association for Computing Machinery, New York, NY, USA, 2709–2714. DOI:https://doi.org/10.1145/1358628.1358749
25. Elaine Byrne & Sundeep Sahay (2007) Participatory design for social development: A South African case study on community-based health information systems, Information Technology for Development, 13:1, 71-94, DOI: 10.1002/itdj.20052
26. Sherwani, J. & Ali, Nosheen & Rosé, C.P. & Rosenfeld, R.. (2009). Orality-grounded HCID: Understanding the oral user. Information Technologies & International Development. 5. 37-49.

Gender-Inclusive Design
27. Oxfam: Quick Guide to Gender Analysis https://oxfamilibrary.openrepository.com/bitstream/handle/10546/312432/ml-quick-guide-to-gender-analysis-300114-en.pdf;jsessionid=226B9AD9467965C80BF8EB7D8519B714?sequence=1
28. Tebaldi Raquel, Gender and social protection in sub-Saharan Africa: a general assessment of programme design, International Policy Centre for Inclusive Growth (IPC-IG) November 2016 https://ipcig.org/pub/eng/PRB58_Gender_and_social_protection_in_sub_Saharan_Africa.pdf
29. Molyneux, Maxine. 1985. "Mobilization without Emancipation? Women's Interests, the State, and Revolution in Nicaragua." Feminist Studies 11 (2): 227–254.

30. Agarwal, B. (2000). Conceptualising environmental collective action: Why gender matters. Cambridge Journal of Economics, 24(3), 283–310. http://doi.org/10.1093/cje/24.3.283
31. Rebekah Cancino and Shaina Rozen The habits of leading women in digital design https://www.aiga.org/open-letter-to-women-in-digital-design
32. Tanita Wensky: Graphic Design: Where are all the women? https://www.pixartprinting.co.uk/blog/graphic-design-women/

33. Susan M. Dray, Anicia N. Peters, Anke M. Brock, Andrea Peer, Allison Druin, Shikoh Gitau, Janaki Kumar, and Dianne Murray. 2013. Leveraging the progress of women in the HCI field to address the diversity chasm. In CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13). Association for Computing Machinery, New York, NY, USA, 2399–2406. DOI:https://doi.org/10.1145/2468356.2468785
34. Inclusivity Disrupts Design https://uxplanet.org/inclusive-design-in-digital-world-de50dbf98d62
35. Mihaela Vorvoreanu, Lingyi Zhang, Yun-Han Huang, Claudia Hilderbrand, Zoe Steine-Hanson, and Margaret Burnett. 2019. From Gender Biases to Gender-Inclusive Design: An Empirical Investigation. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 53, 1–14. DOI:https://doi.org/10.1145/3290605.3300283
36. Tigist Shewarega Hussen, Nicola J. Bidwell, Carlos Rey-Moreno, and William D. Tucker. 2016. Gender and Participation: Critical Reflection on Zenzeleni Networks in Mankosi, South Africa. In *Proceedings of the First African Conference on Human Computer Interaction* (*AfriCHI'16*). Association for Computing Machinery, New York, NY, USA, 12–23. DOI:https://doi.org/10.1145/2998581.2998584
37. Ineke Buskens. 2014. Developing the capacity for gender awareness in development research: Some thoughts and suggestions –A think piece for the IDRC's Information and Networks Team, IDRC: Ottawa.
38. Ari Schlesinger, W. Keith Edwards, Rebecca E. Grinter Intersectional HCI: Engaging Identity through Gender, Race, and Class. Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, ACM, 5412-5427 https://dl.acm.org/doi/pdf/10.1145/3025453.3025766
39. Logan D. A. Williams & Georgia H. Artzberger (2019) Developing women as ICT users: a miniature scoping review of gender and ICTs for development, Gender, Technology and Development, 23:3, 234-256, DOI: 10.1080/09718524.2019.1679330 https://doi.org/10.1080/09718524.2019.1679330
40. Starks, Dillahunt, and Haimson, "Designing Technology to Support Safety for Transgender Women & Non-Binary People of Color." https://dl.acm.org/doi/10.1145/3301019.3323898
41. Lessig, L. (2006). Code: And other laws of cyberspace, version 2.0 (2nd revised ed.). New York: Basic Books.
42. Tufekci, Z. (2016). As the pirates become CEOs: The closing of the open internet. Daedalus, 145, 65–78. doi:10.1162/DAED_a_00366

43. Dourish, Paul & Bell, Genevieve. (2011). Divining A Digital Future: Mess and Mythology in Ubiquitous Computing.
44. Brayton, J. 1997. What makes feminist research feminist? The Structure of Feminist Research within the Social Sciences.
45. Marika Cifor and Patricia Garcia. 2020. Gendered by Design: A Duoethnographic Study of Personal Fitness Tracking Systems. *Trans. Soc. Comput.* 2, 4, Article 15 (January 2020), 22 pages. DOI:https://doi.org/10.1145/3364685
46. Oxfam: Guide to Feminist Influencing https://oi-files-d8-prod.s3.eu-west-2.amazonaws.com/s3fs-public/file_attachments/oxfams_guide_to_feminist_influencing_english.pdf
47. Cui, K. (2015). The insider–outsider role of a Chinese researcher doing fieldwork in China: The implications of cultural context. Qualitative Social Work, 14(3), 356-369
48. Chammas, G. (2020). The Insider-Researcher Status: A Challenge for Social Work Practice Research. The Qualitative Report, 25(2), 537-552. Retrieved from https://nsuworks.nova.edu/tqr/vol25/iss2/16
49. Steyn, Jacques & Van Belle, Jean-Paul & Mansilla, E.V.. (2010). ICTs for Global Development and Sustainability: Practice and Applications. 10.4018/978-1-61520-997-2.
50. Ida Christine Opsahl, Julie Nyjordet Rossvoll and Nora Pincus Gjertsen. (2019). Service design to improve women's maternal healthcare services in Nepal
51. UN Women - Gender Mainstreaming Extract from REPORT OF THE ECONOMIC AND SOCIAL COUNCIL FOR 1997 https://www.un.org/womenwatch/daw/csw/GMS.PDF
52. Brouwers, R. (2013) 'Revisiting gender mainstreaming in international development: goodbye to an illusionary strategy' http://repub.eur.nl/res/pub/39504/wp556.pdf
53. Buskens Ineke, Webb Anne. WOMEN AND ICT IN AFRICA AND THE MIDDLE EAST: changing selves, changing societies
54. Swiebel Joke. (1999), Unpaid work and Policy-Making, "Discussion Paper of the United Nations Department of Economic and Social Affairs."
55. Agarwal, Bina. (2001). Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. World Development. 29. 1623-1648. 10.1016/S0305-750X(01)00066-3.
56. Gurumurthy, Anita. (2004). Gender and ICTs: Overview Report. Institute of Development Studies.
57. Rey-Moreno, Carlos & Tucker, William & Bidwell, Nicola & Roro, & Siya, & Simó-Reigadas,. (2013). Experiences, Challenges and Lessons from Rolling Out a Rural WiFi Mesh Network. Proceedings of the 3rd ACM Symposium on Computing for Development, DEV 2013. 10.1145/2442882.2442897.
58. Phakeng M. Leadership: The invisibility of African women and the masculinity of power. S Afr J Sci. 2015; 111(11/12), Art. #A0126, 2 Pages. http://dx.doi.org/10.17159/sajs.2015/a0126
59. Hassim Shireen Feature Article: Terms of Engagement: South African challenges [1] http://www.agi.ac.za/sites/default/files/image_tool/images/429/feminist_africa_journals/archive/04/fa_4_feature_article.pdf
60. Ineke Buskens: African Women and ICTs

Chapter 4, Section 15

61. Goble, C.E.. (2002). The Internet – an elitist luxury or the people's necessity?. South African Journal of Information Management. 4. 10.4102/sajim.v4i3.181.