

Articles

Collective Digital Storytelling in Community-based Co-design Projects: an Emergent Approach

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This paper contributes a critical examination of the role that digital storytelling (DST) can play in co-design initiatives involving local underserved communities. We argue that DST brings value as a method for bridging initial, exploratory phases and co-design processes. The paper draws on three case studies of collective DST in two townships of Cape Town, South Africa. The research adopted a participatory ethnographic approach to involve groups socially active in their respective communities. DST was employed initially as a means to enable groups to present themselves and their communities and to deepen the ongoing process of data generation. During the creative processes, the activities evolved and crystallized into something more than a short video production: self-contained and community-driven projects, generation of new ideas and the development of new collaboration pathways and new digital networking capabilities. Through the analysis of these case studies the article advances considerations that can be used by researchers and practitioners looking to spur grassroots initiatives and encourage local participation and engagement in community-based co-design. In

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particular, we offer a series of design principles, proposed as sensitising concepts that can inspire and guide researchers and designers, or local communities, to engage in DST activities within community co-design projects.

Introduction

The participatory design and co-design literatures acknowledge the issues posed by community engagement in design, in particularly in the case of rural, disadvantaged, or socially and informationally isolated and marginalised communities (Sabiescu et al., 2014; David et al. 2013). Issues include wide knowledge gaps between external teams of researchers and designers and local communities; tensions between different epistemologies and meaning-making systems (Sabiescu and Memarovic, 2013); members' low perceived self-efficacy in their own capacity to make meaningful contributions; difficulty of reaching communal consensus on the role and features of artefacts to be developed; the lack of effectiveness of established co-design methodologies (Winschiers, 2006); and the time required to work through new, community-grounded design methods that can spur participation and meaningful contribution. In this article, we argue that some of these challenges can be met by involving local communities in activities that provide opportunities to engage analytically, critically, reflectively and creatively with their environments, livelihoods and knowledges. In particular, we examine the possibilities offered by digital storytelling (DST) as an activity that can bridge initial, exploratory phases, and possible future design activities in community-based co-creative projects. DST presents the potential to engage participants in an exploration of their environment (Sabiescu, 2013; Sabiescu et al., 2013) and their personal stories – often disclosed thanks to the sense of protection offered by the distancing mechanism of the digital device (Clarke et al. 2013). It enables participants to elicit meaning from experience and enhance their capacity for interpretation of their life and socio-cultural context (Klaebe and Foth, 2006; Copeland, 2012). For its capacity to be used as a tool for inclusiveness and to accommodate a variety of local voices (Copeland, 2012), DST is particularly rewarding when employed in underserved, disadvantaged and informationally isolated communities. For these types of communities, the benefits of DST are recognised, potentially allowing their members to voice their views and take effect in achieving social change or wider social and political participation (Tacchi, 2009).

In this paper, we propose that these qualities of DST can be exploited to employ it as a tool for facilitating the involvement of local communities in the co-design of digital artefacts and technologies. In particular, we draw attention to the importance of the DST method used for community involvement. The methods used can affect the dynamics generated during story creation activities, the types of stories that are told, and eventually the impacts on participants. Several methods, such as the one developed by the Centre for Digital Storytelling (Lambert, 2013) achieved recognition and were used and adapted in numerous other contexts. In this paper, we take a different approach, characterised by *emergence*, referring to the process by which the design of the creative activities is shaped in interaction between the field researchers, designers and local

participants, guided by events, decisions and participants' constant inputs. In this perspective, the DST method is not pre-defined but grows organically during the creative process, leading to context-specific ways of engagement, processes and activities. We argue that this emergent approach contributes to opening up local interest, involvement and creative input in the framing of technology design interventions, and thus has the capacity to lead to more engaged collective participation in subsequent co-design activities.

The paper draws on a more extensive research project run by the University of Cape Town in South Africa that examined the role of digital technologies for supporting collective agency and empowerment in underserved communities. The project included an initial exploratory phase that looked at local mechanisms for empowerment and collective action and patterns in technology use at individual and group level. In the second phase, local stakeholders were involved in the co-design of digital artefacts that could capitalise upon and reinforce already existing mechanisms for collective empowerment and action identified during the initial phase. Collective DST was used as a bridge between the two phases: the initial phase focused on exploration through qualitative and ethnographic methods, and the subsequent co-design activities that unfolded thanks to the intermediate DST creative activities. Three DST initiatives were run, involving several groups located in two townships of Cape Town, South Africa. In this article, we examine the collective DST processes in the three cases and their role in the design continuum, to answer the question: *To what extent and how can DST contribute to stimulating and building capacity for purposeful community participation in co-design initiatives?*

Our main interest in investigating the cases to answer this question is methodological: we intend to shed light on how the approach and method used in DST with communities is conducive to enhanced community participation. Thus, this paper's main contribution to scholarship is outlining an approach to using DST in community-based design, characterised by emergence: an amethodical approach (Truex et al., 2000) guided by participants' inputs, where events and decisions unfold and drive the process. Despite its unplanned nature, some characteristics of this approach emerge from the cases showing a way of collaborating supportive of an engaged participation. The analysis of three cases in which DST has been used as a co-creative activity highlights how DST can strengthen collective sensemaking, support the generation of new ideas, foster group networking, and stimulate empowered participation and contribution in the design process. Our analysis identified a series of flexible, broad-based elements that can guide researchers, designers and communities seeking to put in practice DST activities. We propose these as design principles, positioned at a higher level of abstraction than design guidelines, which are meant to orient rather than guide design processes, and draw the attention of the designer to the possibilities opened and the constraints posed by adopting a certain frame or approach (Hornecker et al., 2007; Sharp et al., 2007). These principles can help researchers working with technology in place-based community settings to facilitate bottom-up "grassroots" ideas and design that foster trust and engagement within the collaborating team.

Related work

Enhancing participation in underserved communities: From design methods and workflows to emergence and co-creation

Community participation in design has received a great deal of scholarship attention, especially when framed by community development agendas. Local participation is seen as an essential condition for successful community-based interventions (Wyche, 2015; Sabiescu et al., 2014; Winschiers-Theophilus et al., 2010; Rodil et al., 2012) and positively associated with a range of other impacts such as greater sense of local ownership (Rey-Moreno et al., 2015a) and acceptability of externally initiated programmes (Rey-Moreno et al., 2015b). The idea of participation, however, hides a multitude of forms, scales and degrees of involvement (see for instance the scales developed by Arnstein, 1969; Kanji and Greenwood, 2001). More recent approaches hold that rather than striving to improve engagement methods, it is important to create the space and conditions for participation forms and modalities to emerge and be co-created in the field with communities, emulating local ways of thinking and traditional patterns of decision-making and communication (Sabiescu et al., 2014; Winschiers-Theophilus et al., 2010).

This drives attention to the early stages of the design continuum, when community priorities and design problems are identified and potential technology uses are examined or configured. Challenges at this stage include the difficulty of establishing dialogue and rapport with design teams due to knowledge gaps and different vocabularies (Sabiescu and Memarovic, 2013), identifying collective matters and priorities, and reaching collective agreement and community consensus of decisions taken (Sabiescu, 2013). The body of research focused on identifying and overcoming barriers to local participation in design draws on different traditions. Baskerville and Myers (2015) suggest the design ethnography approach: the ethnographer, while working to understand the local context, acts as well as a designer who gets engaged with the reality and introduces concepts and sometimes artefacts to stimulate interest and foster knowledge exchanges with participants. Reflective design is another critical tradition, which argues that some of the barriers to effective design are to be found in researchers' deeply held assumptions and predetermined ideas and conceptions. By supporting researchers to reflect on their assumptions, observe their actions, and make meaning out of their experiences, some of these assumptions can be revealed and articulated, leading to more transparent and egalitarian processes (Sengers et al., 2005).

An examination of the literature reveals that these approaches are usually applied in creative ways, seeking to maximize relevance for a local context (e.g. Crabtree et al., 2003; Graham et al., 2007). Moreover, as argued earlier in this section, the critical point may lie not in the configuration of the right design tools and methods but rather in devising ways of engaging communities in the formulation of their own methods for informed participation in design (Sabiescu et al., 2014; Winschiers-Theophilus et al., 2010). This approach moves the focus in participatory design from methods and tools to catering for the enabling conditions. This suggests an open, emergent process, which

privileges community agency in a way that cannot be afforded by predefined methods of engagement.

These frameworks and approaches resonate with the amethodical approach described by Truex et al. (2000) for information systems design. An amethodical design approach resides on “an open set of attributes” which, though potentially rejecting structure, “does not imply anarchy or chaos” (Truex et al., 2000, p.54). When applied to information systems design, amethodical approaches refer to “management and orchestration of systems development without a predefined sequence, control, rationality, or claims to universality. An amethodical development activity is so unique and unpredictable for each information systems requirement that even the criteria of contingent development methods are irrelevant” (Ibid.).

In this paper, we further this line of thought, examining how the principles of emergence and amethodical approaches to design resonate with DST initiatives that do not employ predefined methods but are configured locally, through the agency of community members. The situated case studies will show how this approach allows creative processes to unfold in directions that are not pre-determined and opens space for different perspectives and understandings to be clarified (Truex et al., 2000). Openness, appropriateness, flexibility and situatedness will be shown to be central to the stimulation of local participation, without being in contrast with the important attributes of legitimacy, rationality and efficacy (Ciborra, 1996).

Digital storytelling as creative practice and data generation methodology

DST is a form of creative practice that makes use of digital media for telling or authoring stories. Recent studies experimented with the use of DST as a research method, leveraging its potential to engage participants in an in-depth exploration of their experiences that can eventually lead to the elicitation of rich data sets (Sabiescu et al., 2013). In this paper, we argue that the potential of DST for community engagement in design draws on its dual status as both a form of creative practice and a method for data generation.

DST as creative practice has been studied in a variety of contexts, ranging from education (Yuksel et al. 2011), gender (Simsek, 2012), health (Gubrium et al., 2014), and co-creative media (Spurgeon et al., 2009), to social history (Klaebe et al., 2007) and therapy group work (Clarke et al., 2013). Studies examining the benefits of DST as creative practice indicate that it contributes to generating knowledge framed by local perspectives (Gubrium, 2009), enhances participants’ capacity for interpretation of their life and socio-cultural context (Klaebe and Foth, 2006; Copeland, 2012), can serve to develop new perspectives for looking at participants’ own environment (Miskelly et al., 2005), and can allow the articulation and representation of local identity and culture especially in the context of marginalised or minority groups (Williams et al., 2003) or by groups with limited or no media literacy (Nutt and Schwartz, 2008).

As different from DST as creative practice, DST as research methodology is designed as a primary source of data relevant for research purposes. The core area investigated

becomes therefore the key subject around which participants will craft their stories. Data can be retrieved from (1) analysing the digital stories produced by participants in a study, (2) analysing the process of producing the stories and the input provided by participants at each stage (Gubrium, 2009), and (3) using the digital stories as a stimulation for further discussion and reflection when visualised in a group. In addition, DST-based data collection can be complemented by other data collection instruments, such as ethnographic observation, in-depth interviews and focus groups.

Recent studies indicate that DST can be used as an effective tool to elicit a holistic understanding of participants' perception of everyday life. Topics such as health (Gubrium, 2009), allow the articulation of collective concerns and issues by communities (Gubrium and Scott, 2010), and afford an in-depth investigation of participants' lives in sensitive contexts such as those of immigrant groups (Rose and Granger, 2010) or groups living in underserved communities where the legacy of the historical background is still at the base of social inequalities, like in the cases presented.

In this article, we draw upon a joint perspective that sees DST as both creative practice and data generation method. We focus on collective DST, involving the authoring of one creative story by a group of people who work together to decide what to do, how to collaborate, to establish the main message to deliver, and to revise their work. Collective (also termed collaborative, or cooperative) DST has been used in the past particularly in educational settings, where whole classes of children created digital narratives (e.g. Di Blas et al., 2012). However, collective DST is currently under-explored in the literature, in particular in underrepresented and underserved communities (McWilliam, 2009). Our approach to instantiating collective DST privileges emergence and community agency, in the spirit of the amethodical systems development approach described by Truex and colleagues (2000). It also draws on this double-edged approach, which sees DST as a creative activity and a means of generating research data. In the cases presented, DST was used as a data generation method in addition to interviews and focus groups. During the phases of DST creations, the research focus was on the process rather than the product, therefore directing the attention to the structure and flow of activities, ways of engagement and collaboration, use of different tools and techniques, and participants' response to these. The field researcher, a participant observant throughout DST activities, took detailed field notes, which were later analysed.

Context

This paper draws on a larger study conducted by the University of Cape Town, 'The impact of mobile technology and public access on collective empowerment among the urban poor'. The project aimed to examine the technological encounters and experiences of people living in underserved urban settlements and involve them in the co-design of novel technologies that could leverage and strengthen collective capabilities and empowerment.



Figure 1 - Overall research context and setting.

The first phase of the project was an exploratory phase in which interviews and focus groups were conducted in several communities around Cape Town, mainly in two of the biggest townships of South Africa: Philippi and Khayelitsha (Figure 1). Both are part of the former Black Local Authority areas and more than 90% of the population is still Black Africans. The townships are designated areas of the city where a number of informal settlements exist and are growing, and where communities face a shortage of basic amenities and services: sewage, electricity, roads, and clean water (Jaglin, 2008). Half the population, more than half a million people between Philippi and Khayelitsha, lives under the poverty line (City of Cape Town Census, 2016).

The participants in this research are groups of women, the majority in the range age of 25 to 60, mainly Xhosa mothers - Mamas, as everybody refers to them colloquially, and groups of Youth, between 18 and 25 years old. The study and fieldwork were conducted by a researcher with an extensive experience as project manager coordinating a series of activities for mobilization around HIV-AIDS (prevention, treatments and stigma), the protection of women victims of violence, and counselling on alcohol and drugs. Her personal knowledge and connections allowed her to participate in some of the daily activities of the groups and to verify the possibilities to develop some projects without providing any incentive or remuneration for the participants.

Six groups of Mamas and five groups of Youth took part in the exploratory phase through interviews and focus groups. During this phase, the majority of the groups showed a limited knowledge and scarce skills and interest in Information and Communication Technologies - ICTs (Lorini et al., 2014a). Some of the groups, however, expressed a specific interest and capabilities in the use of technologies required to reach a specific aim. Two Youth groups emphasized the possibilities that technologies could offer them to showcase their artistic products while another group hypothesised if the use of modern communication media could find funds to support their ongoing activities. Each of those groups decided to engage in a DST experience and discuss further possibilities to develop community projects. Following these leads, the researcher proposed the creation of DST also to a group of Mamas, to support a more thorough presentation of their group's activities and as a trial for the use of creative ICTs.

Case studies

In this section, we introduce three DST case studies, involving overall six of the groups previously interviewed in the project exploration phase. The first DST had been created by a community radio station group, the second one by a hip-hop group jointly with a group of poets and a marimba group, and the third by two groups of Mamas active against gender-based violence. In each case, the DST process was documented by the field researcher through participant observation, informal talking and taking detailed field notes. For each case study we describe the group or groups involved, the overall DST process, and its outcome. A summary of findings is presented at the end of this section.



Figure 2 - Community radio station setting.

The community radio station – A documentary

One of the Youth groups active in Samora Machel, a neglected and overcrowded area of the township of Philippi, over the years became stronger and more organised and created a community radio station. Their main concern was to address the local need to have community radio stations, knowing their limited presence in Cape Town (Olorunnisola, 2002). The station is based in the area's community centre (Figure 2). The youth group works on a voluntary base to offer what they consider a needed service in their community: to inform, to educate and to motivate people. The name of the radio station is "Iqhayiya," meaning "Pride and Joy" in Xhosa: the radio station has been created to highlight the importance of the local culture and to add an element of positivity in the community.

Most of the youth involved are unemployed and only active in the community radio station. The journalists use their personal phones for information search: simple smartphones where they can access the news in English and translate them in Xhosa, the language spoken by 90% of the population of Philippi and the surrounding townships.

At the beginning of 2014 the field researcher met the representatives of this youth group and conducted a focus group. The interaction revealed their desire to create a community radio station for Samora Machel operating from the community centre. In a

second step, after the installation of a rudimentary radio station in July 2014, one of the founders contacted the field researcher in order to discuss opportunities for collaboration, in particular on how to introduce themselves and their project to any possible funder. Having already written some letters and a brief history of their venture, they evaluated the possibility to utilise pictures and an engaging media format to show their early achievements, and plans for expansion, to potential funders and supporters. This marked the beginning of the DST process, elaborated in the course of October 2014.

The DST Process

Once the group decided to create a fundraising video for the radio station project, the researcher acted as a facilitator during a series of meetings and workshops at the community centre, to facilitate the emergence of the concepts they wanted to express and start the design of a coherent and meaningful story. Initially, only the aim of the video was clear and shared between the participants. As a first step to draw the story line, members were requested to express and write their main desires and ideas about the radio station, independently from the role played at the radio station as director, technician, journalist or funder. The second step was to evaluate and prioritise the features and messages to be conveyed, aiming to reach group consensus on a series of key messages to put forth in the digital story. The key features that met consensus included a presentation of the radio station listeners, the community, their area of residency and base of the radio station, and the main reason of existence of the project itself (i.e., the clear perception of the necessity of the service they are offering).

To show the importance of the listeners not as buyers of a product but more as inspiration and motivation, the group decided to interview some elderly and younger members of the community, both representative of their supporters and target audiences for specific programs. The group members asked the researcher to be present during the interviews to show the transparency of the process and to prove the impact of their project after only few months of being on-air: the community as a whole was supporting the radio station. Later in the process of gathering content for the video, the youth decided to include a snapshot of the community. The researcher was also asked to participate in a community tour to take pictures and videos.

The following steps of the video composition took place with the main founders of the radio station. One member was collecting the interviews to try to elaborate them on her personal laptop while another member was collecting images on a tablet. While selecting, they asked to compare their videos with the ones taken by the researcher at the same time, and expressed a preference for using the material shot by the researcher. To define the flow of the story, the whole group was involved in evaluating the interviews taken. Agreement was reached that rather than narrating their community radio station story and aims in their own words, they would instead feature the interviewees who expressed the role of the community radio station from their own points of view.

While watching the videos of the interviews to select the sections to use for the DST, the group felt rewarded by the results and became even more conscious about the impact of the radio station programmes, as they were summarised by their listeners. The members decided to use the shoots recorded inside the radio station to showcase their daily activities and introduce the people who work there as opening and closure of the video. The researcher gave to the designated person, a young woman working as technician at the radio who was studying computer science, all the videos that needed to be edited on the basis of the collective decisions taken regarding the flow of the story. Because the group chose to use only videos with audio incorporated and not photos, the technician admitted that the resulting editing process was quite fast.

DST Outcome

The result of the DST activities is a documentary that introduces the community where the radio station is located, the founders and creators of the project, the different categories of listeners, the different meanings the project has for the community and their vision for the future. The group would have liked to utilise the video as a presentation tool for possible partners and funders of the radio station. The creation of the DST generated further interest in the possibility of developing another co-design project that could increase the visibility of the radio station and its outreach. The follow up activities, creating a website for the radio station with the possibility to broadcast live or on streaming and to use a mobile application for outside broadcasting, took place during the course of 2015. The DST final product became of secondary importance; the DST process on the other hand fostered the generation of new ideas and allowed the sourcing of useful data on the radio station organizers. The DST process pushed the radio station team to successfully work collectively and to interact directly with the listeners and the community, using also images and videos; this created a keen interest in incorporating different communication media with the work of the analogue radio station.

Hip Hop, marimba and poetry - More than a music video

Another Youth group that showed a specific interest in the creation of digital stories is Street Revolution. All members live in Philippi and have known each other for years. In 2014, they were between 16 and 25 years old. The founders of the group are the stable members, but wider, even temporary participation is encouraged. As with many youth groups, they gather in order to develop their passions, in their case, hip hop music. Over the years, this group, together with others in the area, collaborated with some non-governmental organizations (NGOs) to receive support for their artistic activities and also to create cohesion and prevention activities on social issues (HIV-AIDS, violence, drugs) spreading inspiring messages through art. The activities centred on peer-to-peer education with an edutainment (education through entertainment) approach.

At the beginning of 2014, group members participated in the exploratory phase of the research project via interviews and focus groups. Through this process emerged potential uses of ICTs reflecting the groups' passion for music and concern for their communities. The researchers kept in contact with them, developing a discussion about

the possibilities for the local artists to develop their potential and eventually find opportunities in their field of interest. The initial idea was to produce a CD and raise funds through it. Considering the costs of recording and the limited availability of recording studios in the community, the hip hop group and the main researcher decided to create a video of their performance to showcase their art to some producers as well as to places where they could perform live. The day the researcher went to the community to develop the idea, towards the end of 2014, other youth were present: a group of marimba performers (marimba is one of the traditional South African instruments) that had already participated in the exploratory phase of the research, and a representative of a group of poets of the neighbouring community, Nyanga.

The DST Process

The hip hop group explained that they invited the other groups to perform together and showcase a representation of the collaboration between different groups, in particular a traditional group of musicians and a modern group of hip hop artists supported by a poet who could add more value to the message they wanted to deliver. None of the participants, included the leading group, had a clear idea about the story flow. They wanted to perform, possibly improvising together, and to see how the video of the collaboration would look like as a presentation of their potential. The marimba group prepared their instruments on the backyard of the shacks where they live and practice. As soon as the musicians started playing, the poet began performing followed by one of the hip hop artists. Another member was recording (Figure 3).

After listening to the recorded performance, the team decided to record the different parts (sounds and words) separately, to obtain a better quality of the audio. The marimba music would become the base for the future video. The researcher, who until that moment was a participant observer, asked for an explanation of the message that the groups were trying to convey through the video; the artists were performing in their traditional language that the researcher could not understand. The request evolved into a suggestion to elaborate further on the message considering that the production was improvised. Every group, separately, was given block notes and pens in order to write what they wanted to see in the final story.



Figure 3 - The Hip-hop and marimbas jam session.

The marimba players and the hip hop artists prepared a presentation about their respective groups. The poet, once she heard that the talks were in English and not in the traditional language as per their previous performance, decided to compose a new poem for the video. She chose not to introduce herself personally but only to let the poem express her feelings. In the following days, after hearing the new poem, the musicians decided to change their presentations completely to relate to it: a poem about the fight of the youth for their rights, their activism, and the dangers of empty promises. Once ready with the presentations, they recorded their voices when they were all together, so that everyone could hear the message of the others. The exercise was repeated several times because each group tried to maintain the structure similar to the other group, to talk for the same time and to use words and expressions that could generate an easy connection between them. Once the two groups were satisfied with their respective introduction, they recorded on a digital device a short explanation of the collaboration.

The title of the video was created during a brainstorming activity on themes that emerged in the poem and in the artists presentations focused on 'change'. Everybody wrote recurring words and terms that could summarize emerging concepts as well as their main initial goal in collaborating between different groups ('chain'). They then asked the support of people in the community to draw the concept and to find a picture representative of their message to use at the beginning of the video. Every group decided to select pictures from their past exhibitions to be uploaded to the video and they collectively added pictures of events occasionally performed together. After the storyline was finalized and written on a notebook, the collected images were sent to one of the members of Street Revolution who used the computer of a local NGO to compose the video. A specific software was installed on that computer and the artist participated in a video creation training to learn how to merge videos with audio or images, to separate audio, and to add different lines of sound for words and music. This knowledge was needed to well present the NGO programs. While the poet and the marimba band players had very limited skills and showed little interest in the technical aspects of the project, on the other hand, while viewing the final product, a number of the hip hop artists expressed their enthusiasm and their wish to learn this new medium.

The DST Outcome

The title of the story - "Chain for Change" - emerged in group discussions and was accepted through collective consensus. This was an interesting moment of brainstorming, sharing and collaboration reflected as well in the final product: a video promoting the collaboration between different groups of Youth with a common passion for music and for their reality. The intention was to share the video on social media to increase interest in this kind of mixed production and sensible messages. Conscious of the still-limited use of social media by most of their fellows (due to the costs of smartphones and connection) and looking for platforms for artists, at the beginning of 2015 the groups started developing new ideas for the use of ICTs to share information and opportunities. They developed the idea of creating an interactive website with a map to locate the groups, their area of activities and their collaborations. Even groups dedicated to more traditional types of art got involved, inspired by the artistic collaboration that took place with the DST creation and conscious of the support they

would receive by the ICTs experts of the network, as happened for the editing of the video. Given that the website maintenance was quite demanding in terms of capabilities, in the course of the year they started using Facebook groups pages. The Youth Network Facebook group page reached 404 members while one of the groups of poets Facebook pages reached 1.390 likes. Social media appears to be easier and of immediate use and comprehension, especially for regular content updates and uploads.

The Mamas' video – A digital exchange meeting

The groups of Mamas met by the main researcher during the previous years of work in the townships associate themselves to a community network with social aims: the Mamas work as facilitators and mobilise other women and groups around their own resources and capabilities to support the most vulnerable people of the area (Figure 4).

The groups attend exchange meetings to share information, experiences and skills. They discuss everyday activities as a means to improving visibility and networking with lobby groups and activists that can help advance community goals. Gatherings and exchange meetings stimulate creative innovation and transformation. They fulfil at first a social need: to break isolation in the urban area and to foster community trust.

An evaluation was conducted in April and May 2014 with 49 women concerning their ICTs skills and the presence of some infomediaries. A limited interest was shown by the Mamas to deepen the discourse around modern technologies (Lorini, van Zyl et al, 2014). The researcher suggested setting up a DST experiment with one of the groups to try to elicit more data about their activities and above all their approach to ICTs. Knowing their scarce use of technologies in general, she wanted to test and evaluate the use of some basic tools. In October 2014, she asked one of the facilitator and social worker of the community to select a group active in the mobilisation and sensibilization of the community of Philippi around social issues.

The DST Process

Two groups attended the first meeting, both part of the same network of active women called OVC - Orphan and Vulnerable Children.

The researcher introduced the idea of creating a digital story explaining how it can be done, what it can represent and what they are supposed to do to realize it. After the general agreement, the researcher divided the present members into the two original groups in order to verify the capabilities, desire and motivation of each of them before trying to collaborate in a new network activity. Each group had a room allocated and started developing some ideas about what they would like to say about their own group.

The researcher acted as a workshop facilitator in each of the groups, helping participants to give form to their ideas. The aim was to represent each group in less than two minutes to have the possibility to create a five-minute video descriptive of the collaboration. This activity resulted to be quite complex because the Mamas were not aware of the time passing while talking: all of them could talk for a long time but when requested to write and summarize, the presentation became really short: less than 30

seconds of audio recording. At the end of this exercise done by each group, the researcher gathered all the participants together to record the final version in front of everybody.



Figure 4 - The Mamas research setting.

At the beginning, none of the Mamas was comfortable talking in a microphone but eventually it became a fun activity. After recording, the researcher stimulated a short discussion about the link between the groups and what they would like to say about the network they both belonged to. One person spoke on behalf of both groups and on behalf of the network to present the commonalities and the main aim of their existence. Every present person agreed on what was expressed and needed to be part of the second and last part of the video. Once the recording of the audio for the video was completed, the field researcher edited it on her laptop.



Figure 5 - During the video making process the Mamas used their photo-books to showcase community members and their work.

Concerning the images and videos to be added, the researcher verified the possibility to attend some of the everyday activities of the Mamas such as distributing soup to vulnerable children, or support groups for women as well as weekly meetings. Meanwhile group members searched for old pictures of their activities (Figure 5). Sometimes they found printed pictures and in a couple of cases pictures that had been printed in local magazines reporting on specific manifestations. These are the kind of memories collected and safe-kept to demonstrate their work (some printed pictures were attached to the notebook where they collected data concerning their activities) and as motivational support while sensitizing new possible members. By the beginning of December 2014, the researcher collected all the material and organised a meeting to show the selection to the participants for approval. Every Mama was feeling overwhelmed in seeing herself, her neighbourhood and her daily activities on a computer screen. So far, they were used to having an extremely limited number of photos and in a small printed format. While visualizing the images, they listened to the audio recorded to discuss about the positioning of every image along the story flow.

Even if at the beginning the DST process was driven by the researcher, the activities continued mainly because participants felt engaged and were having a good time. Voice recording done as a collective activity, the search for old pictures done at the individual group level, and the presentation done by the researcher of some pictures of their activities which could match their discourse, all showed their growing interest and possible further commitment to develop new ideas. The discussion that emerged at the end of the final presentation of the edited video (audio and photos put together by the researcher) about the way forward and the questioning of the utility of this kind of activity, represented the moment of awareness of the potentiality of some ICTs.

DST Outcome

By agreement of all the participants in the workshop activity, the researcher composed the presentation of the two groups with their respective pictures of their everyday activities of support to the community and the summary done by one member to describe their collaboration. The images chosen for this last section were taken during the network meetings and mobilization events. If at the beginning of the DST activity the intention was only to disclose the group and encourage its interaction with technology, the activity evolved into a collaboration of two groups. Moreover, a possibility emerged to utilise the video for the network itself, to present their work to other groups, an activity usually done during their exchange meetings that were always rare due to the transportation costs involved. To reach this objective and become capable to record their activities and give them visibility, such as in the video they edited, at the beginning of 2015 the Mamas asked the researcher to support their quest to learn to use the technologies she was using and develop further the possibilities they perceived as useful. A series of training and follow-up engaged the groups during the course of the entire year, starting with an intense one-week training attended by the representatives of five different groups. In 2016, the youngest and more skilled Mamas engaged in the process to become facilitators for new trainees.

The role of collective DST in stimulating community participation

The research project utilised collective DST as a method to generate data for the research and engage participation and creative expression for the groups involved. The approach taken was characterised by emergence, referring to an open, creative and engaging process, unfolding guided by cues, actions and aims configured collaboratively through the intervention and exchanges with participants. Whilst DST sessions were organised in the frame of a research and design project, the creative activities were not designed top-down to answer a specific research question or to explore a particular design problem. Rather, DST was framed as a set of creative activities driven bottom-up by participants' interests and aims, as they were discovering creative possibilities along the way. These evolving processes opened up new opportunities for dialogue to maximise people's participation, support the groups' reflection, and allow them to be part of a process of collective engagement that could strengthen their collaboration. The ongoing brainstorming and discussions, the meetings to decide the way forward, the gatherings to select the pictures, the walks in the communities to record images, the interviews done by the researcher and by the participants with the larger community members, all contributed to strengthening participants' capabilities to use ICTs, to intensified processes of deliberation and collective sense-making, and to forging new ways of engaging with the local context.

Community radio station documentary

The participants in the radio station project had a clear aim in mind connected with the needs of the station. During the focus group they expressed their desire and passion for their work, yet their ambition and their commitment were not the central theme of the video. The key and creative element of the video was the representation of their community and their listeners and included a call to support their project. This change of focus was discussed and agreed collectively during the creation of the video.

This was afforded by the DST activity, firstly because it gave the possibility to come together as a group to exchange opinions and create an artifact that could represent their work and achievements for the public. It provided an occasion to reflect on their reason to exist as a group and to collaborate. Furthermore, the process of collective creation of a digital story allowed participants to work with new tools, in particular visual ones, used like critical artefacts: "tools for exploring problems context and generating needs-focussed products ideas" (Bowen, 2007, p.14). They are alternative probes used to stimulate creativity, sometimes only to provoke the participants to reflect critically about their practices, other times as a strategy to deepen the exploration of possibilities through the exposure to unfamiliar experiences. For the participants, this was a generative process for new ideas on how to reach out more and to different people, how to involve the listeners and how to reciprocate their demonstrated esteem and support. It showed the potential for a better understanding of the community at large, operating as a catalyst of sense-making that went beyond the group itself. It became for all the participants a source of inspiration of an extended project that will reach out to a larger audience beyond community borders. The request of the radio station funders to the researcher to accompany them during the interviews and walks in the community

represented a possibility to verify the information received and to acknowledge and testify to the spirit not only of the DST but also of the entire radio station project. The researcher was able to deepen the talks with the participants as well as with the external community members while attending the encounters as an observant.

Youth motivational video

The hip hop group that had suggested the creation of a video and invited other groups to collaborate, had a specific idea in mind: to create a music video to show the potential of a new type of art collaboration. The first day of work on the collective DST ended with an agreement on the music track to use, and the expressed intention for the three sub-groups participating in the activity to elaborate a presentation to be added by each of them. Everybody was actively engaged and participating, however at that point in the process the aim was still 'personal': connected to the presentation of the individual groups and their capabilities as artists. The moment of realization of the different message and outcome that the video creation could bring, not only for the involved participants but also for the community of youth at large, happened when all the participants gathered to present their contributions. Once everybody heard the new poem written for the video, they decided to elaborate around it, expand its message, update it, and make it concrete and visible in the digital story. Further, after a second round of individual work as single groups, they exchanged views to agree on the creation of a title and of an image that can synthesize it.

The researcher acted as a facilitator while suggesting how to approach the new challenges, leaving any decision-making to participants. The need for the participants to translate into another language some of the ideas that were emerging, acted as a moment of reflection and crystallization of the intentions. The explanation of the creative ideas to the external person, the only non-artist, the researcher, supported as well the data collection and analysis of the process. In this project, the process started as an artistic collaboration and evolved into the creation of a motivational video for youth. At the same time, it served to configure new possibilities to engage and collaborate. Coming together, expressing individual and group visions, brainstorming and playing with words and images inspired them to think of starting a concrete project for the youth of their own community and beyond.

Mamas' digital exchange video

In the case of the collective DST of the groups of Mamas, the researcher is the one who suggested the activity as a possibility to know better the groups and to expand expressive possibilities, considering that during the focus groups conducted with them, ICTs emerged as a topic of limited interest. The researcher started with a meeting to evaluate the possibility to create a digital story with one group. The idea was to use some technology probes typically employed to examine participants' interaction with novel technology in real-life contexts (Hutchinson et al., 2003; Sabiescu, 2013). User observation is unguided, and the purpose is to understand how people use a technology in their everyday life and interactions (Idem). During the first meeting, when two groups rather than one group attended, the facilitator suggested to work with them

separately to evaluate the internal participation and knowledge of ICTs in each group and how they express their group-based goals. Every group was keen to present their collaborative work and everyday activities in the community. The occasion for a larger collective participation was afforded during their joint presentation. The possibility to share stories and to remember the activities carried on together helped them to reflect on the context they live in and try to ameliorate. The presence of a social worker requested by the researcher for the translation supported the ongoing discussions and created a constant dialogue between the Mamas and the researcher herself. Furthermore, her participation in the daily activities and her request to take pictures for the video kept open the conversation and reflection about the process. The subsequent visualization of the images selected confirmed the common aspects in the work of the groups, strengthened the perspective of common goals, facilitated acknowledging each other’s similar concerns for the most vulnerable, and garnered interest in possibilities to reach out to more people in modern new ways. If the use of ICTs was at first seen as a simple possibility for some members to learn how to use some devices, maybe for the benefit of their group, the engagement into the story creation as a collectivity opened the final outcome of the process to the benefit of the network. The work as a collectivity neutralized the shame and fear to express themselves to a wider audience, starting from the presence of the social worker and the researcher. The visualization of the outcome, the video, by other members in the network was a moment of evaluation and an endorsement of its value, which further informed debates on how to operate as a group. In particular, due to the presence of the researcher during the collective visualization, the participants requested to deepen their knowledge of ICTs to be able to utilise it for their network.

Table 1 - Summary of the case studies and their outcomes.

	Radio station group	Artists’ groups	Mamas’ groups
People	1 group (8 people)	3 groups (8 people)	2 groups (9 people)
Reason to do it	Fundraising for the radio station	Promotion of the collaboration	ICTs exposure
Goals	Fundraising. Presenting their work	Creating a music video. Collaboration. Sharing on social media	Learn about community members. Express themselves. Interact with ICTs
ICTs available	1 tablet (for photo and video shooting) and 1 laptop (for video creation –using an open source software)	1 tablet (for photo shooting) and 1 recorder (for music and interviews recording). 1 NGO desktop to edit the video using a non-open source software	Few basic smartphones (for photo shooting) plus the smartphone and laptop of the researcher
Info-mediaries	1 volunteer of the radio station studied CS while 2 others operate as technicians. The rest of the team used basic phones.	1 artist knew how to edit videos. Support by friends not part of the groups was requested to take pictures.	None of the Mamas had ICTs skills or equipment.

Outcomes	Working on new tools (visual ones in particular). Collective activities involving the journalists, the founders and the managers of the radio station. New ideas generated to have an online version with images and videos.	A different message become central to the video. The video is no more a music video but more a motivational talk to the Youth. Development of new ideas based on the needs (having an interactive digital platform).	Networking activities while doing the DST and while visualising the result. Explicit collective sense-making. Use of new tools to fulfil their aim. Growing desire to learn more.
Role of the researcher	Supervisor and external monitor	Coordinator (for inter-groups collaboration)	Meetings facilitator and video editor
Final product	Documentary	Music and motivational Video	Digital exchange meeting
Follow up plans	Website and online radio	Digital platform for artists	ICTs trainings.

Design principles for an emergent approach to collective DST

The three case studies highlight the potential of collective DST as a catalyst for participation, allowing the participants to be more in control of the process and creating more opportunities to engage a larger audience: the process started in all the cases analysed from a specific group and evolved to open up to the community. DST in this context is a form of cooperative and community design activity. In media studies it has been utilized similarly for collective creative activities (Klaebe & Foth, 2006), as well as in participatory design studies (Mumtaz, 2015). The process illustrated herein is more than an adaptation of classic DST methodologies. Despite knowing the importance of having a clear concept to create a digital story, or the consideration of a future audience to showcase the outcome, the researcher never pressed the groups to focus on these aspects. The activities evolved following the ideas generated on the spot, all connected to activities that the groups cherished: from taking pictures in the community to making interviews or writing a new poem. At the same time, groups acted as collective units where decisions were taken through discussion, and where no single member tried to take the lead and decide for the group. Even if the members of the group worked at times partially separated, the flow of the story and the main concepts to highlight always emerged when everybody was present.

The value of the emergent approach we propose resides in its flexibility and its capacity to emulate a local context and be shaped in interaction with participants. Every project evolved and matured in different timeframes with different methodologies. The radio station DST was the quickest to be produced due to strong motivation and awareness of its future use (less than one month), owing as well to the technical skills of some members. The youth video required more time due to the unfolding creativity and ideas generation of the artists and their emerging motivations (more than one month). The

Mamas video requested the presence and contribution of the researcher in more occasions along a two-month collaboration.

These qualities of flexibility and adaptation to the local context make it difficult to elicit rigid guidelines for designing this type of activity. However the analysis of the case studies shows a series of elements that were common and important in determining the flow of the activities and their successful outcomes. These elements are synthesised below in seven design principles, proposed as concepts or drivers to sensitise the designers to different possibilities (Hornecker et al., 2007; Sharp et al., 2007). The principles were identified through attention to the relatedness among the participants in the DST (designers and/or researchers and the local community), the local environment and the unfolding of the creative processes on a timeline.

1. **Inspire within the context.** Storytelling in community settings is about recovering memory (of the past) as well as renewed awareness and understandings (of the surrounding environment). Its capacity to engage, motivate and inspire owes much to the fact that participants are provided with the frame, tools, and creative purpose that can drive them to actively seek, examine, interact with and model understandings of their own past and present realities in a creative way. With this principle, we point to the importance of using DST as a framework and as a driver to encourage local participants to engage with their world in ways that were not afforded by their everyday lives. This can take many forms in practice, and digital technology can be used for activities of exploration, capture, representation, collective visualisation etc. For its capacity to involve participants in the exploration of their environment, this creative activity is close to the use of cultural probes. Initially studied by Gaver and colleagues (1999), cultural probes are used as a means for involving people in the active examination of their own environments, and thus elicit their unique viewpoints and integrate their visions in design projects. Cultural probes have been shown to contribute to participants' engagement and encourage them to get involved in cooperative forms of design (Crabtree et al., 2003).
2. **Local anchoring of expressive means.** This principle is about privileging local means of creation and representation. In communities like those involved in the DST case studies presented, listening and speaking are the main vehicles for communication. For this reason, they were privileged in the collective DST processes: giving space for participants to speak and listen to each other and express themselves through natural ways of communication and interaction before starting to write. Writing, above all as a collectivity, might be perceived as 'demanding' and intimidating. On the other hand, listening to each other can become a creative moment of sharing. These observations draw attention to a quintessential quality of storytelling, which is about human expression taking shape, externalised in a particular representational form. Representational forms are not neutral; they have a bearing on the process of expression and can alter as well the meanings that are finally externalised or communicated. Expressing through writing is not quite the same as expressing through painting, singing or performing. Expressive means are also culturally embedded, and linked to the

intangible heritage of communities. In our approach, we propose increased sensitivity to local ways of representation and creation as a means for encouraging participants to be at ease and avoid ruptures with deeply embedded forms, structures and flows. This approach encourages creative participation, and furthermore it can then provide bridges for introducing new means of expression, new tools and new methodologies. By building on participants' capacity to become creative in ways that they are familiar with and that they master, the space is opened for new ways and means of creativity to be appropriated, as well as the desire for learning and interest in adopting novelty.

3. **Local agency.** Participants' sense of control and agency over the DST process can contribute to initiative, enthusiasm, faster consensus, and a sense of owning the process, rather than receiving it from an outsider. The degree of agency afforded depends on the participants' familiarity with the process and tools and their self-confidence to act autonomously. For the radio station and the youth project, the researcher acted as a simple facilitator, while for the Mamas, she was more involved and acted also as editor for the technical phases. Participants' agency can increase during a process where new skills are acquired, new elements emerge or new capabilities are available. The sense of agency and ownership can be heightened by a collective approach to creative activities. In the cases described, the decisions and choices were always taken when the groups were gathered. This helped participants to take charge of and drive the process; united they felt stronger and less intimidated when expressing their needs and desires. This also reduced the interference of the facilitator.
4. **Shared purpose.** The purpose of an emergent DST initiative is not pre-defined, but created or at times discovered by recognizing how pre-existing community needs and goals can be met through DST. We point to the importance of acknowledging the aims of the creative processes, not only in terms of the story or stories to be created but also and quite significantly about the kind of benefit brought, or community target reached through the process and outcomes of storytelling. The shared purpose thus can emerge and be externalized in terms of one or several stories to be created in groups, as well as an aim filled through the creative process that benefits the groups or the entire community. It is important while working collectively to be aware of the barriers to story evolution that group work implies. In the cases presented, moving further with ideas, dropping concepts that no longer worked, was challenging due to the more demanding process of collective decision-making and action. It was essential to remind each other that the story can evolve and the process can bring novelty, for instance connected to the reactions of the listeners, to the agreement between members and in response to new ideas that emerged. Ensuring awareness of a shared purpose within a group facilitates channeling efforts and activities towards collectively agreed ends; it acts as an element of convergence.
5. **Elements of convergence.** By elements of convergence, we mean tools, processes, infrastructures or flows that can enable groups of people to work,

decide or create in groups as well as ensure coherence and consistency in the final product. This principle is about affording DST as a collective rather than an individual activity. To involve groups rather than individuals, it is important to find ways for ensuring harmonic collaboration, communication, and means for reaching consensus at key points during the creative process. This encourages participants to pay attention to the others, leads to more moments of sharing and listening, and increases sensitivity to how the actions of a person complement and build upon the actions of fellow creators. Convergence can be afforded as well by encouraging alternation of collective and individual activities during story creation. In the cases described, the process was kept flexible with the possibility to work alternatively with the entire group, with some members of it or with individuals. A cycle of opening and closing the circle of participants was adopted and iterated until the artefact was ready. For instance, the initial phase in which the aims of the activity were discussed was done with the entire group present, to facilitate understanding and collective agreement over the envisaged end-product and the process of reaching it. Subsequent activities were conducted in smaller groups or at individual level, to allow everyone to express themselves and to report back to the entire group or groups. The re-opening of the process to the entire group was done at key stages, to communicate messages, support meaning sharing, and gather consensus. This cycle can be modified and repeated as required in order to give everybody the possibility to be both creative and collaborative.

6. **Horizontal exchanges.** As a counter-point and complement to local anchoring and local agency, we posit that the part played by researchers or designers is no less important. The knowledge, tools, ideas, affordances for expression brought or co-created are fundamental for the evolution of the creative process. It is through horizontal exchanges – building on the principles introduced beforehand, of local anchoring, and local agency – that ideas but also knowledge and skills expand, cross-fertilise and evolve. Whereas it can be thought that skills are needed to participate in creative technology activities, cases such as the ones presented in here point out that creative drives can be used to overcome skills barriers and bridge skills gaps. This is due to the potential of horizontal exchanges within local participants and among them and researchers or designers. Group members may already possess skills that can be transferred to other members. Also, with support from the group and working together, participants feel less intimidated by the novelty of ICT tools and processes and may engage in learning driven by a creative impetus rather than a goal to acquire new skills. For example, in the case of the Mamas where less technical skills were present, they followed the creative flow and worked as “art directors” to edit their work: the facilitator-researcher showed the selected pictures to match their stories, while the group discussed and decided about the composition.
7. **Mindful evolution.** This is about expecting but also encouraging evolution of the DST process, its methods, engagement and participation means, its content and message, as well as the capacities and skills of participants. Evolution

reflects the emergent nature of the process described, within a framework that encourages collective participation and flexible, emergent models of activity. Participation and sense making unfold as a process of active questioning, inquiry and exploration, motioning participants to move in cycles of knowledge production, sharing and exchange that enable them to perceive themselves, their peers, and their surroundings or work in a new light. The outcomes of the evolving processes usable in the DST sessions – ideas, concepts, flow of the story - are only some, and the most tangible results of the participation and co-design process. At the same time, other, intangible outcomes can be attained and can keep unfolding. The exchange processes can enable participants to understand, perceive, and express things that had been beforehand either acknowledged but not shared; known tacitly, but not expressed; or simply unknown. The time can also allow the outcomes to reach out for the communities of belonging, and not only for the group. For the community radio station, collective participation helped members understand the vision of each of them and clarify their common ideals and goals while highlighting the sense of their activities for the larger community. For the hip-hop and marimba artists the process brought about agreement of a strong, core message they wanted to convey through the video but also helped them push further the boundaries of artistic expression and collaboration in ways that could not have been afforded by each artist working alone. Similarly the Mamas, who used the workshop as a fun way to understand the capabilities of new ICTs, came to realise that the technologies they were exposed to can be appropriated by themselves and used as a way to exchange information within the group and promote it outside of it.

Conclusions

This paper engaged with issues around uplifting community participation in design and examined the role of collective DST as a creative activity that can spur engagement and encourage the articulation of local needs and goals in the early stages of design. We presented three case studies in which DST was used as part of a larger project, as a bridge between the initial exploratory phase and an engaged and action-oriented design stage. Our findings show that DST can stimulate collective participation, support the unfolding of data and spur the creativity also for new projects. We underline the value of an emergent, non-linear, community-driven approach for collaborations with collectivities of people. We illustrated this approach by providing detailed descriptions of activities and outcomes in the three case studies. Furthermore, we elicited seven design principles that can be used as sensitising concepts for affording the set up of community-based DST initiatives framed by an emergent approach.

In the case studies analysed, the emergent and free flow nature of the DST process was a catalyst for engaged participation and sense-making and resulted in meeting context-specific goals for all three groups: from realizing the importance of a sub-community within a larger community ecology, understanding the importance of the message a video can convey, to building awareness of the powers of representational technology to share ideas and values between the inner and outer community members. Furthermore,

the DST processes spurred ideas for future work driven by local initiatives and appeared to motivate participants to get involved in pursuing them.

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