

Women's Use of Participatory Video Technology to Tackle Gender Inequality in Zambia's ICT Sector

Abstract

This paper contributes a case study of Asikana Network, a Zambian women's organisation that uses ICT4D to tackle the profound gender inequality experienced by women in the country's emerging ICT sector. The particular focus of this case study is the use by Asikana members of participatory video. Using the theoretical lens of the capabilities approach and critical feminist pedagogy, and a participatory action research approach, the paper presents evidence that the technology of participatory video has particular affordances that can enhance people's critical-agency to determine their own development. Here 'critical-agency' refers to people's critical understanding of the disadvantage that they experience, as well as their agency in acting to overcome it. Findings suggest that, whilst the technology of participatory video has affordances that can enhance critical-agency for development, these outcomes are not technologically determined and rely on particular human capacity and intent. Recommendations are made for a critical theory and practice of ICT4D that enables disadvantaged people to make use of ICTs to improve their understanding of the structural root-causes of the inequality that they experience, in ways that inform their critical agency to transform it.

1. Introduction

Zambian women and girls face systematic discrimination and disadvantage in the home, school, and workplace in ways that severely constrain their freedom to engage in Zambia's ICT sector on an equal basis with men. Zambian girls are half as likely to complete secondary education as boys [1]. Early withdrawal from education is often a result of early pregnancy and marriage [2] or due to girls being required to undertake domestic chores that have been socially constructed as women's work [3]. Zambian girls are under-represented as graduates in the 'STEM' subjects of science, technology, engineering and maths, which have been gendered as 'male' [4]. Gender disadvantage in educational attainment translates into under-representation in technology workplaces [5]. Zambian women are under-represented in information and communication technology roles generally [6]. Gender discrimination in the workplace means that women are especially under-represented in senior positions [7]. The under-representation of women in Zambia's ICT sector is a particular cause for concern as information and communications technologies are fast becoming central to many key aspects of modern life [8].

It would be possible to be overwhelmed by this situation, or to think that as individual women they are unable to change it, but the women of Asikana Network are not passive victims. Asikana Network is an independent non-profit organisation, based in the Zambian capital city of Lusaka, that aims to empower women in the field of technology. It was formed by women to tackle the profound gender discrimination and disadvantage that they experienced in Zambia's male-dominated technology sector. Asikana's active membership is composed of more than one hundred women, mainly aged between 18 and 23, drawn from a range of socio-economic backgrounds, living in urban and peri-urban settings in and around Lusaka. Asikana members self-organise themselves in a range of activities to provide support, training and networking events for women entering the ICT sector. Asikana specialises in the use of information and communication technologies for development (ICT4D). Asikana's ICT4D activities include providing technical and vocational training in basic computing skills as well as courses for building web and mobile phone applications. Asikana also provides mentoring, promotes role models of successful women in technology, and organises events to build an effective support network for women in ICT. In 2012 they built a women's rights app for mobile phones that was adopted by Facebook and widely disseminated. Asikana principles include gender equality, equal access to the use of technology, and participatory approaches in the application of ICT4D.

This research involved members of Asikana network in a participatory action research process in which members used a critical participatory video process to investigate the root causes of the gender (dis)advantage that they experienced in the sector. Asikana members interviewed other women about their experiences and analysed the film data in critical dialogue sessions in which they co-produced knowledge about how unequal gender relations are reproduced in Zambia's ICT sector, and developed their sense of

self-efficacy and agency to challenge gender injustice. Participants produced a series of short films in which they express their dissent, critique, and intent for change. These films represent counter narratives to mainstream media in Zambia in which the ICT sector is represented as a male domain.

2. Literature Review

Influential reviews of the research field of ICT4D have identified a general failure to define the kind of development that ICT4D is intent upon, as well as the relationship between ICT and development [9, 10, 11]. In defining the kind of development that this research is intent upon, this paper draws upon Amartya Sen's capability approach and critical theories but additionally argues that insights from critical theory - specifically critical feminisms and critical pedagogy - are necessary if ICT4D is to be able to adequately critique and challenge the deep-seated power structures that often determine (under)development [12, 13].

2.1 Development as Freedom

There have been various approaches to development, which have evaluated it in terms of outcomes such as utilities, welfare, happiness, and, most commonly, income [14]. Sen [15] has argued that a comprehensive evaluation of development should consider other aspects of a person's well-being which they may have reason to value, such as access to education, healthcare, and political freedoms. In addition, in his book, *Development as Freedom*, Sen [16] argues that people also have reason to value active participation in the process of development and not only being recipients of its "culmination outcomes". Emphasising this point about participation in the process of development, Sen [17] argues that individuals have reason to value their own agency to set development priorities and to actively pursue them, rather than being considered "primarily as the passive recipients of benefits of cunning development projects". Agency is defined here as a person's ability to act in pursuance of their own goals and values [18]. Sen [19] defines development as "a process of expanding the real freedoms that people enjoy", as well as "the removal of major sources of unfreedom". This research is grounded in such an agency-based concept of 'development as freedom', and uses it as a lens through which to assess the ability of the women of Asikana Network to use participatory video-making to extend the capabilities and freedoms of women in Zambia's ICT sector and to address sources of unfreedom that constrain their development.

2.2 Critical-Agency

Not all agency is good agency. To illustrate this point Dreze and Sen [20] use the example of 'son preference'. In China and India the cultural practice of son preference, in which women and men selectively abort a female foetus, or allow newborn girls to die, is responsible for millions of 'missing women' [21]. In such situations where women's agency is one of the elements in (re)producing gender inequality, increasing women's agency may actually increase the problem. In these circumstances Dreze and Sen argue that critical-agency is required, where critical-agency is the ability to critically question, and where necessary reject, dominant gender norms and values. This perspective is important to this research as evidence of women's role in (re)producing unequal gender relations was also found in Zambia. To address this uncritical (re)production of unequal gender relations Dreze and Sen argue that critical-agency is "important in combating inequalities of every kind" [22], and that it is 'pivotal' to development [23]. If this logic is accepted, it then becomes difficult to imagine circumstances in which uncritical agency would be preferable to critical-agency. I argue that, if we take seriously Sen's claims about the importance of critical-agency in development and combatting inequality, then ICT4D initiatives should aim to enhance critical-agency. In this study also, research participants identified ways in which women's agency contributed to negatively adapting girls' preferences for ICT careers and where critical-agency was necessary to address gender inequality.

2.3 Critical-Pedagogy

Despite identifying the importance of critical-agency Sen provides no guidance about how critical-agency might be generated in practice or incorporated into development initiatives. Critical pedagogy and critical feminisms are advantageous in this regard. In his most read book, *Pedagogy of the Oppressed* [24], Paulo Freire elaborated a process of 'conscientisation' that was designed specifically to enhance people's critical

consciousness and agency, to enable them to critique their social arrangements and use their agency to generate social change. Later scholars of critical pedagogy [25, 26] used the compound term ‘critical-agency’ to capture this ability to read the world critically and to act as agents in order to transform it. Freire’s critical method was widely adopted in community development [27] and in international development [28] and has been operationalised by over five hundred agencies in their field projects [29, 30] including in ICT4D [31, 32]. This experience provides a rich body of practice and theory to guide ICT4D practitioners who wish to enhance the critical-agency of disadvantaged people to themselves identify and overcome the circumstances that disadvantage them. This research drew upon this tradition to inform the design of a critical participatory video process, used to enhance the critical-agency of Asikana Network members to tackle the gender discrimination that they experience.

The ability to critically question and to challenge dominant norms and social inequality is particularly valuable where the aim is to tackle the root causes of the problem and not just its symptoms. In engineering and management studies ‘root cause analysis’ makes a clear distinction between causes and root causes, in which only the removal of a root cause guarantees non-recurrence of the problem [33]. Where the objectives of ICT4D initiatives include non-recurrence of inequality, then identification of, and action to tackle, its root causes are likely to be priorities. The excavation of root causes of social inequality regularly involves confronting what Zheng and Walsham [34] call the “deep-seated issues of political and institutional arrangements” that regularly underpin other inequalities. Sen’s capability approach lacks a critical analysis of these structural power interests [35, 36] however critical theory insists upon it [37]. This paper therefore draws additionally on critical theories as a guide for development action that enables people to self-identify the structural root causes of the disadvantage that they experience, and increase their critical-agency to overcome it.

2.4 Critical-Feminisms

Critical feminisms are a rich source of practical experience and theoretical guidance about enhancing critical-agency. Like Freire’s process of conscientisation, feminist consciousness-raising workshops have been productive in stimulating group dialogue in which women can collectively analyse their experience of disadvantage and unearth its root causes [38, 39, 40]. According to Molyneux [41] this group work of translating women’s practical experience of discrimination into consciousness of their strategic gender interests, constitutes the central aspect of feminist practice.

According to Molyneux, practical gender interests are those concerned with women’s immediate practical needs, for example access to employment, childcare and equal pay. Strategic gender interests are aimed at ending men’s power and control over women, including male violence to women, the unequal divisions of domestic and workplace labour, and securing gender equality. Molyneux [42] makes the point that, in order to struggle effectively for their strategic gender interests, a higher level of feminist consciousness is necessary about the deep-rooted causes of gender inequality. This resonates with Freire’s argument that a level of critical consciousness is required to guide action to transform social disadvantage. However, other critical feminists including Longwe [43] have critiqued the binary distinction between practical and strategic, arguing that practical needs are often integral to strategic interests and that therefore development initiatives should incorporate both. Despite agreeing with Longwe, I still find Molyneux’s distinction between the practical and strategic to have explanatory and theoretical value. Whilst women have good reason to value development activities that meet their immediate practical needs, no amount of such work can overcome male-domination, including of Zambia’s ICT sector. There remains value therefore in distinguishing which activities address strategic gender interests. In her work on gender and development research, Buskens [44] builds on Molyneux’s work and makes a useful tripartite distinction between conformist, reformist and transformist research. Elsewhere I have appropriated and modified Buskens’ approach to propose a related framework for analysing ICT4D initiatives [45], which retains this conformist-reformist-transformist distinction.

From this perspective ICT4D initiatives may be considered to be ‘conformist’ if they enable women to better

cope with existing unequal gender relations, without challenging or changing them. Initiatives can be considered to be 'reformist' if they challenge or change unequal social relations, but do so without challenging or changing the structural power relationships that give rise to and (re)produce those relationships in the first place. ICT4D initiatives that are intent on challenging or changing the structural power relationships that are the root causes of gender inequality are termed 'transformist'. Women have reason to value conformist and reformist initiatives that address their practical needs; however we can also recognise that meeting them does not address or resolve the underlying causes. Molyneux [46] claimed that practical interests are often symptomatic of deeper-seated strategic-structural issues of power and control, and therefore it is the latter, which must ultimately be rooted out in order to achieve any fundamental or lasting change, she says:

“these practical interests do not in themselves challenge the prevailing forms of gender subordination, even though they arise directly out of them.”

The categorical distinctions between practical and strategic, and those between conformist, reformist and transformist can be justifiably critiqued as crude simplifications of what is a far more complex social reality. In practice the categories are porous and interconnected, but it is argued here that the admission that such categories can be usefully deconstructed does not diminish their explanatory or theoretical value. Kate Young's [47] concept of 'transformatory potential' provides an additional means of assessing the extent to which gender and development initiatives effectively address the root causes of unequal gender relations. The method that she proposed was to ask whether methods:

“allow the interrogation of practical needs (by women themselves) to see how they can become or transform themselves into strategic concerns. In other words have they the capacity for questioning, undermining or transforming gender relations and the structures of subordination”.

Young's description is particularly apt for this research as it speaks directly to the two core elements of critical-agency: the critical questioning, and the action for transformation. This paper assesses the 'transformatory potential' of Asikana's use of participatory video to interrogate their members' practical experience of discrimination and to enhance their critical-agency for development. Central to that assessment will be an examination of the particular affordances of the technology of participatory video for that task. The next two sections introduce the concept of affordance and the technology of participatory video.

2.5 Affordances

Originated by psychologist James Gibson [48] to refer to the actionable properties of an item, the term 'affordance' was first appropriated for the field of technology design by Donald Norman [49] and is used to signify those aspects of a technology that invite, allow or enable a user to act in a particular way. For example, it has been argued that the audio-visual nature of video affords (invites and enables) participants of all print-literacy levels to collaborate in processes of knowledge formation and dissemination [50, 51, 52]. It has also been claimed, for example, that participatory video invites group deliberation [53], allows social learning [54], and that the rewind and reply functions of video technology enable reflexivity [55, 56]. This paper argues that participatory video has particular affordances for enhancing critical-agency and includes new findings about these particular affordances.

2.6 Participatory Video

The term 'participatory video' has no commonly agreed definition [57]. It has been used to describe a range of quite distinct practices, and some uses of video that closely resemble participatory video are not described

as such [58]. It is broadly-speaking a process of involving people without prior video-making experience in making videos about issues of importance to them, from their own perspective, often initiating a process of analysis and change [59]. One definition of participatory video, developed collectively by the practitioners of PV-NET [2008] is:

“a collaborative approach to working with a group or community in shaping and creating their own video, in order to open spaces for learning and communication and to enable positive change and transformation”.

Unlike other kinds of video-making, participatory video involves handing over control of the video-making process to inexperienced users in order to enable them to investigate issues affecting their lives, and to voice their conclusions in their own words and images [60]. Shaw and Robertson [61] characterise participatory video as “a process of media production to empower people with the confidence, skills and information they need to tackle their own issues”. In the last twenty five years participatory video has become a popular element of development initiatives due to claims that, among other things, the process can benefit participants' self-esteem, enhance people's agency, and serve as an effective mechanism to amplify the power of disadvantaged groups to influence or effect social change [62]. In recent years writing about participatory video has generally become less celebratory and more critical, questioning, among other things, the extent to which control is handed over, and scrutinising claims that participatory video generates social change [63, 64, 65].

Freire's [66] critical method forms part of the theoretical framework for much participatory video in many of its foundational texts [67, 68, 69, 70]. Participatory video has also been claimed as a feminist research method [71] which can ground research in women's experience through a practice of listening to women's voices [72], foregrounding their narratives in ways that counter the dominance of male voices in traditional social research [73]. This research combined women's video-making with critical dialogue workshops to create a space for the women of Asikana Network to critically reflect and deliberate upon their practical experience of gender disadvantage, and to excavate its root causes. Their videos produced data and stimulated critical analysis amongst participants about what factors limited or enabled their freedom and agency.

The participatory video process designed for this research aimed to address both the practical needs and strategic interests of the women of Asikana Network. Firstly, the workshops aimed to increase women's practical and vocational abilities in digital video-production, communication skills, and self-efficacy. Secondly, the workshops intended to enhance women's critical-agency to identify, analyse and tackle what Kabeer (74) calls “the dense root-structure of gender injustices experienced in [women's] daily lives”. The next section details the research design used to operationalise this research intent.

3. Methodology

The research adopted a participatory action research approach employing mixed qualitative methods: a participatory video process that incorporated participatory workshops, complemented by focus groups and semi-structured interviews. Video-making was used by members of Asikana Network to collect and to critically analyse data of women and men's experience of gender issues in Zambia's ICT sector.

3.1 Selection & Sampling

This research took place over the course of four trips to Zambia between December 2011 and August 2013. Video-makers were drawn exclusively from Asikana Network's membership. The invitation to take part in the workshops was extended to all Asikana Network members, and all women that applied were enrolled. No stipends, travel or lunch costs were provided, as this was consistent with Asikana policy for all of its training

and events. Twenty-one Asikana members took part in the participatory video process in five groups of between 3 and 6 participants and took between 5 and 7 days to complete.

On the first day participants formed four small groups, each with its own camera and tripod, and learnt basic camera functions by filming each other saying who they were and how they discovered Asikana Network. Each group then filmed and edited its own video composed of interviews with three other Asikana members answering questions about whether women were equally represented in the ICT sector, what factors might explain that situation, and how the existing situation might be improved. They edited their own films and added soundtracks and titles. Each film was only one minute in length as the methodology emphasised process over product. The research intent was to generate critical-agency and not to produce broadcast quality videos. At the end of day one women screened their films to each other and discussed the gender issues arising from the data. They then selected one of these films as the subject of the day two video-making assignment (a longer two-minute film). Repeating this process each day provided a mechanism to each day to dig deeper into their organisation's core subject of gender injustice in the ICT sector. Multiple iterations of video-making were used as an epistemological means for participants to excavate deeper and to critically analyse the root causes of the gender inequality that they experienced. Each day new technical skills were introduced but with a strong emphasis on experiential learning over classroom teaching. At the end of each day group video-screenings provided an opportunity for critical dialogue about gender injustice, and the subjects they wanted to explore with future films or by means of other Asikana activities. I facilitated the first workshop alongside a Zambian woman co-facilitator who I had worked with previously. Two members of the first Asikana workshop became co-facilitators of the later Asikana workshops.

Semi-structured interviews were conducted with all 21 video-makers as well as with 7 other Asikana members who did not themselves make videos but who were either Asikana leaders or who featured in videos. Semi structured interviews were also conducted with 15 men who were interviewed in Asikana videos about their views on women in technology. A smaller rural workshop, involving 15 participants, also took place but is not covered in this paper. This made the total number of unique interviewees 58. As most key participants were interviewed twice, the total number of interviews was 86. Data from these interviews was triangulated with data from focus groups and videos. In addition to the 36 video transcripts and 86 interview transcripts, 48 field notes and 3 focus groups were transcribed and entered into qualitative data software for later coding and analysis.

3.2 Problem-Posing Method

The under-representation of women in Zambia's ICT sector was chosen as the core subject matter for video making as this was the founding reason for the establishment of Asikana Network. At the end of each day the groups screened their videos to each other and collectively analysed their own videos, both technically in terms of videoing and editing techniques, and with regard to the gender and development themes that emerged. To deepen participant's investigation, a process of critical dialogue with participants was facilitated using Freire's [75] problem-posing methodology. The objective of this process was to problematise participants' experience and guide them to a more critical investigation of the social and cultural factors determining their experience of (dis)advantage as well as to realise their agency to change the situation. The themes that emerged from these daily discussions were used to develop the videoing assignment for the next day. Each cycle of video-making collected new research data and the subsequent critical dialogue workshops involved the women in a progressively deeper critical analysis of the gender inequality that they experienced.

The rapid iteration of video-making cycles and use of participatory video technology as a means of achieving successively deeper levels of critical investigation into structural root causes represents a deviation from standard participatory video process, which typically involves all group members in the collective production of a single video over the course of a week or more [76, 77, 78]. Appropriating participatory video in this way was intended to enable Asikana members to enhance their critical-agency, that is both their critical understanding of the root-causes of the inequality that they experienced, as well as their agency to act and change the situation.

Enrolling women as co-researchers who had control over the subject matter, who to interview, and what questions to ask, helped to avoid 'extractive' research in which the data is owned by and designed to benefit the foreign researcher [79] or is written up solely for the literature [80]. Participatory video has the affordance of allowing and enabling novices to have direct involvement in the process of data collection, knowledge production and analysis [81, 82]. Asikana members were able to make a series of short videos investigating subjects that were priorities for them, and to publish them on their own YouTube channel.

In the subsequent semi-structured interviews and focus groups, women reported new technical skills as well as new critical understanding about the situation of women in Zambia's ICT sector. Participants were also able to attribute some of their new knowledge and sense of agency to particular affordances of the technology of participatory video. The next section elaborates the process of data analysis before the findings are presented in Section 4.

3.3 Data Analysis

Data was analysed using a combination of open and theoretical coding involving inductive and deductive processes. Open codes were generated from field data, whilst theoretical codes were generated from interpreting the existing literature [83]. The use of qualitative data analysis software enabled rapid navigation, manipulation and retrieval of data. In a first pass of analysis, salient data was assigned open codes. In a second round of data analysis codes were clustered into themes, and in subsequent rounds those themes were iteratively refined and modified [84]. Each round required returning to the initial data for closer re-reading and analysis. The inductive process of moving from data to open codes, themes and concepts, raised new conceptual and theoretical issues that stimulated an inverse process of reviewing the existing academic theory, generating and refining theoretical codes and relating them deductively to emerging data codes and themes [85]. This iterative process of coding and analysis, filtered via the research aims, enabled discernment of the patterns, relationships and concepts that gradually emerged and gave rise to the themes that shape the narrative of this research [86].

4. Findings

The research findings are presented in three sections below. In the first section the perceived constraints on the freedom of women in Zambia's ICT sector are presented. The second section organises women's attribution of the causes of those felt constraints and the institutional means by which unequal gender norms are (re)produced in Zambia. In the third section those factors perceived to be the structural root causes of women's disadvantage from the standpoint of the women participants are presented.

4.1 Constraints On Freedom

On the first day video-makers interviewed other Asikana members about their experience of accessing ICT education and employment in Zambia's ICT sector. Women interviewees were asked questions including "Are women equally represented in the technology sector in Zambia?", "Why do you think that is?", and "What could be done to improve the situation?" By this means research participants were able to identify a range of constraints experienced by women in Zambia's technology sector. Constraints identified included pervasive social myths about male superiority in science, technology, engineering and maths (STEM), as one video-maker, Constance, reported:

"I was told, point blank, 'You can't do this, you can't go and do accounts', and it was someone from my family who said, "No, you can't go and do accounts because calculations are just usually for men and ... it's going to be very challenging and you'll end up failing".

Women and men interviewed had internalised these values and social norms to varying extents, with negative effects on women's self-esteem. Asymmetric restrictions on women's free time also featured strongly as a gendered constraint on freedom. The women and men interviewed reported that women and girls in Zambia bear an unequal burden of responsibility for housekeeping, cooking and childcare. Asikana member, Susan, explained how this domestic division of labour constrained her opportunity for self-development in relation to her brother:

“For women, we have to really wash the dishes, do all the chores at home, before you even leave, and sometimes those things are quite too much, so that you're not even given an opportunity to go out and learn something”.

The video content, subsequent interviews and focus groups all provided data that Zambian women are socialised to perform deference to men in ways that constrain their development. In one video Freida says:

“The biggest problem we are facing in Zambia is [that women] don't have a voice. They don't talk on their problems. They think it is tradition that they have to live like that ... Somehow we heard from our parents that you do not actually voice out in front of men. We are told not to”.

The participatory video process afforded women with a reason and a means to collect a body of data about a subject of concern to them and provided them with a safe space in which to openly discuss the problems that they face. Most participants reported that this was the first opportunity that they had to freely discuss their experience of gender discrimination in a group of like-minded people. Other Asikana activities that they had participated in focused on technical training and vocational mentoring. Participants valued discovering that they were not alone in their experience and that other women's aspirations to pursue a preference for ICT were also systematically discouraged and obstructed. Women participants felt strongly that they benefited from learning other women's perspectives and being able to disseminate them by means of the video-making.

In the follow-up interviews and focus groups, research participants reported that the participatory video process not only increased their technical skills in filming and editing but also enhanced their knowledge about their situation, improved their ability to voice their knowledge, and increased their sense of self-efficacy. Research participant, Lesley, commented:

“I have learned more about women, I have learned more about videography, and I have gained in confidence and motivation”.

Such results must of course be interpreted in light of potential bias caused by 'social desirability' and the approval motive [87] however questions were carefully worded and methods triangulated. Most research participants were able to attribute these gains to particular affordances of the participatory video process. For many participants, being asked on camera their view on issues that they felt strongly about represented a significant valuing of their opinion and increased their self-esteem. One participant, Hannah, reported that she valued:

“Being in front of the camera and getting to talk about the issues that we talked

about openly, it got me thinking and helped me to build my self-confidence”.

The technology's affordances of rewind, replay and re-edit allowed participants the ability to see and to hear themselves speaking on a big screen about the issues that concerned them most. The technology afforded them the ability to rehearse, revise and re-shoot their voicing of issues until they were satisfied. For participants like Hannah, seeing themselves projected on the screen speaking authoritatively on issues of import, 'got her thinking' and increased her sense of self-efficacy. They were also able to share these videos online, projecting their performances to distant friends and relatives. This new perspective on one's own ability to act in the world in pursuit of valued change is an affordance of participatory video which is echoed elsewhere in the literature. These findings are also supported by other research; High [88] identifies the affordance of participatory video for group deliberation and social learning. Shaw and Robertson [89] have illustrated the affordance of participatory video as a means to identify and to voice issues of importance to a group, and White [90] has shown how participatory video affords groups an opportunity to reflect on social issues and voice their opinion. Elsewhere I have elaborated how some participatory video outcomes are attributable to affordances of the technological artefact itself whilst others are attributable to affordances of the process [91]. Further exploration of this duality would be a promising area for future research.

4.2 Causes of Constraints

In the second round of video-making participants were encouraged to make videos that excavated deeper to locate the causes of the various constraints identified in the first round. Video-makers asked questions such as “Why do these constraints exist?”, “Where do those gender norms and values come from?”, and “Why hasn't change already happened?” In responding to these questions, research participants reported identifying a range of institutional mechanisms, including family, cultural practices, education, and religion, through which dominant gender norms are (re)produced and socially constructed.

Research participants identified the family as a significant institution in the socialising of Zambian girls and boys into prescribed gendered roles. Constance was a young participant with a brother who was exempt from household chores and she commented:

“Being in the kitchen is just not for men ...[Chores] around in the house usually is for women. He's not being asked to do anything because he is a guy, and I have to do everything. Really makes me feel bad ... I feel like I'm being abused or something like that, but then ... you've grown up like that, being told that, you'll find yourself accepting the situation because it's expected of you”.

Constance's example is typical of how many women, subject to unequal, pervasive gender norms, adapt their own preference for equal treatment and opportunities in order to conform to socially-constructed gender roles that do not serve their interests. Constance's experience also illustrates how a girl's own family is often a key institutional means by which gender norms and constraints are (re)produced.

Another research participant, Alma, explained how marriage initiation practices in Zambia teach women subservience. Marriage initiation takes different forms in different communities in Zambia, however one common element is that during these women-only events the bride-to-be is secluded with women elders who teach her to perform deference and submission to men [92, 93, 94].

“It's because of what they've been taught ... the elders, the grandmothers ... before they get married ... you go to that woman, you stay there for some days,

and they'll be teaching you those things”.

The central role of women in (re)producing gender inequality recalls Amartya Sen's [95] example of 'son preference'. In instances where the agency of women serves to sustain unequal gender relations, he argued it would be counter-productive simply to build women's agency, as this may have the effect of further entrenching practices that (re)produce gender injustice. In such cases Dreze and Sen [96, 97] argued that critical-agency was necessary to enable women to question, and if necessary to reject, dominant gender norms.

Another institution identified by research participants as (re)producing unequal gender relations was the education system. Research participant Faith was among women who highlighted the role of education in (re)producing gender norms and values:

“When it comes to school, there are certain subjects, we say 'This subject is for guys, they'll do well in this, they'll do better than a lady would do', which I don't think is the case”.

and Faith's co-participant, Mercy added:

“They will discourage you and say [computing] is not for girls, you have to do nursing or something like teaching”.

These findings are supported by research from other countries including neighbouring Zimbabwe, where women university students were disadvantaged in access to computers [98], and by gender stereotypes (re)produced by prejudiced teaching staff [99]. Salome Omamo's [100] research traces gender stereotyping back to the school playground and then replayed as gender discrimination by employers, as do Busch [101] and UNWomen [102]. That schools and colleges contribute to the institutionalisation of gender disadvantage must be of particular concern to policy makers, as access to education is often prescribed as an important means to achieving gender equity.

Religion was also shown to play a formative role in (re)producing unequal gender relationships in Zambia. Susan was not alone in being able to refer to precise chapters and verses from the bible that were used to justify women's unequal position:

“In the bible, ... in the book of Proverbs: 31 it shows how a woman should be taking care of the family, the husband and everything, [and in] Timothy 2:11 that, women should learn quietness and full submission”.

In a country where, according to the 2010 census, 87% of the population identify themselves as Christian, the divine authority of God lends substantial weight to an already pervasive public pedagogy of women's subservient status. One participant, Alice, explained how these tools can be mobilised against women who resist male-dominance. Alice described her experience:

“If you try to be all 'we're equal, women's rights', people accuse you of being a feminist and being Westernised, and they tell you that you're being un-Zambian. ...

So it's that general mentality that ... if you are fighting you are being unwomanly, un-Zambian and un-Godly, and once the un-Godly factor is brought in it makes a lot of women not want to fight for it and to just back off completely”.

From Alice's personal experience being accused of being unwomanly, un-Zambian, and ungodly were powerful pejoratives, designed to attack core pillars of her identity. Alice was told implicitly that to be considered a woman, to be a Zambian or to be a Christian, she must submit to male authority. To suggest that the church is somehow implicated in women's oppression is not an issue that forms part of public discourse in Zambia, nor is it covered in mainstream media. The participatory video practice adopted in this research afforded participants a safe space in which to tentatively broach an otherwise taboo topic. It was not however a subject about which participants elected to produce a video, an illustration, if any was needed, that participatory video is no silver bullet.

The participatory video process did afford a space for women like Alice to partially deconstruct dominant narratives, to voice dissent about gender injustice, and to reflect upon the various institutional means through which inequality is (re)produced and sustained inter-generationally. Participants' production of videos did lead to production of knowledge. By using participatory video as a means of data collection and critical dialogue, research participants were able to co-produce a shared analysis of the social institutions that (re)produce unequal gender relations. Participatory video also gave them a technical means to construct compelling audio-visual articulations of their critique of gender inequality and of their intent to bring about change, as they did for example in the film “Coming Out of the Kitchen”.

When participants screened the second round of videos to each other, and in the subsequent focus group, discussion focused not only on the institutions (re)producing gender (dis)advantage but also on why elders, teachers and preachers hold those views in the first place. Tradition, custom and culture were the most common attributed causes for gender constraints on development. In the first focus group Alice commented:

“It's a cultural and traditional issue. People bring up their children the way that they were brought up. ... It's passed on from generation to generation that a man is supposed to be this way and a woman is supposed to be this way”.

In the second focus group Anne echoed the sentiment saying:

“It's just like an inherited culture. When you're born you find the culture. That culture has been there since those that were born a long time”.

Inherited culture was offered by participants as an immutable 'given', requiring no further explanation or critique. This acted as a potential roadblock to further critical investigation, so I suggested that one option for the next round of video-making could be to make a video about three generations of Zambian women to investigate whether culture was indeed unchanging. One of the three groups developed this suggestion. They devised questions and interviewed a grandmother, mother and daughter about their personal experiences of issues such as marriage initiation, education and dating. The grandmother in one video explains that she was not allowed to pursue her education as it would have been seen as a challenge to male authority. The mother in the same video explained that she began schooling but was not free to complete her education, whilst the daughter revealed that she was expected to “go all the way” to university “without limits”. The videoed interviews identified clear changes in every aspect of culture investigated between each generation. This served as an effective means to deconstruct the idea of culture as unchanging and unchangeable.

Participatory video provided a new perspective and allowed participants to see culture and customs not as fixed but as socially constructed, always in flux, and over which they have some agency. As one research participant, Irene, commented:

“As a result of the workshop it’s made me have confidence. It has made me want to change the situation. Maybe if one day I have kids, or maybe a girl, as a kid, I would want my child to be brought up in a different way”.

By using participatory video, Irene was able to acknowledge her agency to provide freedoms for her children that she had not enjoyed herself. This should not be misinterpreted as a claim that participatory video can disappear the determining effects of structural power interests and unequal gender relations. The claim that is being made is that some participants gained insight from the affordance of participatory video to give video-makers critical distance from their situation [103], and to be able to reflect critically on it. The question might reasonably be asked “what advantage does participatory video have over a focus group or other methods?”

It would be possible to claim that the process affordances of participatory video to create a space for critical dialogue can be equalled in a focus group. However I argue that participatory video has functional affordances of rewind and re-edit that invite rehearsal and revision of voicing dissent. I have claimed that the ability of participatory video to allow a person to see themselves projected on screen as an authoritative commentator enhances self-confidence and self-esteem. I also argue that the technology of participatory video afforded participants the opportunity to view their own situation from a new perspective and provided the practical means to produce videos that constituted counter-narratives which challenged dominant gender norms and values in the way that the ‘Three Generations of Zambian Women’ video did [104].

4.3 Root Causes of Constraints

In the third round of video-making, participants were challenged to dig deeper to identify the structural root causes of the unequal gender relations that they experienced in Zambia’s ICT sector. This approach was adopted based on the logic that only by identifying the root causes, and acting on them, is it possible to transform the situation [105, 106]. In this round of video-making participants were asked to make videos that asked questions including “Who benefits from things being this way?” and “What action is necessary for change to happen?”

In subsequent focus groups, and in interviews with Asikana members and the men that they had interviewed in their videos, there was near unanimity that it is men who benefit from existing unequal gender relationships in Zambia. Men’s strategic interests in retaining wealth, control, status and power were attributed as root causes of unequal gender relations by research participants. However gender interests were not the only power interests that participants perceived to be structuring disadvantage. The participatory video process made evident other vested power interests. As Edith reported:

“We’ll probably even bring out things of tribalism now, where we say, for example, this one is from the east and I’m from the south, they will probably want to take in somebody from the east just because their manager or their boss is from the east ... there will be a bit of some tribalism, that would obstruct me”.

As a Tonga woman from Zambia's Southern Province, Edith fears that a Bemba employer from the North East might prefer to employ someone from their own ethno-linguistic group. Edith presents ‘race’-ethnicity

as another power interest that potentially co-determines a Zambian woman's experience of (dis)advantage. The importance of ethnicity as a social determinate in Zambia is confirmed by Posner [107] and Larmer [108] amongst others. Whilst there is a high-level of ethnic harmony and inter-marriage in Zambia, there is also a significant correlation between ethnicity, political power and patronage [109, 110].

Another research participant, Susan, travelled from Lusaka's informal settlements each day to take part in the participatory video workshops. Susan expressed her view that class is co-determinate alongside gender and 'race'-ethnicity in explaining (dis)advantage for Zambian women:

“People from out there in the compounds, the shanties and ghetto, that's where we need to teach more people about women and how they should change, and how they should come up, and how they should get educated ... Here in the middle-class suburb [where Asikana Network was located] people get more educated ... most of them have got their parents as role models. Take Bella, for example if she was from that side [the shanties] she would be pregnant or married or something by now”.

Susan's claim that the experience of Zambian women is structured by class, as well as by gender, is supported by existing literature. Hansen [111] found that in Zambia “gender is socially constructed in relation to class, to race, and to a host of other relationships”. In the case of the women of Asikana Network, participants identified intersecting power interests that included gender, 'race' and class. These findings support the conclusions of scholars of intersectionality including [112, 113, 114] who have illuminated the way in which multiple layers of (dis)advantage differentiate the experience and interests of women in relation to one another. The ways in which intersectionality determines the experience and outcomes of ICT4D is an important area for future research.

5. Discussion

In this research a particular, critical, appropriation of the technology of participatory video was adopted in order to enable Asikana Network members to enhance their critical-agency for development. Rapid iteration of the video-making cycle, combined with group screenings and critical dialogue, afforded women participants an opportunity to investigate and to speak openly about their experience of gender discrimination and disadvantage. The technology's affordance to rewind, review and re-edit footage not only enabled women to improve their technical and communication skills but also improved their self-confidence and self-efficacy [115]. These are achievements that women have reason to value in a context where social institutions, including the family, school, church, and workplace, systematically discourage and undermine the ability of women to take part on an equal basis with men.

In the three rounds of participatory video-making, the women of Asikana Network also used the affordances of participatory video to rewind and review footage in order to reflect critically on the circumstances that disadvantaged them. They used the affordances of critical dialogue and iterative video-making to investigate the causes of gender disadvantage, to identify a range of perceived constraints on women's development freedoms, and to attribute causality to a number of institutional and cultural factors as well as to intersecting structural power interests.

The video-making and critical dialogue processes highlighted pervasive myths about women's inability to perform well in maths and technology; constraints on their free time due to a gendered division of labour; and constraints on women's freedom to voice their opinions. The participatory video process of group investigation and critical dialogue afforded opportunities for peer learning and knowledge production

enabling participants to deconstruct dominant gender norms and values, and articulate a critical voice [116, 117].

The research also foregrounded a number of institutional mechanisms (family, school, church) to which participants attributed causality in (re)producing unequal gender norms. This corroborates the findings of Zambian researcher, Abraham [118], who argues that, 'a cultural and religious curriculum' exists to teach Zambian women to defer to male-domination. This hidden curriculum of unequal gender relations is even available as a printed manual for teaching girls their place [119]. The technology of participatory video afforded women the practical means to critically investigate and challenge unequal gender relations. The video "Three Generations of Zambian Women" is one example of the affordance of participatory video to deconstruct and challenge dominant cultural norms and to realise people's agency to produce counter-narratives [120].

Whilst participants may have good reason to value new technical and communication skills and efficacy, as well as the ability to challenge dominant gender norms, it is argued here that these valuable outcomes do not, in and of themselves, constitute critical-agency as they do not challenge or change the structural power interests which give rise to and sustain unequal gender relations [121, 122].

However Asikana Network members were also able to employ participatory video to identify the structural root causes of the discrimination and disadvantage that they experience. The particular critical appropriation of participatory video that was innovated for this research afforded women participants the ability to identify intersecting power interests structuring women's disadvantage. Whilst men's interest in retaining power and control was the most attributed root cause, the power interests of 'race'-ethnicity and class (dis)advantage were also suggested. The technology of participatory video afforded the women of Asikana Network the tools to iteratively deepen their excavation of root causes and to present their findings to Asikana founders, who participated in the focus groups in order to inform the organisation's strategic plan and activities. These discussions prompted new ICT4D initiatives by Asikana Network including the design and production of a Women's Rights App, which was adopted by Facebook and provided to all Zambian users of the Internet.Org initiative [123].

6. Limitations

The original research design imagined working with a single cohort of women over an extended period of months. In reality there were seven different cohorts of women each taking part for a period of five to ten days. A longer period of engagement may have made it possible to attain a higher level of video-making skills and critical-agency. In retrospect, the assumption that women would be free to attend for such an extended period of time was naive. Unequal gender norms, that make Zambian women responsible for cooking, cleaning and childcare, limit their freedom and mobility in ways that men do not experience [124]. For some participants obtaining parental permission to attend, as well as money for lunch and bus fares for five days, required rising at dawn to complete chores. Reflecting ethically on women's 'time-poverty' relative to men [125], and on the sacrifices involved in attending the workshops, it felt necessary to shorten the duration of the programme to accommodate these realities. Providing stipends and travel reimbursements to participants was considered but it raised other ethical issues as Asikana were not in a financial position to provide fares or stipends for their regular programme of ICT workshops. Learning from this experience, in future engagements creative ways could be sought, in discussion with the host organisation, to extend the length of engagement, perhaps introducing phases over time.

A second limitation related to the training of Asikana co-facilitators. Whilst I initially taught the video-making myself and facilitated the critical dialogue discussions alone, I trained three Asikana members to become facilitators of later workshops. These women first co-facilitated alongside me and then alone in my absence. They quickly became proficient technical trainers of videoing and editing. However I under-estimated the tacit knowledge of critical theory and practice that underpins facilitating workshops

designed to enhance critical-agency. On another occasion more time could be built in to develop co-facilitators' capacity in these areas. These capacities are crucial in achieving a critical participatory video practice that enables participants to investigate and critique the power interests structuring the disadvantage that they experience, and gives critical participatory video practice its 'transformatory potential' to challenge and overcome gender inequalities [126].

I have since reflected on the positionality ethics of the researcher, as a privileged white male, making suggestions for the subject for video-making in the Three Generations of Women film (rather than adhering to the problem-posing methodology). In interventions that aim at development there is always a tension between unveiling structures of oppression and robbing participants of their agency [127]. Freire [128] is clear that a facilitator has responsibility for problematising and concentrating attention on a learning object, but on another occasion I would hope to achieve this through problem-posing to elicit participant ideas rather than providing my own.

7. Conclusion

The field of ICT4D lacks detailed case studies of women's ICT4D organisations tackling gender injustice. This paper provides a case study of women's ICT4D use in Zambia's ICT sector. It includes knowledge from the standpoint of Zambian women about their experience of gender injustice in the ICT sector, their understanding of its institutional (re)production and structural root causes, and foregrounds their collective agency to overcome it.

If we accept the argument of scholars that human development should be conceptualised as an agency-based process in which disadvantaged people are enabled to actively pursue their own well-being and values; and we accept that this regularly involves questioning deep-seated power interests; then we must agree with Sen and Freire that enhancing people's critical-agency is important for tackling inequality of all kinds, and central to the task of development. Following this logic ICT4D initiatives should aim to enhance the critical-agency of disadvantaged people to be the authors, architects and arbiters of their own development.

Asikana's production of videos produced new knowledge and enhanced participants' critical-agency for development. This research found that participatory video has a combination of affordances not found elsewhere. The functionality of participatory video to rewind and re-edit, and to allow a person to see themselves projected on screen speaking authoritatively, can significantly enhance a person's self-confidence and self-efficacy. Participatory video also allows non-experts to produce counter-narratives to challenge dominant gender relations. The process affordances of participatory video, that enable critical distance and provide a safe space to discuss taboo issues, were also shown to be valuable in a development context. Finally, the rapid iterations and frequent critical dialogue incorporated into this appropriation of participatory video enabled participants to conduct their own progressive excavation of the institutional pillars and structural root causes of gender inequality in Zambia's ICT sector. The women of Asikana Network were able to further their practical interests in technical and vocational skills in video making, and to use those skills to further their strategic interests in developing their collective critique and action to challenge gender inequality. Their insights now inform Asikana Network's on-going work to challenge gender inequality in Zambia's ICT sector.

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