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Abstract. Participatory Design (PD) and service design have shown great potential in co-designing feasible solutions with marginalised societies. This study is part of a research project where dwellers in the informal settlement of Havana in Windhoek engage in context analysis for the establishment of a community centre offering technologies and services supporting the unemployed in finding work opportunities, self-employment and training. Participants first walked us through their neighbourhood pinpointing existing challenges they then communicated through persona sketches of local disadvantaged individuals like prostitutes and criminals. Societal issues, collective representations and sociotechnical gaps emerge, and participants reimagine these into work opportunities, enterprising, community cohesion, and overall alleviation and life improvement. The object of research is to align social realities, existing technologies, and design requirements to ensuring suitable usability, financial affordability, fulfilment of User Experience, and the ultimate self-sufficiency of community and overall project. This paper ultimately argues User-Created Persona (UCP) in PD as a fruitful inquisitive proceeding to explore and augment pervasive and smart work possibilities in locales with limited opportunity and resources.

Keywords: Participatory Design, Service Design, Work Analysis, Personas, HCI4D, Micro-Cultures, Walking-Method, User-Created Personas, UX.

1   Introduction

Participatory approaches to development in the Global South have been established over the past decade. A number of participatory initiatives in Southern Africa have been launched with a primary focus on empowering and engaging marginalized youth currently excluded from the job market. While the youth unemployment rate is alarmingly high in Southern Africa, the potential in co-designing feasible solutions with marginalised youth has been demonstrated eclectically [25, 27, 32, 33] by deploying

different methods of service design, PD and living lab approaches locally. Much of the PD literature cautions researchers about fundamental differences of the conceptualization of participation in different contexts and the need for a situated adaptation of methods [37]. Personas have been a widely used technique in User-Centred Design (UCD), which, however, in a cross-cultural setting carries a high risk of misinterpretations [5]. Thus we propose the use of User-created Personas (UCP) as one of the newly revised techniques in the form of a fruitful inquisitive, TV-based proceeding to explore and augment contextual understanding in a cross-cultural setting. Personas created by users hold the potential of empowering regular people to define who they are and what they need in their current lives, as well as in endearing regular users to the technological design process. This is possible because designing in their own footings regular people can naturally express their needs, requirements and aspirations.

Our current community outreach work, scientific research and aims concur with, and strive to align with some of the actual needs, requirements and aspirations of youth dwellers in the informal settlement of Havana in Katutura, Windhoek, Namibia. Scaffolding from the above, this study dissects and analyses a series of actions where youth living in Havana engaged in context analysis towards the establishment of a community centre that seeks to offer services and technologies to support the unemployed to finding work opportunities, self-employment and training.

In this paper we analyse and report how youth in Havana take-on, understand, and create persona artefacts as part of the context analysis and design of a better future. This specific study is part of the first author's research agenda on establishing how different ethnic groups in Namibia conceptualize and construct personas [13, 14, 15]. The objective of this intervention is, hence, to find out how user-created personas may assist to better understand the needs, requirements and aspirations of the youth in Havana, and how such personas may eventually benefit the development of the series of services and technologies proposed such as the job-search apparatus among others.

In the following section we briefly introduce the wider literature on personas in non-WEIRD (Western, Educated, Industrialised, Rich and Developed) countries [18]. We then introduce the project context, methods deployed, and a briefing on findings. Methods described and analysed in detail follow, while a discussion on them leads to conclude to have established the value of UCP as a participatory approach to appreciate the context and design services and technologies in collaboration with the youth.

2   Personas for Development

Human Work Interaction Design (HWID) endeavours to better understand relationships between concepts and methods in Human-Computer Interaction (HCI) and their meanings to local and indigenous groups [7]. A paucity of empirical HWID projects in developing venues, however, contrasts with ventures in HCI for development (HCI4D) that strive to enable and empower people in underserved or marginalized

populations worldwide [1]. Some of these projects test, question and repurpose research and usability methods [2, 5, 6, 22], while others propose processes where engagement with locals is in their very own terms [9]. The array of perspectives, nevertheless, parallels present rates of unfruitful deployments [3], which some argue due to ideas in developing venues maturing slowly and over time [39].

Grounded on their work with unemployed youth in low-income settlements nearby Kampala, Uganda, [16] point out the significance of choosing the right methods to establish engaging research relations, as well as to gain a deeper contextual understanding. This, we argue, is because groups of humans coexisting in developing contexts do so under specific historical and geo-physical conditions that peculiarly characterise the dwellers and environments such as those in townships.

We postulate that such milieus function as micro-cultural contexts whereby to develop a small model of culture could either be gradually expanded into a larger model, or, to our current aims, it could evolve into a more manageable assembly of people's characterisation and placing regarding sociotechnical needs and aspirations [24].

Eyeing through such lens, we propose local youth in Havana to conform and design persona artefacts as characters for a TV-series based on the surroundings, as a possibility to mediate the improvement of their lives through the establishment of the community centre and technologies proposed. Such personas attempt to magnify the needs and requirements of locals to communicate them to the design process. Developing characters for the TV-series serves as training part of the overall engagement of the youth in activities proposed by this project to ameliorating lives in Havana [38].

In this vein, we propose the deployment of UCP as an means to (1)facilitating youth conveying their identities, surroundings and daily experiences; (2)continue exploring persona as a communicational tool in Namibian sites [13,14, 15] by openly proposing it to final users through engagement, reciprocity and doing [4]; (3)keep investigating the debated and scarce pragmatism of persona in HCI [36]; and (4)to assist the overall 'discovery' of persona artefacts beyond Western settings [29].

Our argument on deploying persona scaffolds from the paucity of general empirical research [31] and the fact that the scarcity is even greater outside the West [30].

At the time of writing this manuscript, most research has positioned personas in contexts beyond WEIRD [20, 23, 17] by deploying template-styled outfits similar to the initially conceived by Cooper [8] in the US, namely a written narrative, a picture and a name [26] that strive to represent a group of users with common goals, attitudes and behaviours when interacting with a product or service [34]. Persona's core motivation, though, contrasts with recent ethnographic studies that reveal its dubious utilisation, and therefore effectiveness in UCD, WEIRD settings [11]. Lacking hence an ultimate consensus, many researchers and practitioners hold prejudices on the value of persona as a design communicational tool [36].

In India Katre [22] and Chavan and Prabhu [5] claim persona as it is commonly known is impeached with cross-cultural assumptions. Adapting persona a la Bollywood for usability testing, Chavan and Prabhu claim it facilitates a more effective user-designer communicational exchange in Indian settings [5].

Nielsen [29] hence ultimately problems whether the persona artefact, in taking the role of a translator of usability constructs and goals of User Experience (UX), may be taken-on, understood, created and transferred equally across cultures.

In this vein we first maintain the persona artefact has not yet been provided with ample enough occasions to be guided and fabricated by the consumers themselves. Based on previous [13, 14, 15] and ongoing experiences [12], then, we argue persona in Namibian sites holds potential in allowing people to genuinely depicting themselves for the usage of technologies.

3 "Live Design. Transform Life" Project

This project stems from an ongoing venture by the School of Computing and Informatics at the Polytechnic of Namibia (PoN) into co-designing new services and technologies with marginalized youth in urban and rural Namibia through service design. The overall project aims to explore how mobile applications and innovative service design balance formal education to develop youth, thereby opening new and viable career opportunities [32].

3.1 Research site

Since October 2014, one of the pilot sites of this project has been the Kabila Community Centre in Havana, one of Katutura's informal settlements in Namibia's capital Windhoek. Katutura means *we do not have a permanent habitation*, as black communities were forcefully allocated, and tribally segregated here by apartheid during the 1950s and 60s [21]. This heritage makes Katutura to hold on to a historical susceptibility towards unemployment, lack of services and amenities [10]. This is despite more and more people move to Windhoek hoping to find employment and a better life. And yet approximately half of Windhoek's population lives in Katutura with a traditionally overwhelming majority of rural-urban migrants [28].

Havana is an informal settlement in Katutura that currently holds a scarcity of basic living facilities typical of slums [39], such as adequate housing, electrical reach, access to potable water, and hygiene resources like proper showers to serve sanitation. Wastelands surrounding inhabitants' shanties, drunkenness, and a lack of education are, instead, the daily encounters for the inhabitants in such site. In turn, this situation neither helps the intellectual and humanly growth, nor favours employment, a rather bleak issue in this particular locale, as well as in Namibia as a Nation [38].

3.2 Research aim

The object of this particular research is to identify sociotechnical gaps, to communicate these to design through the UCP to eventually device optimal community interactions around physical spaces, available technologies and logistics anew. The pragmatic objective is to establish socio-technical requirements and align them both, with existing situations and to the technologies available. The final aim is to align social realities, existing technologies, and design requirements to ensuring suitable usability, financial affordability, fulfilment of UX, and the decisive self-sufficiency of the community and project.

3.2 Research approach

This project is carried out within a PD framework encompassing service design as the pragmatic conceptualisation, and as the object of the technological design per-se. Theoretically, the focus of this research is grounded on previous UCP empirical experiences in Namibian ethnical contexts [13, 14, 15].

As per different phases and stakeholders involved in the process, an initial group of PoN and international students explored challenges and possible technical solutions in Havana and found out that there was a need for a job-search tool. Since then, a second generation of PoN students engaged in developing the job-matching-ranking system, as well as in promoting entrepreneurial activities through a challenge-based approach.

Participant youth in Havana, thus, engaged in work analysis in preparation to launch a community centre and a technological job-search tool initially identified as a need. Both items aim to alleviate local unemployment by providing training and work opportunities. The account narrated below consists of the phases and concurrent activities such as contextual mapping and need analysis that took place in the form of Walking Havana, User-Created Personas (UCP), Interviews and Enhanced UCP.

3.2.1 Walking Havana

Walking Havana aimed to inform researchers on local realities and socio-technical gaps by mapping-out the geography and physicality of the Havana area. Researchers proposed this as a 'location scouting' typically utilised in film and TV productions. The objective was to enable participants take-on the role of location scouts and spot and narrate genuine localities depicting realities in Havana for the TV-series.

3.2.2 User-Created Personas (UCP)

Participants then engaged in creating embodied sketches of regulars in Havana. The objective was to assist depicting characters for the TV-series that are distinctive of the settings shown through the Walking Havana method. In creating such characters, participants communicated explicit and implicit needs, requirements and aspirations towards the design of environments that hold the potential of facilitating a more humanly progress in life.

3.2.3 Interviews

Concurrently, semi-structured individual interviews attempted to find individuals' needs, requirements and aspirations. While these interviews support the findings of the larger project in regards, for instance, to technology ownership, it is in the informality of some of the conversations we found fruitful experiences in regards to the engagement and reciprocity between researchers and local participants in the process of doing [4]. This aids to better understand and therefore keep aligning the aims and objectives of the community and those of the researchers.

3.2.4 Enhanced Personas

In a later intervention participants further developed the above personas and reimagined these into enterprising and work opportunities, community cohesion, and overall alleviation and life improvement recounted as a series of challenges in [38]. In further proposing UCP, the aim was to build upon data previous participants had found relevant in representing some of the needs, requirements and aspirations towards promoting a grounding of the personas initially worked out to establishing sociotechnical gaps through the addition of scenarios.

Each of the sections introduced above and detailed below, presents now the method initially chosen and its intended in-depth utility, as well as the actual deployment and outcomes provided using each of them.

4   Walking Havana – Revealing Sociotechnical Gaps

Walking Havana assisted five female and male locals and five PoN researchers to initially identify local realities by mapping-out the area's physicality (Figure 1).

The walk got proposed as "location scouting" for a pilot TV-series based on the joint-challenges and activities to be undertaken in Havana [38]. So, it got filmed and photographed for such purpose and for research analysis as well.

Participants pinpointed an overall paucity of electrical reach, grim access to potable water, wastelands around inhabitants' shanties, drunkenness, and scarcity of hygiene resources where public decaying open-showers serve locals for sanitation (Figure 2).

Fig. 1. Participants walking Havana.   **Fig. 2.** Hygiene, spirits, illegal wiring, water, wasteland.

They also indicated regular power cuts (as occurred in the persona session below), and pinpointed ongoing brick structures and cementations intermingled with shanties.

Mapping Havana revealed sociotechnical matters typically attributed to slums [39] for their basicness in needs and nature. For the purpose at hand, however, this seemed material enough to consecutively propose participants to create 'persona characters' inspired by Havana local inhabitants and their environments.

5   UCP - Embodied Underrepresented Sketches

Scaffolding from the walk, and continuing with the plans for the TV-series, participants plus two new late-arrivals developed some characters depicting Havana locals. Pens, markers, newspapers, magazines, and A4 and A1 paper were layout, and the youth split into Groups A and B. The aim was (1)to observe who in the community gets characterised; (2)to explore the reasoning behind such choice; (3)what information would emerge from characterising locals; (3)to what extend this facts resonate with issues encountered in the walking session, and (4)how the participants ultimately would build and depict characters on their own.

It is worthwhile noting participants have not yet been introduced to the persona tool. We postulate this legit to avoid rhetorical hurdles, jargon impediments, and the unnecessary inconvenience of some abstractions in technicality and HCI concepts [6]. Instead they were asked to create "actors" for a movie to be co-directed by them.

After 20 minutes Group A presented a written narrative entitled "Living like Slaves – Havana Location": 19 year-old Eddy came to live in Windhoek aged 16 and currently lives in a shanty; he cooks with firewood and has no direct access to electricity or water (Figure. 3).

Group B produced a collage entitled "Unemployed Youth" from press cut-outs and handwritten text (Figure 4). The collage consisted of collective characters and several joint-background scenarios that explain why and how a local female and a male turn into prostitute and gang member respectively through time and unfavourable conditions in the vicinity.
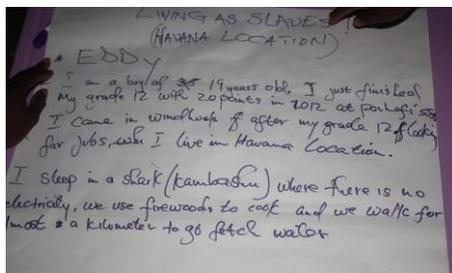

Fig. 3. Description of "Eddy" Character.

Fig. 4. Collective characters - holistic stories.

"Tselestina and her friend undergo hardship and decide to stand outside a club "for hunting" foreigners looking for escorting (Fig. 4, centred); Sequentially, Alomgombe and Johanes got stopped and arrested to custody in a shopping mall (centre right). Meanwhile, 5 year-old Tselestina, Alomgombe and Johanes are "playing at their location" while dogs eat from a dumping site beside (top left corner). Top right corner, a press cut-out and written text tell on parents rallying against (1)high youth unemployment, (2)children standing by dumping sites, and (3)to achieve better housing. This is further supported by another cut-out (far right top) where there is a casserole with the words Education and Success embedded and steaming from the pot; and a burning fire underneath with the words Teachers, Parents, Pupils rooted in the logs. Bottom-left, the pictorial shows people rioting with burning tires, while the narrative describes shanties burnt because of paraffin stove and candles' indoor use.

While Group A portrayed a brief written description on Eddy's housing situation *living as a slave*, it delivered no further detail about situational causes on Eddy's life. Group B however provided relational causes and consequential effects through graphic and text association in the narratives of the two main characters of choice.
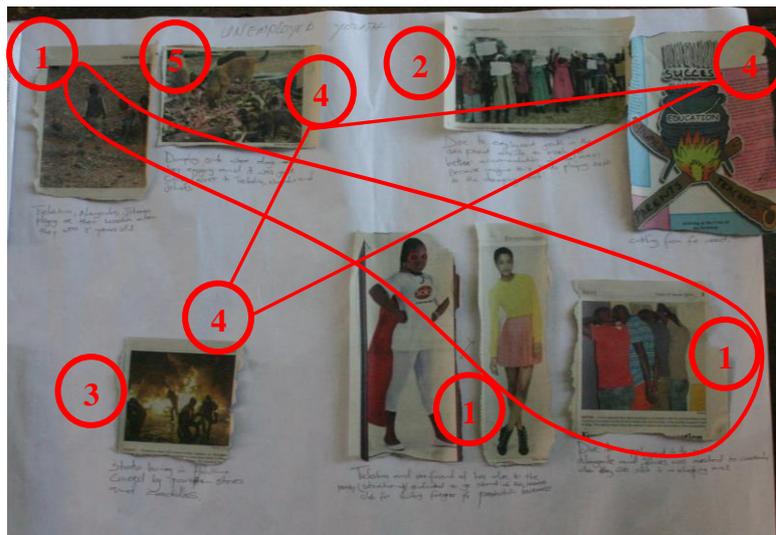

Fig. 4.1. Collective personas - holistic scenarios.

Relationally, Group B (1)interwoven Tselestina and Johanes' background stories from childhood, (2)implemented mothers as supporting characters, (3)rioters playing 'extras', (4)dogs, food leftovers, and car wheels as commonly encountered props, and (5)local sceneries as backdrops (Figure 4.1 above). They also conveyed a particular pairing of pictures whereby people (i.e. personas) and settings (i.e. scenarios) were exposed side-by-side. Consequentially, individuals' personal issues came together depicting a strong sense of community support that illustrates the enrooted sense of holism in family union and public resilience prevailing in these settings through the years before apartheid [35]. This parallels previous political accounts of UCP research

in other Namibian settings where alien invasion has also shown its signs of inheritance in the people's longing [14]. The accounts and major concerns perceived and expressed by the dwellers seem to furthermore resemble previous narratives collected with unemployed youth in the capital [32].

6   Individual Interviews and Informal Conversations

Along the above interventions, individual stories are continuously collected in the form of separate interviews. While this data will be used for different research purposes, the aim in relation to the present study is to compare "real stories" with those created in the actors' stories in order to evaluate the usefulness of UCP in this context. Moreover, this established a baseline data on the tenure of basic and smart cellphones.

Informal conversations with one participant, besides, revealed a genuine, quasi-adamant interest in acquiring a set of musical instruments for the community centre. As part of the overall community-centred system in Katutura, there are dated recounts of 'the tribal court' and the brass bands ethnic groups living in Katutura until terminated by apartheid [35]. This may not seem part of work analysis to practitioners outside the Arts world or not acquainted to History. Yet, it provides with an array of implicit possibilities for the future of technological pervasiveness in these settings.

7   Reshaping UCP: Establishing Sociotechnical Gaps through Sticky-Note™ Scenarios

From the persona-characters in the first UCP session, a further session attempted to reassess, align, and consolidate sociotechnical gaps through further developing the characters for the TV-series. Sixteen participants (eight new in this session) were orally and visually reminded of, or introduced to the previous persona outcomes. Then they split in 2 groups, i.e. Group C and Group D, and were provided of pens, markers, Sticky-Notes™ and both, blank A1 posters and the initial persona posters. Group C was compounded of children and teens, and facilitated by a PoN researcher. Group D were older participants, some with a genuine interest in entrepreneurship. No one facilitated the latter.

The facilitator to Group C opened the session emphasising the aim to further shaping the characters elicited by the previous group (i.e. Group A) towards the TV-series. The facilitator equally intertwined the words persona, persona and character when inaugurating the session. This aimed to find out if one term may prevail over others.

Participants then scaffold from the initial characterisation of Tselestina, her friend, Alomgombe and Johanes (Figure 4.1) and built further on them by first discussing existing findings, and subsequently proposing further themes, storylines, concepts and ideas summarised in the Sticky-Notes™ they tucked to the existing poster (Figure 5).

Among the issues highlighted in this session, Group C reiterated matters pinpointed in the walking method (Section 4 above) such as poverty in the location, crime problems, hygiene, health, littering, and a lack of water and electricity. Further issues also emerged under the themes food, malnutrition, transport, money, care and parents.

Group C continued making relational pairings of some of the issues previously stated, in a similar way preceding participants had done in the initial UCP session. One Sticky-Note™, for instance, stated as follows in relation to parents and transport:

1. In our areas everyday parents walking a long way to fetch water and collect firewood. 2. Walking a long distance for Hospital and take child to school.

Participants implicitly related the above long distances walking and the physical effort this takes, and to the time, care and attention walking consumes from parents. Further issues such as the collection of firewood by having also to walk about, thus, added further socio-technical issues such as the one in further paired Sticky-Notes™:

Cooking everyday: By the use of firewood, gas and paraffin stoves can result in burning of shacks.

As for the electricity, participants opened a Sticky-Note™ where they stated: *Electricity for children/students to study properly at night for the tests and exams.*

Group C also concluded oral accounts of what a particular persona would sometimes say or think would be relevant. Such accounts were considered, though they were not materialised in the final personas.

Eventually, Group C decided to summarise their findings into two character profiles typical of UCD personas proceedings: a learner/student and a parent (Figure 6).
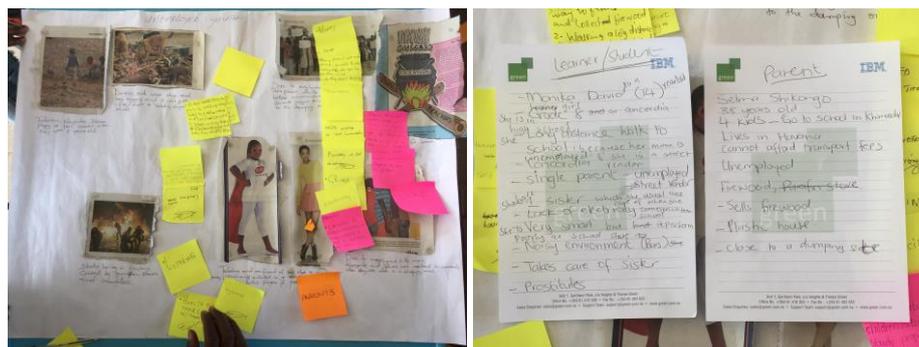

Fig. 5 & 6. Personas developed on Sticky-Notes™ & Two Persona profiles: student & parent

Meanwhile, Group D engaged in the local politics involved in the issues at hand, though they left aside the physicality of the initiating personas from groups A and B.

Group D did not hence provide further insights to the existing personas as per needs, requirements and aspirations. Yet, by discussing political issues they implied further stakeholders and proposed ways to undertaking interactions with them (Figure 7).
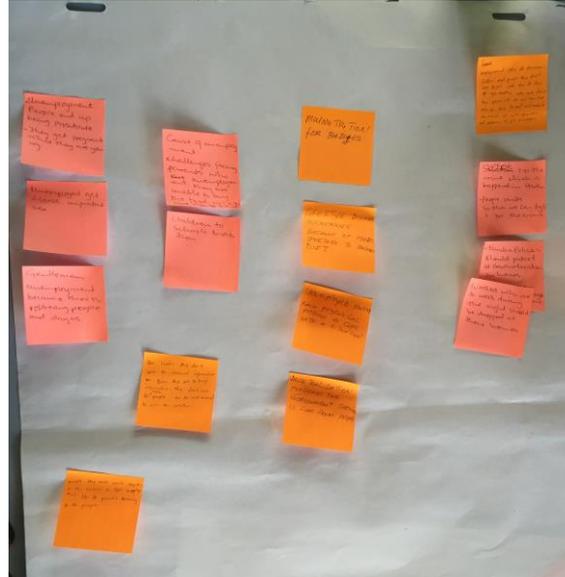

Figure 7. Group D - Political issues and further stakeholders in the process.

One of the issues discussed and summarised by Group D was on political leaders: *Our leaders they don't use to delivered information on time, they use to keep information; they don't use to come to people to look around to see the location.*

They went on stating a need for community togetherness to counteract positions: *People they must work together in the location to fight unemployment like to provide training to the people.*

A further Sticky-Note™ identified governmental programmes as present failures: *Decentralisation program for government services is far from people.*

Group D thus also expressed needs regarding Namibia's Police forces and crime: *Namibian Police should patrol at Havana location, and workers who use to work during the night should be dropped at their homes.*

The meeting ended with all participants thanking researchers for what they seemed to have learnt in the session and eagerly requested when the next session was to be.

In this session we found that when participants work in homogeneous group-ages, results evolved in two ways: groups of older participants with a flair for entrepreneurship conveyed more formal, bureaucratic, and implicit ways of embedding challenges in the community by extrapolating them to the involvement of other stakeholders such

as councils, political representatives, police forces, etc. Yet, personas were not developed as such. Younger participants, though, stuck-in to the task at hand and implemented further user-data to the original personas. Besides, they explicitly and repeatedly referred to the characters dealt with as, we argue, these were youngsters like themselves. Thus, the personas were more relatable to youngsters, whereas experiences of older participants where to more mature community members and organisations.

8   Discussion

It is worth noting Havana participants have since the inception of this venture varied across the different activities, though most of the participants are youth, come on a voluntary basis, and most of them have attended more than one session. The number of participants per session also varies between four and fifteen, with often a great number of late comers in the middle of started sessions.

In testing methods, walking the neighbourhood provided researchers with an indication of the challenges faced as shown and explained by community members. Therefore, we corroborate walking as suitable in this setting to spot challenges and also in establishing those as part of work analysis. Further future walks may hence provide with on-site solutions to the challenges of unemployment. It can also create further awareness in possible actions to undertake by youth involved in the project.

The two UCP sessions have provided with both, an effective and engaging workability in using the TV-series proposal throughout and a provision of collective persona representations that acknowledged the main "actors" as local youth that could somewhat be anyone in the community due to the present challenges. Moreover, Group B in the first session showed a natural understanding in: (1)characterising main actors, (2)depicting and joining background stories, (3)supportive and engaging secondary characters, (4)extras, and (5)the props supporting and (6)enhancing scenarios. They have also shown a natural skill constructing narratives compounded of preparation (i.e. childhood), climax (i.e. characters' present situations) and resolution (i.e. mothers protest, others riot). This approach has hence enabled participants to elicit the risks undergone by youth in Havana, as well as sociotechnical gaps to be filled.

Group C were older participants who referred to issues beyond youth personas. While these concerns did not provide to the personas elicited, they enabled a further understanding of the pervasiveness of, and organisational and political issues in the community. Group D was formed by younger participants who readily related to the initial personas and provided with further relevant data both, orally and on paper. This all has shown UCP elicited in PD as a useful method to combining skill and experience, while forming complementary groups of in-situ stakeholders and those beyond.

9 Conclusions

This research attempted to elicit sociotechnical gaps in the informal settlement of Havana towards establishing a community centre and launching a job-search tool to alleviate youth unemployment in the community. We established that sketching personas in PD must be considered in developing pervasive systems for these settings, as this showed to provide towards community reliability, co-existence among stakeholders and activities carried out, as well as consistency, and mutual support as societal positives to nurture and maintain. The use of personas has also been fruitful as an inquisitive process to initially explore and augment pervasive and smart possibilities for work in locales with limited resources.

Finally, the TV lens provided of engagement and reciprocity in the doings in Havana. Adopting TV-related roles such as location scouters and proposing this exercise a potential TV-series, participants for further motivated to get the venture going forth.

Acknowledgments

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