ICTD within the Discourse of a Locally Situated Interaction: The Potential of Youth Engagement

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Abstract

ICT4D 2.0 has marked a major conceptual change toward a more human centered development in its methodological and project management approach. Participatory action research has established itself as a promising practice within the discourse of social embeddedness. Situated in local interactions we thus engaged youth inhabitants of an informal settlement of Windhoek into tackling unemployment, which is presenting a major threat to the national socio-economy. We used several distinct methods across the project, following three different research and intervention threads simultaneously. First, we pursued the process of development of useful technologies. Second, we explored various methods for context mapping and early design inspirations. Thirdly, we ventured into an action-based intervention promoting service thinking and entrepreneurial skills. We have established that participatory approaches hold the potential to unleash the youths' ability to conceptualize and reflect upon their own context, jointly explore social innovation design, and support the implementation of the services and technologies determined. Hence, we postulate that ICT4D 2.1 should strive to close the technology design gap through a responsible community engagement and a specific focus on the empowerment of local actors which are revealed through a reciprocal co-design process.

Keywords
Youth engagement, Community-based co-design, Participatory design, ICTD, situated action.

Introduction

Development Informatics has undergone many transformations where more failures and disillusionment than actual successes have been seemingly reported over the last 25 years. Heeks (2009) assigns those failures to the limitation of the first phase of ICTD and introduces ICT4D 2.0 with a focus on genuine innovation and solid implementation models that possess a different focus on technologies and worldviews alike. Many failed tactics and lessons learned have hence contributed towards approaches aligned with wider paradigm shifts in technology development globally. In the same vein, diverse research perspectives, viewpoints, values and motivations are depicted through the different disciplines and contexts within the ICTD literature (Avgerou, 2010).

A major drawback of earlier and present ICT4D approaches is that many projects are implemented in a top-down fashion, with donor agencies, governments and others in positions of influential power deciding what are the needs of communities without either providing much attention to the analyses of needs, requirements and aspirations of such communities, or overriding the very consultation with communities initially, throughout, and beyond the deployment of projects. With the shift towards ICT4D 2.0, more inclusive methods in project implementation and management such as Participatory Action Research (PAR) become of outmost relevancy in aiming for sustainability (Steyn, Rampa & Marais, 2013) through engagement, reciprocity and the consequential doing (Brereton,

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Roe, Schroeter & Lee-Hong, 2014).

These ideas link up with an organic social approach to ICT projects, as opposed to the more classic positivist and technologically-deterministic approaches of earlier ICT project implementations. Hence, solutions held as “easy”, such as ICTs, and within these specifically mobile technologies heralded particularly by mass media to be the universal solutions to all the problems of the poor, have and do disregard the complexity of cultural values, community life, human to human interactions, and the vast amount of background knowledge and skills required to sensibly make use of ICTs.

Aker & Mbiti (2010), nevertheless, argue that though mobile technologies offer intriguing chances for development in unindustrialized sites, these should not be seen as "silver bullet" solutions for complex problems and social situations. Mobile technologies have however developed considerably since then, and the reach of the smartphone technologies currently offers a much wider set of tools than older cell-phones did just few years back. Mobile technology can therefore be used in our times to solve problems in developing countries in a completely new array of ways.

A natural consequence has thus been that researchers are reticent towards the "universality" of ICTs’ benefits, hence seeking first to discern the human factors affecting the sustainability and impact of ICT4D projects (Avgerou, 2010). ICT4D researchers have realized that the above and the empowerment and sustainability of communities alike become a fundamental element in their project conception, planning and ultimate deployment.

Our point of departure in past and present engagements with marginalized youth postulates situating local interactions in participatory approaches that promote the empowerment of youth to delve into self-reflexive, critical contextual mappings to creatively contribute to designing a better future for themselves, and committing to the implementations thereof (Ongwere, Winschiers-Theophilus, Iipito, & Chivuno-Kuria, 2014; Cabrero, Winschiers-Theophilus, & Mendonca, 2015).

Hence, this paper first presents the theoretical underpinning of our ICT4D endeavor. Then, it introduces one of our current projects with and by the youth in the Havana informal settlement in Windhoek, Namibia. The paper describes a variety of methods used and the outcome achieved, and then presents our reflections as researchers. Based on the latter, it finally discusses extracted themes and suggested values to constitute a new paradigm of ICT4D 2.1 in regards to community engagement and technology development.

Theoretical underpinning

We situate our work and philosophy in what (Avegerou, 2010) conceptualizes as “social embeddedness” of the ICT process within development transformations. Our methods on the ground are deeply rooted in the philosophy of Participatory Design (PD) and Action Research (AR), which have evolved over the years within our design contexts in Namibia. With an equal commitment to design research, community engagement and social change, we subscribe to what we have framed as community-based co-design (Kapuire, Winschiers-Theophilus, & Blake, 2015).

Social embeddedness

Avgerou's discourse on ICT processes and developmental transformation distinguishes transfer and diffusion processes from socially embedded processes. The later resonates with Suchman's concept of "situated actions" (Suchman,1987) which reminds us to understand people's actions in the context in which they think, reason and act thus situating ICT development in the local context. Considering the different actors in the social setting contributing to the developmental transformation shifts the focus of ICT innovation.

> "It traces the cognitive, emotional, social and political capacities of individuals that are usually nurtured in their local social institutions towards the unfolding of successful innovation efforts. Through this approach, the socially embedded innovation discourse sheds light on what is locally meaningful and desirable, or controversial, and therefore, on how technology innovation and organizational changes emerge (or are retarded) amid the local social dynamics." (Avgerou 2010)

Participatory approaches

The concept of user or stakeholder participation has been well-established on a conceptual and methodological level, despite showing great variances and challenges at a practical level. Fuzzy considerations of distinct value systems and socio-cultural settings have triggered much debate around universality and transferability of participatory concepts and methods. Winschiers-Theophilus, Bidwell, and Blake (2012) suggest a situated adaptation of methods and conceptualisation of participation. From a researcher's perspective engagement may be considered at many different levels, from participants as informants to co-researchers in any or all phases of a project, though ideally included from the project conceptualization phase onwards (Winschiers-Theophilus, Zaman, & Yeo, 2015, Kapuire et al. 2015). Often due to time and cost constraints, a deep involvement is not always possible. Moreover Steyn et al. (2013) argue that entire communities cannot be fully involved for a variety of reasons, though legitimate representatives can be selected from within the community. The choice of representatives and their relationship to the researchers determines the dynamics of the project. Many participatory projects have been initiated by outsiders, which carries the high risk of an unequal power distribution throughout the project. On the other hand, Braa and Sahay (2013) encountered political resistance and power struggles hampering local development and the ultimate deployment of a Health system in different countries in the global South. Thus Avgerou (2010) and many other contemporary authors in the PD scene emphasize the importance of a more politically aware, critical perspective on participation.

Engagement, responsibilities and commitment

The 'invisible' work of engagement is frequently overlooked, yet it plays an important and often pivotal role within many design-based research projects (Chamberlain, Crabtree, & Davies, 2013). In all long-term partnerships, roles, responsibilities, expectations and benefits normally are continuously renegotiated within a fluctuating context influenced by outside parameters such as funding and politics, as well as researchers joining and leaving the different projects (Winschiers-Theophilus et al. 2012).

A recent study by (Kapuire et al., 2015) investigates the motivation and reasons of rural community elders' commitment in Eastern Namibia into a long-term PD research project with a high research output, yet with a relatively little technological advancement within the village. Elders stress the meaningfulness of the learning process during the co-design sessions, the repositioning of indigenous knowledge and themselves as holders of it, and the intrinsic pleasure of participation itself as outweighing issues of limited resources and technological advancements.

In academic settings, concerns about staff and student development within a paradigm of AR and PD must follow procedures that respect participants themselves as much as gatekeepers (Winschiers-Theophilus et al., 2015). This is equally paramount in international and national collaborations and funding, where applied research and developments (R&D), and community outreach project in the context of national development plans must adopt the procedures that are established between and by the communities to work with.

In the context of an academia-community driven R&D collaboration, we, in our projects, have three overarching goals, namely (1) skill transfer to students and community members, (2) positive community impact, and (3) creation of new knowledge. These goals define the nature of our interactions with the community.

All in all, we maintain engagement and reciprocity as paramount foundations to maintain healthy relationships among all parties involved in the research and design processes (Brereton et al., 2014), as well as sustainability of projects - be this coming from the communities themselves or stirred-up by researchers and practitioners.

Project Context

Youth Unemployment in Namibia

Namibia has a population of 2.1 million, with a youth unemployment rate of 41% according to the Namibian Labour Force (Nhongo, 2014). Many youth are being deprived of a sustainable livelihood by the combination of joblessness and barriers to the creation of start-ups. Failure to address the development priorities of youth potentially undermines social cohesion and social reproduction (Frye and Kirsten, 2012). Without a clear intervention or an external shock, it seems rather unlikely the level of youth unemployment in Southern Africa would decrease, as employability is directly linked to education, experience and skills. Therefore, local communities must be provided with opportunities to acquiring skills thus increase employability (Ongwere et al., 2014).

We suggest that prioritization of special skills and talents among the youth communities would pave the way for (1) newly defined career paths, (2) increase the number of self-employment, as well as (3) incrementing employment opportunities.

Community empowerment initiatives in Southern Africa have been fascinatingly recorded and successfully deployed via Reconstruction Living Labs (RLabs) (Parker, Wills, & Wills, 2012). RLabs' seeks to impact, empower and reconstruct communities through innovation. Besides training and incubation services, RLabs has also established a community living-lab in Namibia. This lab strives for co-creation, open design and social innovation.

The “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.

Previous Youth engagement at RLabs

Over a one-year period, we engaged a community of unemployed youth into designing services and technological solutions for less-qualified unemployed youth. There were significant values attained when researchers engaged with participants through a combination of PD methods to trigger their social innovativeness. In turn this created a strong bond amongst the community participants and researchers throughout continuous process reflection to allow the project naturally evolving.

This project proved that engaging local communities in PD can be successful in designing generally accepted services, applications and ICTs. Currently, the youth and a number of Software Engineering students are finalizing all modules with added-on features of an ICT system. It has been co-designed with the youth; therefore the anticipated platform will be maintained by the youth that have participated in the full development cycle of the system (Ongwere et al. 2014).

Havana Project: Site History

In October 2014, a two-week intensive course under a North-South-South project funded by the Finnish Foreign Ministry was held in Windhoek. The main purpose was to equip students with skills and responsibilities of a technology designer working with local communities, thereby building local and international capacity for ICT4D.

The methodology was grounded in PD and Service Design and twenty-two students from Namibia, Botswana, South Africa and Finland formed three groups with at least one local language speaker (i.e. Oshiwambo) and diverse disciplinary backgrounds. The three groups held focus-group discussions with 15 youth in the informal settlement of Havana in Windhoek and recorded current challenges. Data captured were analyzed and categorized in issues to do with services (i.e. transport), social (i.e. crime, alcohol), amenities (i.e. water, electricity, information) and income (i.e. jobs, business opportunities). One of the groups focused on cellphone technologies to support job-finding through individual skills advertisements. They then developed a first low-fidelity paper prototype which, based on community feedback, was transformed into a high-fidelity cardboard prototype (Figure 1).

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Figure 1. High Fidelity cardboard prototype

The process and solutions were presented at the PDC 2014 in the Design Challenges session (Winschiers-Theophilus, D'Andrea, & Iversen, (2014). Major criticism centered in that the process was too much of a solution and technology-driven based on an insufficient inside in the wider context of the community. Three of the Namibian students had meanwhile developed a strong empathy for the Havana youth and decided to further pursue this endeavor. In an effort to build ICT4D capacities, local institutes can bridge skill and technical gaps in the communities thereby enhancing community innovation processes (Mushiba, Winschiers-Theophilus, Du Preez, Molokwane, & Kölhi, 2015). Thus, reflecting on our responsibilities as an academic institution that has expanded its educational grounds into communities, we made a commitment to continue the collaboration to ensure our interventions would benefit the participating community.

Up to this point in time, three researchers from Namibia have been continuously involved guiding research and development activities, as well as supervising students. Three honors level students from Namibia, three exchange master students and one PhD student from Europe have so-far participated in various sessions. Additionally, two groups of five undergraduate software engineering project students have been engaged in developing a job-matching system for the youth, as well as one other colleague in supporting logistical matters.

Havana Youth Community Context

The context as described in the following section is based on existing literature, own observations and subsequent analyses, youth participant statements, as well as newspaper articles.

With a rapidly increasing rural-urban migration, public infrastructures and services lack behind in Havana. This includes schools, roads and hygiene among others. In one of the interventions stated in (Cabrero et al., 2015), participating youth showed us the overall scarceness of electricity connections, cumbersome pre-paid access points to potable water, wastelands surrounding the housing shacks and a scarcity of hygiene resources, where public, decaying, open showers serve locals for sanitation when these function.

The majority of participants in this project migrated from other parts of Namibia seeking better income opportunities than small-scale farming in rural areas, although many survive on casual jobs and micro-businesses (Nghiulikwa, 2008) such as shebeens, barbershops,

selling second-hand clothes and cutting meat among others. We hence conclude that settling in Havana is more often than not an economical aspirational choice.

Then, “small business owners operating in the informal settlements of Havana have vowed to continue connecting power illegally as long as the City of Windhoek continues to turn a blind eye to their cry for electricity.” (Windhoek Observer, 20 February 2015). Such testimonies and others concerning evictions from illegal shelters are consistent in the local press, adding further toughness to the rural-urban venturing. Results of the above are social ills such as high crime, alcohol abuse, prostitution, besides the lack of job opportunities stressed by participants. This makes Havana to be rough, despite most interviewed youth enjoy the thriving sense of community and their friends in the area alike.

All youth participants had access or owned a cellphone ranging from old and simple cellphones to newer smartphones. Many youth also possess Facebook accounts they utilize whenever having access to the Internet, which is one of the more expensive commodities in Namibia. Ultimately, this description of the informal settlement resembles in many ways the situation in some Kenyan slums as reported by (Wyche 2015).

The Kabila Community Center is located in Havana and was our point of entry to the community. The center got established and is maintained since 2010 through the cooperation between the United Nations, the Government of The Republic of Namibia and the ELCIN church. It consists of a main building serving as both, day-care center and church. Two cargo containers serve as storage. It also hosts a small office building in the back and a small house where the caretaker lives with her family. Electricity was newly installed in the main building, yet it is unreliable and costly as anywhere else in Havana. Most of the youth engaged in the project regularly come to the center for choir practice.

Methods

Throughout the project, several distinct methods have been deployed. These follow three different research and intervention threads simultaneously: (1) Pursuing the development of useful technologies such as the job-matching system; (2) Exploring various methods for context-mapping and early design inspirations, needs, requirements and desires; (3) Venturing into action-based intervention promoting service thinking and entrepreneurial skills.

At a macro-level, we are concerned with investigating participatory approaches to unleash the youth’s potential to conceptualize and reflect upon their own living context to jointly explore social innovation design and in order to support specific implementations of services and technologies identified to support sustainable livelihood. Moreover, we have started merging results and united the distinct youth groups for different occasions and sessions.

We thus work with varying youth participants and group sizes between 6 and 20 depending on their availability and willingness to participate in specific sessions. A core group of 5, as well as one local contact were present in all sessions, with ages ranged between 16 to 35, with an often gender-balanced participation.

Technology Development Thread

This first thread describes all activities carried out towards developing a job-matching system for the youth in Havana.

Focus group discussions

The software engineering project students used a focus-group discussion to gather requirements for the job-matching software. The student groups were distributed over three youth groups complemented with the alien students. During the one-hour session lively discussions especially in the group entirely consisting of Oshiwambo speakers unfolded around current practices of jobs and worries of non-payments, and other threats of working for and with strangers. The students took notes and at times discussions were video recorded for post-situ analysis.

Software Development Sessions

Based on the focus group discussions, the students derived a system specification and developed a first hi-fi prototype during their weekly class times supervised by their lecturer involved in the project. Two groups then worked separately with different foci depending on their own judgements of priorities, social perspectives and technical abilities. Both groups divided their work and had back-end and front-end implementation roles in the group. The hour limitations dictated that each member of the group was supposed to use 120 hours in total for the course. The deliverables for both groups included the service itself and documentation of the project.

Prototype Feedback Session

Unfortunately, during the process so-far there was only one session for the students to present their prototype to the users and to then iterate their designs. We had planned more contact sessions, yet it was hampered by logistics in terms of time and transport coordination of 10+ students and 15 youth. Also the late arrival of the youth to the center shortened the time to 40min per group. The students had prepared Power Point presentations as well as functional digital prototypes which got projected onto a wall. The presentation was followed by a lively and participatory discussion with the youth.

Contextual Mapping Thread

The second thread describes all activities carried out with the purposeful intention of mapping contexts and creating early design inspirations. Indirect contextual knowledge was also acquired within the technology design and service thinking threads.

Individual Interviews

Individual interviews were held to gather information of the participants' current situation and history. This data is seen complementary to the other contextual data gathered, yet its central aim is to serve as basis for comparison of life changes over time related to the intervention, as well as comparison with the User-Created Personas (see below). Ten interviews were conducted, recorded and transcribed post-situ for further analysis. One interview took about 10-15 minutes to conduct, although there were 2 longer, over 20 minute, also included. The topic list was iterated during interview process. Interviews were conducted in different phases of the project mostly by the alien master research student.

Interviews were semi-structured and somewhat followed the structure of life history

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interview methods. (Gough, Langevang, & Namatovu, 2013) use similar methods in their research in Uganda, pointing the benefit of this approach in a better understanding of the interviewee's actions.

Walking Havana

The youth were asked to walk the researchers through the surroundings introducing locations of significance to them. Walking with participants seems a great tool for design inspirations and to understand participants' viewpoints (Bødker & Browning, 2013; Ciolfi & Petrelli, 2015). (Kanstrup, Bertelsen, & Madsen, 2015) present a systematic reflection on walking methods originating in ethnography, and distinguishing walking observation (shadowing), walking interviews, bimbling (move at a leisurely pace), proto walks and transect walks, all with a wide application across disciplines. We aimed to "explore the surroundings through the eyes of the youth", utilize recordings for post-situ analysis, and the co-creation of a movie. The guiding youth were overly ambitious in showing "the real life in Havana", emphasizing mostly on their concerns like schooling in tents, shared toilets and showers in public spaces, water collection points, scarce electricity connections, huge wastelands polluting the surroundings, and extensive alcohol consumptions throughout the day.

Figure 2. Walking Havana

User-Created Personas

The youth were tasked to create personas to describe a set of typical actors characterizing Havana. An analogy to "actors" in a movie was made, considering that it was agreed that alongside all the activities undertaken with the youth a movie would be co-created. Since persona is a surrogate of a group of users sharing commonalities about needs, requirements and aspirations to do with technology and there is the proposal of technology development in this project, we consider this method suitable for this and to transfer insights from real life settings into the personas themselves.

Figure 3. Users creating Personas

The youth hence were split in to 2 groups of 4 participants and provided with A0 paper alongside with markers, magazines and other materials. (Cabrero et al. 2015) has documented the process and findings further in detail, concluding that these User-Created Personas have shown to be a successful method to engage the youth in self-reflection and description and in context modeling.

Context-Mapping Session

A context mapping session was conducted to understand the current situation of Havana followed by "future Havana" development. Sixteen participants were split in 2 groups provided with markers, pens, Sticky-Notes™ and A1 paper. One group consisted of children and teens was facilitated by a researcher, while the other group were older participants, some with genuine interest in entrepreneurship, and no one facilitated them.

One of the carrying themes of the session was to plan the future of the community center. There is hope that in the near future the community center can develop to e.g. offer some courses and access to computers and the Internet.

To manage false expectations accordingly, it was made clear to the participants that they would have to do the plans and do the fund-raising themselves, and that the research team will be playing a facilitating role only.

Service Thinking Thread

The Havana Entrepreneur

The "Havana Entrepreneur" was designed following the model of the famous TV-reality show "The Apprentice" with Donald Trump in the US and Alan Sugar in the UK. Youth got divided in 2 groups "competing" against each other throughout 4 pre-defined challenges. For each challenge the groups were given a planning and strategizing phase, and a week later an execution phase of 2 hours each occurred. After each challenge was completed, groups presented results and got judged by the research team using a set of score categories corresponding with the anticipated skills to be learned.

Besides, all activities got filmed by a researcher or a youth team member alike towards the eventual production of a reality-show - "The Havana Entrepreneur". One aim here is to train youth interested in filmmaking on the side, considering that one of the project

members is a professional filmmaker.

The group composition and size varied depending on the youths' commitment and a reshuffling as prescribed by the rules of the game. The weekly challenges were as follows:

- Business plan for their own youth community center;
- Selling second-hand clothes on the street;
- Developing novel products out of recycled materials;
- Taking tourists for an informal settlement tour through Havana.


Figure 4 & 5. Business plan development and clothes selling

Figures 6 & 7. Recycled material production & tourist pamphlet design

Challenges were real-life activities with the aims stated above in mind. They were developed further in collaboration with the Namibian Business Innovation Institute.

Money earned through selling clothes and tours was divided among the participants, and the final outcomes are currently being inspected for suitability in undergoing a full innovation process.

Outcomes and Reflection

In this section we will present outcomes and reflections, as relevant to our discussion, structured by threads followed by a general project reflection.

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Technology Development Thread

Outcomes

In the design of the job-matching systems a number of distinct factors were considered such as the nature of the jobs (casual, blue and pink collar), the process of matching employer with jobseeker in terms of trust, recommendation and skill marketing, as well as the differences in technology access. Most debates with the youth and among developers centered round trustworthiness and how to ensure all parties are saved and serviced.

In the current prototypes a symmetric ranking system was implemented which only allows after a job was done for the employer and the employee to rank each other. The payment is currently done off-line (as in Namibia many youth do not have a bank account and credit card payment is not widely supported) yet with agreements between the parties recorded on the system for tracing purpose. Enforcing or prescribing minimal wages was thought about. The inequality of technology access was covered through technical solutions communicating with the system via text messages on low end phones, smart phone app forms as well as a website for more comfortable navigation.
The user-developer interactions can be considered suboptimal having created a communication gap leading to a loss of interest by the youth, which needs to be restored in the next phase with more professional sessions.

Reflection

In terms of novelty, the idea of a symmetric ranking of both parties was based on meanwhile well-established asymmetric on-line reviews of services, such as hotels, restaurants, e-bay etc. Although a lot of questions were asked around the honesty and the possible abuse of such a mechanism and who should have access to how much information of the review, we believe that only once in use will we be able to see the effects. Another worthwhile idea to pursue is the trust in “friends” recommendations thus we intend to overlay the system with a social network application.
Although the students were performing well in the original requirement gathering phase, they quickly overwhelmed the youth with the use of technical terms, assumptions on technologies and process flow knowledge which led to a communication gap. Their current curriculum does not emphasize user-developer interactions sufficiently on a practical basis. Thus as much as we want to promote a real-life learning experience for the students we need to ensure a workable collaboration with the community.
The development of the system has uncovered many issues, such as trust, payments, change in communication media and styles, digital marketing of one self (in the absence of sophisticated Curriculum Vitae’s) which on the one hand demonstrates major weaknesses of fairness and safety in the current job practices but also the complexity of such a technology to be designed and introduced. If the system is just an extension or improvement of current practices the general situation of casual workers and unemployed will not change. Especially that most of the informants reported a steady income to be one of the most desired goals, seen as a key to give a better life for themselves and their future children.
What seems to be required is a radical innovation design affecting the wider established field of the job market. This is beyond our current ability, considering that the youth as well as we with a dominant technical background have not sufficiently engaged in approaching the issue with a radical “out of the box” approach.

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Contextual Mapping Thread

Outcome

Triangulating individual interviews, with walks, user-created personas and youth group context mapping led to a comprehensive insight into the situation which was incorporated into the above section describing the youth community context.

The individual stories gave accounts of a rather content nature with the youth having found their way around many of the socio-economic challenges encountered. On the other hand, the walking and persona creation revealed us the darker side of Havana, elucidating infrastructural and social issues negatively affecting the fulfilment of physiological and safety needs of the individuals. During the walking session we encountered intoxicated people, children playing in unhealthy environments and were told about the crime problems that the area has. The personas created portrayed prostitutes and gang members. These workshops balanced the perception of the life in Havana from the individual interviews. The context-mapping session confirmed the issues gathered in the other sessions. Thus the “future Havana” session focused on achievable goals such as the establishment of an independent youth center with an emphasis on training and self-sustainability. The need for computers with Internet connections was articulated very clearly. Major discussions around security and operations unfolded. Ideas of containers, proximity to the police station and security guards were proposed.

Reflection

While the information gathered has led to a rather comprehensive contextual understanding of the community we intend to verify the accuracy of each data set and interpretations thereof to be validated in further discussions with the youth. For example the timing within the project as well as interview language might have altered the expression of certain viewpoints yet not the factual information. Also those who were willing to be interviewed were mostly the participants who were more active, connected and better off. We recorded, similar to the findings with the other youth site, a general striving and willingness to contribute to the common good and the youth in particular rather than individual strivings. Concerning the impressions and information gathered as a basis for design inspirations only future interventions and joint co-design of technology and service innovations will tell, considering the complexity of the context within its own transformation process with inside and outside influences.

Service Thinking Thread

Outcome

The Havana Entrepreneur workshops revealed the strengths and the weaknesses of the Havana youth’s entrepreneurial skills. The most problematic session was the drawing up of a business plan, which is a rather complex and abstract endeavor. It was not fully understood by one of the groups, while the other group had two experienced entrepreneurs as members, which created a huge difference in the scores. The losing team was deeply ashamed and first requested all recordings to be deleted or at least anonymized, yet it sparked a competitive edge in the group members ensuring their winning compared to the other group in the proceeding event, namely in the selling exercise. Although their planning and preparations were weak, they compensated for it in

the street by convincing marketing and persuasion. Overall the planning phases for the tasks were harder for the participants than the executive phases. For the recycled product creation event, the participants came well prepared with material and ideas. A number of interesting products were produced such as a strong rope weaved out of plastic bags, a bag out of cardboard, and table mats made out of empty pens. The planning of the tourist tour was well framed through the development of a pamphlet by the group members. However the tours themselves only vaguely overlapped with the planned excursions but were rather improvised. The tourists, consisting of visiting European consultants and interns as well as a few local colleagues who had never been in Havana, appreciated the "authenticity" and spontaneity making it a unique experience.

Reflection
This set of interventions seemed to be the most rewarding in terms of reciprocity, livelihood and immediate tangible and visible results. Beside the reality movie which is currently in production, the youth continued their endeavor of setting up a youth community center in conjunction with the Namibian Business Innovation Institute. The Havana youth started attending Rlabs trainings in town.
The participants who were committed to attend most challenges showed a lot of improvement in their skills. With time, the planning sessions got more effective and efficient. It is also worth noting that the most of the improvement happened in the group that had the least prior experience. In the first challenges they had real problems generating a business plan compared to the group that had more senior members, but with enthusiastic attitude the skill gap was closed quickly.

Cross-cutting Reflections

Technology Adoption and Maintenance
From this point on, the technology adaptation becomes a critical factor when determining how successful this project will be as a technology intervention. If the service is not adapted, the effects will stay limited mostly to the participants of the process and not affect the wider community around it. However, as (Bossen, Dindler, & Iversen, 2010) suggest, we have established networks of people in the community. The participants of our project seemed to have good connections across the community in Havana and thus can spread the solution further in the area.

Student Involvement
For the software engineering project students whose main task was to create the web & mobile service this was a "construction project" where the focus was on the end project given a limited time. Thus the students in these groups did not have enough time to use participatory design methods in full extend. For the research students, it was the opposite. The differences in approaches made it more difficult to unify the goals as well as the youth groups participating. The current post graduate students have committed to continue their engagement with the Havana youth pursuing their next qualification thereby ensuring continuity. From a documentation perspective the developer students did not document the focus groups or feedback session beyond what they have incorporated in their official software specification documents, while the postgraduate students are required to produce comprehensive documentation in form of a thesis. Thus handing over of results and

findings should be incorporated into the developers' documentation. Currently one of the developers has been recruited as University intern to complete the development process. We have adopted this model for a number of incomplete projects thereby ensuring deployment to the users.

Youth Involvement

Participants recruitment was relying on the community youth mediator which organized the gatherings. Thus only a selective group of youth was informed, the once who were reachable via phone mostly and not the most desperate once. None of the youth seemed to engage in alcohol abuse or illegal activities but were committed Christians regularly going to church.

A challenge was the lack of continuity. Although everyone involved agreed to the workshops dates in prior, only a subset came yet different youth also continuously joined. Thus planned sessions had to be reshuffled at times accommodating the present participants. No shows were critical in the individual interviews. Punctuality was one of the biggest annoyances in terms of logistics and number of students and researchers involved. In general the activities started an hour later than the agreed starting time was. This was especially problematic in the tourist tour where the tourists waited for the guides.

A review of ICTD goals in the local context

In this section we derive a number of directives based on our experiences and the literature toward fostering different goals in ICTD. Although the suggestions might not be novel, our intent is to promote a wider rethinking of values and intentions in ICTD, considering the potential of local actors.

Bridging the technology design gap

In both youth engagement projects the youth were able to creatively model their context, visualize a better future yet the design of the solutions were standard and only presented slight improvements. Although smart phones are already present in the community, the users lack the skills to conceptualize and develop new and relevant applications. Similar results were obtained by (Steyn et al. 2013) who conclude that in order to "truly innovate ICT" and services, the participants should be equipped with much deeper knowledge of ICT. It could be argued however that computer expertise does not necessarily lead to innovative solutions as many of the computer science and informatics education and training still promote a traditional technology solution driven approach, rather than an innovative service design approach. While we are promoting a community driven ICT innovation process in theory, we do need to acknowledge that user-driven software development is still in its infancy even in more technology savvy societies. Thus at this point we suggest exploring approaches such as technology and mobile probes (Graham & Rouncefield, 2008) and early introduction of technology prototypes in the community co-design process to trigger innovative ideas within the joint effort. We have recorded a number of successful designs in our previous work with rural communities in Namibia. Thus we consider the current solution as an early prototype to evolve and get innovated within the context of use.

Reframing outcomes

Many at times while being focused on the technology and the solution of a defined

problem we overlook the “side effects” of our interactions. Especially in participatory interventions and long-term engagements many more human aspects become relevant. While the literature has focused on designers’ perspectives such as “gaining the communities trust”, little has been published from a communities’ viewpoint. Both youth engagement projects have shown us the significance of human developments within the project. Naturally working with the youth can become a life changing event for these young people in their formative phase of life. In the Rlab youth project the idea of Self-actualization as the guiding principle of actions in the process of once ones and others life improvement has been a central and explicit theme. Increased self-esteem was one of the often expressed results of the interactions and co-design process. Similar “side- effects” were recorded by (Kapuire et al. 2015) among elders in rural Namibia who had been co-designing technologies. We consider that a person with high self-esteem in a community context has the potential to take action towards a common good. Thus within a technology co-design project not only the technology should be evaluated but also the human development alongside.

Expanding Engagements

Failures of sustainability across ICTD projects have often been attributed to the lack of local capacity to develop and maintain the technologies. Thus an important component of ICTD should be knowledge transfer. We realize that often students who are introduced to the community are ill-equipped in terms of communication strategies and on a methodological level. Theoretical courses have shown to be ineffective in transferring the needed skills. Thus community-based action-research oriented education by local institutes seems most promising. In both youth projects reported above have we recorded a steep learning curve by the students yet a reduced community impact. Similar results were pointed out by (Mushiba et al. 2015) who appeals academia to ensure equal benefits for the students and the communities by formalizing the partnership. We especially encourage long-term partnerships beyond defined project times, as often the technology adoption and the change management after the development and deployment of technologies needs require external resources. Long term partnerships with selected communities can enable those same communities to become change agents for other communities with similar challenges.

Conclusion

In this paper we discussed an initiative in which we used participatory action research within the discourse of social embeddedness. Using this methodology as an initiative to empower youth enabled us to not only develop useful technologies, but also promote entrepreneurial skills among the youth participants. Our results show that participatory design is a promising approach to unleashing young people’s potential to conceptualize and reflect their own context. While initiatives such as those in the first ICTD era look at bridging a digital divide in order to enable the global south to participate in ICT innovation practices, they conflict with the view that ICT is the savior to facilitate development, and the notion of development as defined by the global north (Avgerou 2010). The participatory design approach gives us the opportunity to endorse locally situated interactions to contribute towards changes as determined by the local actors, which might or might not

include ICT's. Knowing that ICTs are pervasive and ubiquitous, technology adoption nearly seems unavoidable and natural. Our design experience with youth enabled us to realize that in order to attain the enormous potential from any ICTD projects, there is a great need to close the technology design gap through responsible community engagement while focusing on the potential of local actors which are revealed through the co-design process.

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