# PARTICIPATORY DESIGN, DIGITAL TECHNOLOGY AND CULTURE: AN ANNOTATED BIBLIOGRAPHY

**Compiled by Richard Langridge, Shamus P. Smith and Erica Southgate**

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**PARTICIPATORY DESIGN, DIGITAL TECHNOLOGY AND CULTURE: AN ANNOTATED BIBLIOGRAPHY**

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**ABSTRACT**

Since the 1970's, participatory design has risen to prominence in many fields. Participatory design is a set of theories and practices that include end users as designers within the scope of a project. Membership of cultural (and subcultural groups) poses opportunity and challenges for participatory design in that generic processes may need to be modified. This annotated bibliography compiles scholarly literature, published between 2006-2017, that has a combined participatory design, digital technology and cultural focus.

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## 1. Purpose and scope of report

### Background

Since the 1970's, participatory design has risen to prominence in many fields and gained popularity in the area of human computer interaction and technology development (Gennari et al, 2017). Participatory design involves the direct contribution of people in the collaborative design of the things and technologies they use (Plaisant & Shneiderman, 2010). Participatory design encompasses the stages of initial exploration and discovery followed by prototyping (Spinuzzi, 2005). Users can be engaged in the following ways: user stories (where designers and end users create small stories on how the final product may be used); workshops (when both the end-users and designers brainstorm what the product might require for acceptance; and, prototyping (where end-users provide feedback on a prototype) (Muller, 2003).

Culture can be defined as: 'The learned ideas, values, knowledge, rules and customs shared by members of a collective (such as those based on ethnicity, gender, sexuality, indigeneity, age, disability) (Holmes et al.2015, p.9). This definition emphasises group membership and interaction in making sense of the world, including its processes and objects. Group membership is related to different ways of understanding and being in the world. Membership of cultural (and subcultural groups) poses opportunity and challenges for participatory design in that generic processes may need to be modified so that they are culturally appropriate. This will then better inform the development of a digital product and improve user experience.

### Purpose

This report provides an overview of recent digital technology research that has both a participatory design and cultural focus. Learning from such research is vital if participatory design is to be effectively used to develop effective, 'best-fit' technological solutions and products.

### Method

To identify the peer-reviewed articles and conference papers, a Boolean search using AND/OR was conducted (using the following key terms and words: Participatory Design, Co-Design, Indigenous, HCI, User-centred Design, Serious Games, Computer, Culture, Cultural Design, UX and User Experience. The following databases were used: Science Direct, ACM Digital Library, Web of Knowledge, Google Scholar and Scopus. Papers were also found by utilising the conference website for participatory design (http://pdcproceedings.org/ - Last accessed 27/06/2017). In addition, any citations of identified papers were examined for relevance to this annotated bibliography. The search was restricted to literature published between 2006-2017. Books and book chapters were excluded from the search. Only peer reviewed literature has been included.

### References

Gennari, R., Melonio, A., Raccanello, D., Brondino, M., Dodero, G., Pasini, M., & Torello, S. (2017). Children's emotions and quality of products in participatory game design. *International Journal of Human-Computer Studies*, 101, 45-61.

Holmes, D., Hughes, K., & Julian, R. (2014). *Australian sociology*. Pearson Australia.

Muller, H., J. (2002). Participatory design: the third space in HCI. In *The Human-Computer Interaction Handbook*, Julie A. Jacko and Andrew Sears (Eds.). L. Erlbaum Associates Inc., Hillsdale, NJ, USA 1051-1068.

Plaisant, C. & Shneiderman, B. (2010). *Designing the user interface*. Pearson Education.

Spinuzzi, C. (2005). The methodology of participatory design. *Technical communication*, 52(2), 163-174.

## 2.  ANNOTATED BIBLIOGRAPHY

**Akama, Y., Keen, S., & West, P. (2016, June). Speculative design and heterogeneity in Indigenous nation building. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems* (pp. 895-899). ACM.**

*Keywords*: Australian Indigenous nation building; heterogeneity; participatory design; postcolonial HCI; speculative design

This paper presents a methodological exploration in postcolonial HCI. We share early insights of designing a digital platform for Indigenous nation building in Australia that speculate ways to catalyse, provoke and support necessary discussions of governance, plurality, cultural integrity and knowledge ownership. Rather than expecting consensus building or striving for problem-resolution, prototyping this digital platform has begun revealing tensions, complexities and possibilities that are significant to nation building. Manifesting and actively debating these became an epistemological pursuit for knowledge generation, but also a necessary ontological one in actively carving out "agonistic" engagements that challenges hegemony and practice ploy-vocal future-making. (Abstract)

**Aryana, B., Boks, C., & Navabi, A. (2011, July). Possibilities for cultural customization of mobile communication devices: The case of Iranian mobile users. In *International Conference on Human Centered Design* (pp. 177-186). Springer Berlin Heidelberg.**

*Keywords*: cultural customization; emerging markets; mass customization; mobile HCI; new product development; smart phones

Global producers of mobile communication devices recognize the importance of cultural differences in the emerging markets; however it seems that the main concentration in both academic and business areas is on the large number of users with low incomes, while users from other classes of these societies are not studied well. In this study after set of integrated reviews on areas of Mass Customization, New Product Development and Mobile HCI an experiment was planned based on the unexplored aspects of users' culture and mobile communication devices relationships. A number of young educated users from middle class tested a new smart phone during its marketing process in Iran. They were sampled based on a global producer's marketing program. After a phase of self documentation, users selected two applications of the device for the usability tests and found culture related usability problems during the tests. Finally they proposed solutions in a participatory design process. (Abstract)

**Aryana, B., Clemmensen, T., & Boks, C. (2015). Users' participation in requirements gathering for smart phones applications in emerging markets. *Universal Access in the Information Society*, 14(2), 265-280.**

*Keywords*: country-specific usability; Iran; participatory design; requirements gathering; smart phones; Turkey

This study presents insights from using requirements gathering techniques for country-specific customization of smart phones in two emerging markets, Iran and Turkey. In each country, a group of users participated in requirements gathering sessions that were aimed at developing design ideas

for overcoming country-specific usability problems. Using qualitative content analysis, it was found that in each country some specific interaction activities were considered more when participants generated design ideas for country-specific usability problems. It was also found that even for similar usability problems, participants suggested country-specific solutions. Therefore, it is suggested that participation of local users in the design process should not be limited to identification of usability problems, but should also include the problem-solving phase that is usually a phase in design and development processes in which requirements gathering techniques are being used. (Abstract)

**Blake, E. H., & Tucker, W. D. (2006). Socially aware software engineering for the developing world. In P. Cunningham & M. Cunningham (eds.),** *Information Society Technologies - Africa (IST-Africa)*. **Pretoria, South Africa: IIMC International Information Management Corporation.**

*Keywords*: action research; computer science; developing world; human computer interaction; participatory design; software engineering; free and open source software

While the social effects of Information Technology (IT) have received much attention there is very little work on targeted methodologies to develop IT applications and content in a developing world environment. This paper describes a methodology called Socially Aware Software Engineering we are busy formulating based on firsthand experience building Information and Communication Technology solutions. Our method is based on a classical user-centred approach from Human Computer Interaction combined with aspects of Participatory Design and cyclical software engineering practises. These approaches are wrapped into an iterative Action Research paradigm in order to directly include the community-based users of our systems. We outline three cases studies based on our evolving method. The paper concludes with suggestions on changing the nature of tertiary curricula in developing countries in a way that integrates this socially aware software engineering methodology. (Abstract)

**Bidwell, N., & Hardy, D. (2009, November). Dilemmas in situating participation in rural ways of saying. In** *Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7* **(pp. 145-152). ACM.**

*Keywords*: Indigenous culture; rural; technology probes

We reflect upon participation in design processes by people who emphasise 'primary orality', or direct, face-to-face, unmediated communication, due to their rural locations in places with low technology ambiance and cultural antecedents. We focus on issues and relationships between rural contexts and primary orality of relevance to our projects with Indigenous people in regional Australia and villagers in remote rural South Africa. We observe dilemmas as we apply methods, which are informed by ethnomethodology, ethnography and Participatory Design, in enabling local participation, such as intrusive recording practices, concerns about power structures and appropriate investment of time. (Abstract)

**Bidwell, N. J., Winschiers-Theophilus, H., Kapuire, G. K., & Rehm, M. (2011). Pushing personhood into place: Situating media in rural knowledge in Africa.** *International Journal of Human-Computer Studies*, **69(10), 618-631.**

*Keywords*: traditional knowledge; rural; Africa; spatial; temporal; locative media; topokinetic; topographic

Designing interactions with technologies that are compatible with rural wisdom and skills can help to digitally enfranchise rural people and, thus, contribute to community cohesion in the face of Africa's urbanization. Oral information has been integral to rural identity and livelihood in Africa for generations. However, the use of technology can inadvertently displace the knowledge of communities with practices that differ from the knowledge traditions in which technology is designed. We propose that devices that are sensitive to users' locations, combined with platforms for social networking and user-generated content, offer intriguing opportunities for rural communities to extend their knowledge practices digitally. In this paper we present insights on the way rural people of the Herero tribe manage information spatially and temporally during some of our design activities in Namibia. We generated these insights from ethnography and detailed analysis of interactions with media in our ongoing Ethnographic Action Research. Rural participants had not depicted their wisdom graphically by photography or video before, rarely use writing materials and some cannot read. Thus, we gathered 30 h of observer-and participant-recorded video and participants' interpretations and interactions with thumbnail photos from video, photography and paper. We describe insights into verbal and bodily interactions and relationships between bodies, movements, settings, knowledge and identity. These findings have made us more sensitive to local experiences of locations and more aware of assumptions about space and time embedded in locative media. As a result, we have started to adopt an approach that emphasizes connectors rather than points and social–relational and topokinetic rather than topographic spaces. In the final section of the paper we discuss applying this approach in design by responding to the ways that participants use social relationships to orient information and use voice, gesture and movement to incorporate locations into this "dialogic". In conclusion we outline why we hope our reflections will inspire others to examine the spatial, temporal and social affordances of technologies within the bonds of rural, and other, communities. (Abstract)

**Brereton, M., Roe, P., Schroeter, R., & Lee Hong, A. (2014, April). Beyond ethnography: Engagement and reciprocity as foundations for design research out here. In *Proceedings of the 32nd annual ACM Conference on Human factors in Computing Systems* (pp. 1183-1186). ACM.**

*Keywords*: ICT4D; participatory action research; postcolonial HCI

This paper explores an emerging paradigm for HCI design research based primarily upon engagement, reciprocity and doing. Much HCI research begins with an investigatory and analytic ethnographic approach before translating to design. Design may come much later in the process and may never benefit the community that is researched. However in many settings it is difficult for researchers to access the privileged ethnographer position of observer and investigator. Moreover rapid ethnographic research often does not seem the best or most appropriate course of action. We draw upon a project working with a remote Australian Aboriginal community to illustrate an alternative approach in Indigenous research, where the notion of reciprocity is first and foremost. We argue that this can lead to sustainable designs, valid research and profound innovation. (Abstract)

**Byrne, E., & Sahay, S. (2007). Participatory design for social development: A South African case study on community-based health information systems. *Information Technology for Development*, 13(1), 71-94.**

In this paper, the role of participation within the domains of information system (IS) research and social development is analyzed. Specifically, we examine how the process of IS development, and the IS itself, can reflect and shape the status of social development. Traditionally, participatory design (PD) research in IS has focused on business contexts in the Western world, with minimal application to developing country settings, especially in the context of social development. This paper seeks to contribute to developing these understandings and bases its analysis on a case study of a community-based health IS in South Africa. The case study involved the design and development of a community-based child health IS in a rural area of South Africa. Nationally, the formal district health IS in South Africa includes data only on those people who access health services through the health facilities. The premise behind developing a community-based child health IS was to include all the people living in that district in the district health IS. Analysis of the case study reveals three ways in which traditional PD needs reconceptualization. First, it is not only the users of the IS who should participate, but also those individuals who are affected by the IS, even when those individuals have no direct interaction with the system itself. Second, whereas there is some recognition in PD literature of the need for the participation of people at different levels vertically distributed within an organization, there has been little recognition of the value of involving actors outside the organization or sector. Third, the capacity of the users and those impacted by the system needs to be developed to ensure effective participation in the IS design and development processes. These three approaches to PD in IS, whose purpose is to contribute to social development, are essential components of a participatory strategy. (Abstract)

**Cabrero, D. G., Kapuire, G. K., Winschiers-Theophilus, H., Stanley, C., & Abdelnour-Nocera, J. (2016, April). An UX and usability expression of Pastoral OvaHimba: Personas in the making and doing. In *Proceedings of the 2nd International Conference in HCI and UX on Indonesia 2016* (pp. 89-92). ACM.**

In working with novel communities there is an imperative need to finding what triggers initial interests and sustains engagement in the co-design of useful, respectful and enriching technological experiences for the very end-user. Co-planning with ovaHimba communities in Namibia tools such as the persona artefact strives to aiding the codesign of a Crowdsourcing system to collect, store, classify and curate Indigenous Knowledge (IK). Preliminary results and insights, pervasiveness in use, and overall designerly backing of persona artefacts for usability and User Experience (UX) invite an initial journey on, and study of the User-Created Persona (UCP) protocol to elicit design elements relevant to ovaHimba. Findings reveal vital features of humanness, collectivism, and attire likings in the way both, existing technologies impact community members and on how upcoming ones are felt, required and preferred for the future to come. This paper informs latent and explicitly situated aspects of usability and UX prompted by prototypes and conversations. Such findings aim to deciphering UCP to communicate and support ethicalities, and technological interests, requirements and goals of pastoral ovaHimba. (Abstract)

**Cabrero, D. G., Winschiers-Theophilus, H., Abdelnour-Nocera, J., & Kapuire, G. K. (2016, August). A hermeneutic inquiry into user-created personas in different Namibian locales. In** *Proceedings of the 14th Participatory Design Conference: Full Papers-Volume 1* **(pp. 101-110). ACM.**

*Keywords*: UX; cross-cultural design; cultural usability; participatory design; personas; user-created persona

Persona is a tool broadly used in technology design to support communicational interactions between designers and users. Different Persona types and methods have evolved mostly in the Global North, and been partially deployed in the Global South every so often in its original User-Centred Design methodology. We postulate persona conceptualizations are expected to differ across cultures. We demonstrate this with an exploratory-case study on user-created persona co-designed with four Namibian ethnic groups: ovaHerero, Ovambo, ovaHimba and Khoisan. We follow a hermeneutic inquiry approach to discern cultural nuances from diverse human conducts. Findings reveal diverse self-representations whereby for each ethnic group results emerge in unlike fashions, viewpoints, recounts and storylines. This paper ultimately argues User-Created Persona as a potentially valid approach for pursuing cross-cultural depictions of personas that communicate cultural features and user experiences paramount to designing acceptable and gratifying technologies in dissimilar locales. (Abstract)

**Cabrero, D. G., Winschiers-Theophilus, H., & Abdelnour-Nocera, J. (2016, November). A critique of personas as representations of the other in cross-cultural technology design. In** *Proceedings of the First African Conference on Human Computer Interaction* **(pp. 149-154). ACM.**

*Keywords*: co-design; cross-cultural design; personas; user involvement; user-centred design; user-created personas; UX

A literature review on cross-cultural personas reveals both, a trend in projects lacking accomplishment and personas reinforcing previous biases. We first suggest why failures or incompleteness may have ensued, while then we entice a thoughtful alteration of the design process by creating and validating personas together with those that they embody. Personas created in people's own terms support the design of technologies by truly satisfying users' needs and drives. Examining the experiences of those working "out there", and our practises, we conclude persona is a vital designerly artefact to empowering people in representing themselves. A persona-based study on User-Created Persona in Namibia contrasts the current persona status-quo via an ongoing codesign effort with urban and rural non-designers. However we argue persona as a design device must ease its implicit colonial tendency to and impulses in depicting "the other". Instead we endorse serenity, mindfulness and local enabling in design at large and in the African context in particular. (Abstract)

**Dutta, U., & Das, S. (2016). The digital divide at the margins: co-designing information solutions to address the needs of Indigenous populations of rural India.** *Communication Design Quarterly Review*, **4(1), 36-48.**

*Keywords*: culture and usability; intercultural design; international communication; localization; prototyping; visual design

This paper presents the results of a case study focusing on information and communication design in Indigenous villages of rural India. The villages examined for this study were geographically remote and socio-economically underdeveloped, and their populations represented individuals who possessed low levels of literacy, limited language proficiency in English and mainstream Indic languages (e.g., Hindi and Bengali), and limited familiarity with computer use and computing practices. The authors sought to examine this context by conducting ethnographic field research involving a variety of methods. Through these approaches, the authors found a range of cultural and contextual factors are instrumental in shaping and co-creating communication design solutions for underserved international audiences. (Such factors include such as long-term research engagements, in-situ design development, and embracing dialogic and reflexive praxis when designing for local audiences.) (Abstract)

**Elovaara, P., Igira, F. T., & Mörtberg, C. (2006, August). Whose participation? Whose knowledge?: Exploring PD in Tanzania-Zanzibar and Sweden. In** *Proceedings of the Ninth Conference on Participatory Design: Expanding Boundaries in Design-Volume 1* **(pp. 105-114). ACM.**

*Keywords*: Sweden; Tanzania-Zanzibar; ambiguity; differences; methods; participation; work practices

In this paper we discuss two Participatory Design (PD) projects, one in Tanzania-Zanzibar and the other one in Sweden. In both countries the design process was done through the analysis of work practices involving both designers and users. The discussion focuses on a number of factors such as location, time and scene. We also ask how different projects can be that it is still possible to talk about PD as an overall participation and design approach. If PD is not a singular, definite, closed and fixed approach on the explicit layers, so how do these projects relate to each other when focusing on methods embracing the ambiguities of participation? The paper ends with a discussion of differences and similarities considering participation in the projects. (Abstract)

**George, R., Nesbitt, K., Donovan, M., & Maynard, J. (2012, January). Evaluating Indigenous design features using cultural dimensions. In** *Proceedings of the Thirteenth Australasian User Interface Conference*. **Volume 126 (pp. 49-58). Australian Computer Society.**

*Keywords*: Hofstede's model; culturability; culture; Indigenous; web design

This study compares previous analytical findings in the area of cultural web design using Hofstede's dimensions with findings from a three year case study. This case study used an ethnographic and user-centric approach to better integrate cultural requirements into the website for a specific Indigenous community. We overview this design process and describe the ten key design features that were identified in the project. These design features were considered essential for capturing the cultural identity of the community. They are relevant to designers of Indigenous websites and designers considering culture as part of their interface design process. We evaluate these design features by considering them in terms of Hofstede's cultural model. Some correlations have previously been found between Hofstede's cultural dimensions and the structural and aesthetic design features that are used in websites from different cultures. We compare the ten design features identified from our case study with the outcomes we might expect, given the measured position of the group on Hofstede's cultural dimensions. The best correlations occurred on the

power distance index where the navigation, organisation and image content conformed with expectations. However, a number of contrary results were also found. (Abstract)

**Hakken, D., & Maté, P. (2014, October). The culture question in participatory design. In** *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts*. **Volume 2 (pp. 87-91). ACM.**

*Keywords*: anthropology; culture; participatory design

As efforts to promote Participatory Design (PD) outside of the Nordic region have grown, how to deal with culture has been perceived as an increasingly pressing issue. This paper explicates the cultural problems PD has had and presents alternative approaches to dealing with them. Anthropology is a discipline that has largely been organized through debates about culture. The paper draws on this discourse to argue against PD's tendency to conceive of culture as a single, unified "thing" with ontological status. Rather, cultural perspectives are produced via use of analytic constructs. PD can develop culturally appropriate senses of both participation and design by learning to decompose totalizing notions of culture. One can begin by separating from each other the aspects of culture relevant to a particular PD project, dealing serially with each of them, and only then attempting to construct a "holistic" cultural account. The argument is largely theoretical, an effort to apply the approach being contained in another paper on what happened when PD was tried in Mozambique. (Abstract)

**Hardy, D., Forest, E., McIntosh, Z., Myers, T., & Gertz, J. (2016, November). Moving beyond just tell me what to code: inducting tertiary ICT students into research methods with Aboriginal participants via games design. In** *Proceedings of the 28th Australian Conference on Computer-Human Interaction* **(pp. 557-561). ACM.**

*Keywords*: co-design; Indigenous knowledge; language revitalisation

Many Aboriginal languages are becoming extinct due to lack of fluent speakers. Computer games offer a way to help teach these languages in a fun and engaging way. However, computer games like all technology objects are based in the culture of their creators. In this paper we describe a project where we co-designed a language application for mobile phones with the Gugu Badhun, an Aboriginal community from north Queensland Australia. The participatory action research process allowed our Aboriginal partners to embed their own culture in the games, leading to a product that supported their goals and aspirations for language renewal. This collaboration has not only provided a way to sustain their language, but also added capacity to their community in ICT development. This paper contributes to HCI literature by delineating a respectful approach to collaborating with Aboriginal participants. (Abstract)

**Itenge-Wheeler, H., Kuure, E., Brereton, M., & Winschiers-Theophilus, H. (2016, August). Co-creating an enabling reading environment for and with Namibian children. In** *Proceedings of the 14th Participatory Design Conference: Full Papers*. **Volume 1 (pp. 131-140). ACM.**

*Keywords*: children; design collaborative; participatory design; reading culture; workshop

Namibian children's appreciation of literature is falling behind. While children develop functional literacy, enough to search the web and read for information finding, their skills plateau due to their limited forms of reading. Thus this paper draws on a participatory approach with different stakeholders aiming to co-create a stimulating and enabling reading environment for Namibian children.

Four different participatory workshops were designed to discover ways to deepen the reading culture, in particular by exploring contexts in which children would read and also author books. Acknowledging the different roles of stakeholders in an ongoing national agenda of enhancing the Namibian reading culture, it becomes clear that the various aspirations of children as expressed in their designs need to be accounted for, interpreted and translated into a feasible plan of action. The paper outlines a way of using participatory design workshops at a number of levels to obtain design inspirations for further interventions towards enhancing kids' reading experiences. (Abstract)

**Jensen, K. L., Winschiers-Theophilus, H., Rodil, K., Winschiers-Goagoses, N., Kapuire, G. K., & Kamukuenjandje, R. (2012, June). Putting it in perspective: Designing a 3D visualization to contextualize Indigenous knowledge in rural Namibia. In *Proceedings of the Designing Interactive Systems Conference* (pp. 196-199). ACM.**

*Keywords*: 3D interfaces; cultural design; HCI4D; ICT4D; Indigenous knowledge; perception; perspective; visualization

One design endeavor we pursue in a long-term research and co-design project is the creation of a 3D visualization interface for an Indigenous knowledge (IK) management system with rural dwellers of Herero ethnicity in Namibia. Evaluations of earlier prototypes and theories on cultural differences in perception led us to further investigate the suitability of different perspectives of view for the given user group. Through a combination of drawing sessions, design discussions and a high-fidelity technology probe we explored the visual perceptions and preferences of community members; specifically focusing on representation and recognition of objects and places in their everyday environment. We report how the findings from the study have informed design decisions for our particular system while also suggesting that certain viewing angles for 3D visualizations could be more suitable for rural dwellers in general and the collaborating community in specific. (Abstract)

**Kam, M., Ramachandran, D., Raghavan, A., Chiu, J., Sahni, U., & Canny, J. (2006, June). Practical considerations for participatory design with rural school children in underdeveloped regions: Early reflections from the field. In *Proceedings of the 2006 Conference on Interaction Design and Children* (pp. 25-32). ACM.**

*Keywords*: children; participatory design; third world

This paper draws on a 2-week design workshop conducted at a rural primary school in northern India to provide recommendations on carrying out participatory design with school children in rural, underdeveloped regions. From our experiences in prototyping low-tech and hi-tech English language learning games with rural student participants, we advocate that researchers build a more equal relationship that is qualitatively different from one between teachers and students, enlist local adults and children as facilitators, and explore hi-tech prototyping to inspire the best designs. (Abstract)

**Kapuire, G. K., & Blake, E. (2011, November). An attempt to merge local and technological paradigms in the digital representation of Indigenous knowledge. In** *Proceedings of the Indigenous Knowledge Technology Conference 2011 (IKTC2011): Embracing Indigenous Knowledge Systems in a New Technology Design Paradigm* **(pp. 72-78). Windhoek, Namibia: IKTC2011.**

*Keywords*: Indigenous knowledge management system; rural; traditional; video

Current technology trends and developments have hardly been informed by African Indigenous and rural knowledge systems. Thus either substantial modifications are necessary in adapting technology to the requirements of Indigenous knowledge systems or those systems are inadequately represented through technologies. This paper explores different options of organising video recorded Indigenous knowledge in the pursuit of maintaining local communication patterns and practices. The evolutionary design of our Indigenous knowledge management system is informed by a series of interactions and prototype evaluations with a pilot community in Eastern Namibia. (Abstract)

**Kapuire, G. K., Winschiers-Theophilus, H., & Blake, E. (2015). An insider perspective on community gains: A subjective account of a Namibian rural communities' perception of a long-term participatory design project.** *International Journal of Human-Computer Studies*, **74, 124-143.**

*Keywords*: participatory design; rural community; user gains; user involvement

Community-based co-design takes place within a communal value system and opens up a new debate around the principles of participation and its benefits within HCI4D and ICTD projects. This study contributes to a current gap of expression of participants' gains, especially from an Indigenous and marginalized rural communities' perspective. We have collected community viewpoints concurrently over the past five years of our longitudinal research project in rural Namibia. A number of themes have emerged out of the data as extracted by our native researcher, such as the special importance of learning technology, appreciation of the common project goal, the intrinsic pleasure of participation, frustrations about exclusions and other concerns, as well as immediate rewards and expectations of gaining resources. We acknowledge our own bias in the curation of viewpoints, and incompleteness of subjectivities while embedding our discussion within a local contextual interpretation. Through our learning from the communities we argue for a shift in perspective that acknowledges local epistemologies in HCI and participatory design and research. We suggest considering harmony and humanness as the primary values guiding community-based interactions. We discuss several challenges in the collaboration and co-creation of new knowledge at the frontier of multiple cultural, linguist, research and design paradigms. In the absence of generalized guidelines we suggest to pursue local workability while producing trans-contextual credibility. (Abstract)

**Kapuire, G. K., Cabrero, D. G., Stanley, C., & Winschiers-Theophilus, H. (2015, December). Framing technology design in Ubuntu: Two locales in Pastoral Namibia. In** *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction* **(pp. 212-216). ACM.**

*Keywords*: community members; community-based co-design; humanness transferability; Indigenous knowledge

Situating technology design in the African philosophy of Ubuntu, emphasizes principles of humanness and connectedness in human interactions. Curiosity, interest and learnings have grown among those who have codesigned with us for the past eight years; whereas those who have just began co-designing endeavours take on it in different and also similar manners. This reminds us of our beginnings and initial aims as co-designers in diverse Namibians milieus. Thus, as we exit the known and arrive to anew terrains, we observe different but also similar values, protocols and behaviours amid diverse codesigner groups; also in the way we evolve as researchers co-designing always with the above. Human values at Ovaherero and Ovahimba rural locales depict and magnified differences and also commonalities that, altogether, come as Ubuntu in the sharing and in the practiced philosophy of African Indigenous populations; also of us as researcher co-designers. This paper reflects on how Human-Computer Interaction and technology deal with communities' daily living and humanness in various ways. (Abstract)

**Kapuire, G. K., Winschiers-Theophilus, H., Chivuno-Kurio, S., Bidwell, N. J., & Blake, E. (2010). Revolution in ICT, the last hope for African rural communities' technology appropriation. In** *Proceedings International Development Informatics Association Conference (IDIA2010). (pp. 8).*

*Keywords*: No keywords

In this paper we present a methodological perspective on the challenge of designing products suited to rural practices and conceptualizations in Southern Africa. We take the reader through a variation of experiences with the community involved in the projects. We investigate with experiments on mapping the living lifestyle of the community people to design products that will preserve and playback of rural practices. This paper argues within a theoretical perspective of Development Informatics on designing for the oral and performed knowledge that people routinely share, informally, face-to-face. Such knowledge inherently differs from those knowledge forms that ICT explicates and codifies and is ill-served by knowledge representation and retrieval mechanisms (e.g. hierarchical structures, text-based search, technical ontologies). Uncovering the incompatibility of existing technologies with the representation of African Indigenous Knowledge systems (AIKS) reveals our own conceptual limitations in finding new answers without falling back on familiar ICT patterns, be they technological or methodological. Creating a new framework around AIKS on which to base ICT design and development guidelines is core not only to preserving culture and identity locally but nourishing invention of ICT more generally. Thus, our discussion explores how the processes and methods, through which we understand users and their activities, can shape design and development concepts and paradigms to emerge such a new framework. (Abstract)

**Kim, S. J., & Underberg, N. M. (2011, July). Peru Digital: Approaching interactive digital storytelling and collaborative interactive web design through digital ethnography, HCI, and digital media. In** *International Conference of Design, User Experience, and Usability* **(pp. 20-28). Springer Berlin Heidelberg.**

*Keywords*: cultural media; ethnography; folklore; participatory design

Digital ethnography is an approach to presenting real-world cultures using the features of digital environments and techniques of narrative. Digital ethnography projects exploit the computational and expressive power of new media to allow audiences to not only learn about, but to also experience something of the culture as well. This approach employs the distinctive features of digital

environments such as immersion and interactivity to create new ways to tell cultural stories and enact the research process. This paper presents experiences from a collaborative work where multidisciplinary scholars are involved in creating a cultural website called PeruDigital that presents the culture and history of Peru festivals and related folklore forms for K-12 grade students and individuals interested in Hispanic culture. In addition, this research reflects how digital ethnographers, HCI researchers, and digital media producers are work together in order to create an effective interactive cultural media model. (Abstract)

**Mainsah, H., & Morrison, A. (2014, October). Participatory design through a cultural lens: Insights from postcolonial theory. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts*. Volume 2 (pp. 83-86). ACM.**

*Keywords*: participatory; position; postcolonial; power; transnational

This paper examines challenges faced in participatory design's confrontation with cultural complexity in contexts of intercultural encounter and transnational exchange. We argue that there is need for more elaborate approaches to culture, technology, and participation in relation to participatory design. By examining issues at the crossroads between knowledge and power, agency and representation we identify a variety of ways in which Postcolonial Theory might inform Participatory Design. (Abstract)

**Martinez, C., Kemp, R., Kemp, R., French, J., & Esler, R. (2014, October). Radio Healer: Hacking the Wii remote to perform Indigenous re-imagined ceremony. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts*. Volume 2 (pp. 171-172). ACM.**

*Keywords*: No keywords

Radio Healer is a performance project in residence at thePueblo Grande Museum in Phoenix, Arizona. During Radio Healer performances, Indigenous electronic tools (many of which are created from salvaged materials and hacked Nintendo Wii Remotes) are performed together with traditional Indigenous instruments. The convergence of traditional and contemporary Indigenous instruments demonstrates value-laden tensions between notions of what is considered traditional and contemporary. At the same time Radio Healer illustrates that despite these tensions, traditional and contemporary technology can connect to each other in useful and meaningful ways (Figure 1). By creating this rivaling complexity, Radio Healer provides an Indigenous ground for inclusive public dialogues. Following performances, project artists facilitate dialogues that provide opportunities for audience interpretations of the performance, which often unpack Radio Healer as a metaphor for various lived experiences within the contexts of place, connected knowledge, culture, relationships, and pervasive media. (Abstract)

**Muscat, M. (2013, April). Blackgammon: A grounded participatory design of a preconception health promotion'alternate reality game'for adolescent Indigenous Australian women. In *CHI'13 Extended Abstracts on Human Factors in Computing Systems* (pp. 1949-1952). ACM.**

*Keywords*: alternate game reality; grounded theory; Indigenous Australians; participatory design; preconception health promotion

I first discovered Alternate Reality Gaming (ARG) after reading Jane McGonigal's "Reality is Broken: Why games make us better and how they can change the world" and I was intrigued. Leveraging social networking tools and mobile devices, ARG promote collaborative gameplay, which encourages players to participate in problem solving and the co-creation of knowledge, which can be applied in the context of real world issues. This suggests there is opportunity for the players to be empowered through this process. This motivated me to think how ARG could be used to engage the participation of adolescent Indigenous Australians and empower them to address some of their most challenging health issues. This study investigates the participatory design and play of an ARG to engage adolescent Indigenous Australians, to empower them to participate in preconception health promotion for the improvement maternal and infant health outcomes in their communities. (Abstract)

**Okamoto, M., Komatsu, H., Gyobu, I., & Ito, K. (2007, July). Participatory design using scenarios in different cultures. In *International Conference on Human-Computer Interaction* (pp. 223-231). Springer Berlin Heidelberg.**

*Keywords*: cross culture; information design; participatory design; scenario; situated design

In this paper we have examined the effects of scenarios from a participatory design and cross-cultural perspective. The Scenario Exchange Project was an international workshop using scenarios. The participants were university students from Japan and Taiwan. The impetus behind this project was the practical demand for designers to correctly understand different cultures and design products and services. We confirmed that scenarios are effective techniques for bolstering participatory design. Furthermore, we have recognized that we must create new methods for describing the lifestyle and cultural background of personas. (Abstract)

**Papangelis, K., Chamberlain, A., & Liang, H. N. (2016, September). New directions for preserving intangible cultural heritage through the use of mobile technologies. In *Proceedings of the 18th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct* (pp. 964-967). ACM.**

*Keywords*: cultural preservation; design; Indigenous; intangible cultural heritage; mobile technologies

While many cultural heritage projects currently exist, few explore the full potential of mobile technologies as a mechanism to explore intangible heritage as a way to preserve culture. This paper outlines three distinct areas necessary for the design, development and application of mobile technologies within this domain. We represent these as: a) The documentation of traditions within their unique context, as articulated by the represented community-co-curated; b) The translation of traditions and their modes of expression into emerging technology-based designs; c) Co-design and ethnography as approaches to build meaningful mobile experiences. (Abstract)

**Plimmer, B., He, L., Zaman, T., Karunanayaka, K., Yeo, A. W., Jengan, G. & Do, E. Y. L. (2015, April). New interaction tools for preserving an old language. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 3493-3502). ACM.**

*Keywords*: capacitive tangibles; fabrication; preservation of language; tui

The Penan people of Malaysian Borneo were traditionally nomads of the rainforest. They would leave messages in the jungle for each other by shaping natural objects into language tokens and arranging these symbols in specific ways -- much like words in a sentence. With settlement, the language is being lost as it is not being used by the younger generation. We report here, a tangible system designed to help the Penan preserve their unique object writing language. The key features of the system are that: its tangibles are made of real objects; it works in the wild; and new tangibles can be fabricated and added to the system by the users. Our evaluations show that the system is engaging and encourages intergenerational knowledge transfer and thus has the potential to help preserve this language. (Abstract)

**Rodil, K., Winschiers-Theophilus, H., Bidwell, N., Eskildsen, S., Rehm, M., & Kapuire, G. (2011). A new visualization approach to re-contextualize Indigenous knowledge in rural Africa. *Human-Computer Interaction–INTERACT 2011*, 297-314.**

*Keywords*: 3D visualization; Africa; design; Indigenous knowledge; rural

Current views of sustainable development recognize the importance of accepting the Indigenous Knowledge (IK) of rural people. However, there is an increasing technological gap between Elder IK holders and the younger generation and a persistent incompatibility between IK and the values, logics and literacies embedded, and supported by ICT. Here, we present an evaluation of new technology that might bridge generations and preserve key elements of local IK in Namibia. We describe how we applied insights, generated by ethnographic, dialogical and participatory action research, in designing a structure in which users can store, organize and retrieve user-generated videos in ways that are compatible with their knowledge system. The structure embeds videos in a scenario-based 3D visualization of a rural village. It accounts for some of the ways this rural community manages information, socially, spatially and temporally and provides users with a recognizable 3D simulated environment in which to re-contextualize de-contextualized video clips. Our formative in situ evaluation of a prototype suggests the visualization is legible to community members, provokes participation in design discussions, offers opportunities for local appropriation and may facilitate knowledge sharing between IK holders and more youthful IK assimilators. Simultaneously differing interpretations of scenarios and modeled objects reveal the limitations of our modeling decisions and raises various questions regarding graphic design details and regional transferability. (Abstract)

**Rodil, K., Winschiers-Theophilus, H., & Jensen, K. L. (2012, August). Enhancing cross-cultural participation through creative visual exploration. In *Proceedings of the 12th Participatory Design Conference: Research Papers*. Volume 1 (pp. 81-90). ACM.**

*Keywords*: 3D; Indigenous knowledge; participatory design; visualization.

Designers, like artists, fuse learned skills with intuition formed over their past experiences to unfold their creativity. Continuous interactions between the designers, their creations, and their informing and receiving environment lead to alignment and harmonisation. However, we observe that displaced designers in an unfamiliar context can no longer blindly rely on their insights only to create acceptable artefacts. In this paper we depict the journey of a young western designer, who accepted the challenge to co-design a 3D graphics visualisation of a small village in Southern Africa. We have observed that the 3D graphics visualisation has significantly increased participation and facilitated

co-creation of meaning at the interface of different cultures rather than just being an end product. Not only do we he have to learn to 'see' what the village elders see but also experience a paradigm shift in design and evaluation methods. Based on personal interrelations and immanent differing principles the interactions among the participants are renegotiated continuously during the design process. (Abstract)

**Rodil, K., Winschiers-Theophilus, H., Kapuire, G. K., Stanley, C., & Chivuno-Kuria, S. (2014, October). Participatory exploration of digitalizing cultural content: Getting married. Are we ready? In** *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts.* **Volume 2 (pp. 93-97). ACM.**

*Keywords*: Namibia; cultural content; digital storytelling; participatory design

This paper describes a joint investigation of a Herero wedding ceremony as a sample of cultural content to be digitalized. We have through participatory exploration scrutinized embodied media bias and representation with Herero elders in Namibia. One finding is that this method has enabled the elders to be active agents in the digital portrayal of their culture. (Abstract)

**Rodil, K., Winschiers-Theophilus, H., Stanley, C., Kapuire, G. K., & Rehm, M. (2014, December). An approach to user interface design with two Indigenous groups in Namibia. In** *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: The Future of Design* **(pp. 460-469). ACM.**

*Keywords*: categorization; cultural; Indigenous knowledge; participatory design; taxonomy; user model; user-interface

It has been widely reported that interactions with and expectations of technology differ across cultural contexts. Concepts such as 'usability' have shown to be context-dependent, thus user interfaces intuitive to one group of users appears counter-intuitive to the others. In an attempt to localise a user interface of a tablet based system aimed at preserving Indigenous Knowledge for rural Herero communities, we present findings from two sites in Namibia, complementing prior research. Participants who had little or no previous experience with technologies informed our endeavour of aligning local Indigenous knowledge practices with digital object taxonomies. We present a method (picture card sorting) of discovering taxonomies that influence the users' interaction with a prototype system to preserve Indigenous knowledge. Finally we describe the design implications, a new design approach based on findings and present preliminary evaluations in a collaboration village as well as design export results with another Indigenous group. (Abstract)

**Rodil, K., Winschiers-Theophilus, H., Jensen, K. L., & Rehm, M. (2012, October). Homestead creator: A tool for Indigenous designers. In** *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design* **(pp. 627-630). ACM.**

*Keywords*: 3D visualization; HCI; Indigenous knowledge; participatory design

The article presents in-situ findings of introducing a tablet prototype, with touch interaction and 3D graphical visualizations, to empower knowledgeable village elders in Namibia to locally re-create a 3D graphical context for previously recorded video clips of Indigenous practices and narratives. Findings indicate that tablets enable those Indigenous users to partake in design sessions more

equally than with laptops and other input devices. Through a GUI design example we illuminate the unique opportunities and challenges in designing in the space where cultures meet. (Abstract)

**Sabiescu, A. G., David, S., van Zyl, I., & Cantoni, L. (2014, October). Emerging spaces in community-based participatory design: Reflections from two case studies. In** *Proceedings of the 13th Participatory Design Conference: Research Papers*. **Volume 1 (pp. 1-10). ACM.**

*Keywords*: community-based design; design for participation; interdisciplinarity; third space participatory design

This paper engages with issues of universality and locality in the context of community-based participatory design (PD), and focuses on the challenges and opportunities associated with incorporating local views and forms of participation in the design process. The notion of 'designing for participation' is advanced as a quintessential perspective for approaches in which design practices are re-configured from a community-centric standpoint. Building on insights from PD and community development studies, as well as on empirical evidence from two community design studies, we argue that designing for participation appears to be located in a space between the designer's and local views of participation, which are at times both ambiguous and conflicting. To overcome these tensions, we argue for the importance of engaging critically and reflectively with PD in community contexts, and in this process capitalising on disciplinary dialogues that can expand the viewpoint from which PD projects are negotiated and evaluated. (Abstract)

**Shepherd, M., Fleming, T., Lucassen, M., Stasiak, K., Lambie, I., & Merry, S. N. (2015). The design and relevance of a computerized gamified depression therapy program for Indigenous Māori adolescents.** *JMIR Serious Games*, **3(1), e1.**

*Keywords*: computerized cognitive behavioral therapy; Maori; Indigenous populations; depression; consumer opinions; participatory design

Background: Depression is a major health issue among Maori Indigenous adolescents, yet there has been little investigation into the relevance or effectiveness of psychological treatments for them. Further, consumer views are critical for engagement and adherence to therapy. However, there is little research regarding Indigenous communities' opinions about psychological interventions for depression.

Objective: The objective of this study was to conduct semistructured interviews with Maori (Indigenous New Zealand) young people (taitamariki) and their families to find out their opinions of a prototype computerized cognitive behavioral therapy (cCBT) program called Smart, Positive, Active, Realistic, X-factor thoughts (SPARX), a free online computer game intended to help young persons with mild to moderate depression, feeling down, stress or anxiety. The program will teach them how to resolve their issues on their own using Cognitive Behavioural Therapy as psychotherapeutic approach.

Methods: There were seven focus groups on the subject of the design and cultural relevance of SPARX that were held, with a total of 26 participants (19 taitamarki, 7 parents/caregivers, all Maori). There were five of the groups that were with whanau (family groups) (n=14), one group was with

Maori teenage mothers (n=4), and one group was with taitamariki (n=8). The general inductive approach was used to analyze focus group data.

Results: SPARX computerized therapy has good face validity and is seen as potentially effective and appealing for Maori people. Cultural relevance was viewed as being important for the engagement of Maori young people with SPARX. Whanau are important for young peoples' well-being. Participants generated ideas for improving SPARX for Maori and for the inclusion of whanau in its delivery.

Conclusions: SPARX computerized therapy had good face validity for Indigenous young people and families. In general, Maori participants were positive about the SPARX prototype and considered it both appealing and applicable to them. The results of this study were used to refine SPARX prior to it being delivered to taitamariki and non-Maori young people. (Abstract)

**Soro, A., Brereton, M., Lee Hong, A., & Roe, P. (2015, December). Bi-cultural content publication on a digital noticeboard: A design and cultural differences case study. In *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction* (pp. 217-221). ACM.**

*Keywords*: collectivism; cultural differences; digital noticeboard; HCI4D; ICT4D; literacy; moderation; time

We present our observations of Aboriginal Australian practices around a custom digital noticeboard and compare our insights to related research on cultural differences, literacy and ICT4D. The digital noticeboard was created, upon a request by the community Elders, to foster communication across the community. The initial design, informed by discussions and consultations, aimed at supporting the local Aboriginal language and English, both in written and spoken form, at supporting the oral tradition, and at accommodating for different perceptions and representations of time. This paper presents observations about the first encounters with the digital noticeboard by those members of the community that took part in its conceptualization. Such observations reinforce existing knowledge on such cultural phenomena as collectivism and time perception, issues related to literacy, moderation and censorship. We contribute to framing such knowledge within a concrete case study and draw implication for design of tools for bi-cultural content publication. (Abstract)

**Soro, A., Brereton, M., Taylor, J. L., Hong, A. L., & Roe, P. (2016, November). Cross-cultural dialogical probes. In *Proceedings of the First African Conference on Human Computer Interaction* (pp. 114-125). ACM.**

*Keywords*: Aboriginal Australia; cultural; dialogical; Indigenous knowledge; noticeboard; probe; technology; post-colonial computing

This paper explores the use of probes in a very remote Australian Aboriginal community where the rich traditional and post-colonial culture is worlds away from the urban Australian home of the research team. Cultural probes and technology probes have seen an enormous uptake in HCI as methods to develop inspiration from and insights into culture. Typically they are left behind, as unmanned probes, to collect and send data (or inspiring contributions) back to the design team. We investigate how probes align with Indigenous ways of knowing, in particular a preference for situated knowledge creation, orality and co-presence. Through a case study we articulate how a technology

probe became used as a means to engage in dialogue and co-creation with the local community. We found that co-presence of researchers and participants is crucial to foster engagement, unanticipated insights into culture and openings beyond the original problem-solution design framework. To highlight this, departing from the original conceptualization of probes, we propose and discuss the concept of manned cross-cultural dialogical probes. (Abstract)

**Ssozi-Mugarura, F., Blake, E., & Rivett, U. (2017). Codesigning with communities to support rural water management in Uganda.** *CoDesign,* **13(2), 1-17.**

*Keywords*: co-design; communities; water management; values; intermediaries; reciprocity; appropriation

The use of information and communication technologies (ICTs) in developing regions has gained momentum due to their increasing affordability, particularly in rural areas where other ICT infrastructures for information management are often non-existent. Giving potential technology users, the opportunity to actively engage and contribute to the design of an artefact increases adoption and sustainable use. In this paper, we illustrate our application of community-based codesign (CBCD) that led to the development of an ICT intervention to support water management in three rural communities in Uganda. The community-based system helps water managers to track water users, payments and expenditures in a bid to improve transparency, accountability and trust. We present research learnings of the method and how engagement with rural communities can be improved through the use of intermediaries and paying more attention to community values as well as exercising ethics of reciprocity in community-based ICT initiatives. (Abstract)

**Stanley, C., Winschiers-Theophilus, H., Blake, E., Rodil, K., Kapuire, G. K., Maasz, D., & Chamunorwa, M. (2016, September). Formulating "the obvious" as a task request to the crowd: An interactive design experience across cultural and geographical boundaries. In** *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops***. Volume 2 (pp. 86-87).**

*Keywords*: community-based co-design; crowdsourcing; rural communities

The exhibition will demonstrate the technologies that were co-designed with Namibian rural communities with the main objective of preserving Indigenous Knowledge (IK) and Cultural Heritage (CH). Set up as a simulation we showcase how rural communities collect information (images, text, audio, video) about their traditional items or events to be crowdsourced to graphic designers. The graphic designers then model the items in 3D format and send back the rural communities for evaluation and acceptance to be integrated into the existing technologies. Conference participants will be engaged in exploring the technologies as well as discussions around the specific usage and design challenges. (Abstract)

**Taylor, J. L., Soro, A., Brereton, M., Hong, A. L., & Roe, P. (2016, November). Designing evaluation beyond evaluating design: Measuring success in cross-cultural projects. In** *Proceedings of the 28th Australian Conference on Computer-Human Interaction* **(pp. 472-477). ACM.**

*Keywords*: HCI4D; cross-cultural; designing futures; evaluation

This paper considers the issue of evaluation in cross-cultural contexts, where the focus on Western principles of technology quality can be problematic. We present a case study of designing a Digital Community Noticeboard with an Australian Aboriginal community, and discuss how its evaluation may be better approached in terms of 'designing futures'. Rather than viewing evaluation as the validation of a designed artefact, our approach is focused on mapping progress towards a vision for a future world that shapes, and is shaped by the noticeboard, as the two have mutually evolved. The resulting insights go beyond the technical and lead to a better understanding of how the noticeboard may fit with everyday practices, local values and social protocols, and issues of sustainability. This shift in perspective helps to foreground these socio-technical factors and research problems that may otherwise pass unnoticed. (Abstract)

**Taylor, J. L., Soro, A., Hong, A. L., Roe, P., & Brereton, M. (2016, November). Designing for cross-cultural perspectives of time. In *Proceedings of the First African Conference on Human Computer Interaction* (pp. 219-224). ACM.**

*Keywords*: Aboriginal; cross-cultural; noticeboard; time

We present ongoing work that seeks to understand cross-cultural perspectives of time, and reflect these temporalities in the participatory design of a cross-cultural Digital Community Noticeboard. Time is a socio-cultural phenomenon that is experienced differently across cultures. Time practices in non-Western cultures can operate in tension with common interfaces for clocks and calendars, whereas other perspectives of time are underrepresented in interactive system design. We conducted community interviews and design workshops to investigate such themes. Two key design principles arising are that 1) time is social and relational, and 2) time is implicit and flexible. We propose ways to incorporate these principles in interface design. (Abstract)

**Walker, K., Underwood, J., Waema, T., Dunckley, L., Abdelnour-Nocera, J., Luckin, R. & Camara, S. (2008, April). A resource kit for participatory socio-technical design in rural Kenya. In *CHI'08 Extended Abstracts on Human Factors in Computing Systems* (pp. 2709-2714). ACM.**

*Keywords*: agriculture; culture; development; mobile; usability

We describe our approach and initial results in the participatory design of technology relevant to local rural livelihoods. Our approach to design and usability proceeds from research in theory and practice of crosscultural implementations, but the novelty is in beginning not with particular technologies but from community needs, and structuring technology in terms of activities. We describe our project aims and initial data collected, which show that while villagers have no clear mental models for using computers or the Internet, they show a desire to have and use them. We then describe our approach to interaction design, our expectations and next steps as the technology and activities are first introduced to the villages. (Abstract)

**Winschiers, H. (2006, January). The challenges of participatory design in a intercultural context: designing for usability in Namibia. In *Proceedings of the Participatory Design Conference PDC 06* (pp. 73-76).**

*Keywords*: usability; cross-cultural design; sustainable development; cultural appropriation

The need for participation in development projects has been recognised broadly. Thus a great number of successful participatory design practices and principles have evolved mainly in the northern hemisphere. However still too many project initiatives in developing countries collapse although participatory techniques were used. Crossing disciplinary or cultural boundaries implies that one should reconsider established assumptions, concepts and habits that were taken for granted. Thus as much as designed products have to be evaluated in the local context so do design methods, techniques and tools. This paper therefore explores the cultural margins of Information Technology design and the challenges of expanding the boundaries across cultures. A theoretical framework supported by a Namibian case study foster the necessity of an acculturated design in context if striving to develop usable Information Systems. (Abstract)

**Winschiers-Theophilus, H., & Bidwell, N. J. (2013). Toward an Afro-Centric Indigenous HCI paradigm. *International Journal of Human-Computer Interaction,* 29(4), 243-255.**

*Keywords*: No keywords

Current human–computer interaction (HCI) paradigms are deeply rooted in a Western epistemology that attests its partiality and bias of its embedded assumptions, values, definitions, techniques, and derived frameworks and models. Thus tensions created between local cultures and HCI principles require researchers to pursue a more critical research agenda within an Indigenous epistemology. In this article an Afro-centric paradigm is presented, as promoted by African scholars, as an alternative perspective to guide interaction design in a situated context in Africa and promote the reframing of HCI. A practical realization of this paradigm shift within our own community-driven design in Southern Africa is illustrated. (Abstract)

**Winschiers-Theophilus, H., Bidwell, N. J., & Blake, E. (2012). Altering participation through interactions and reflections in design. *CoDesign*, 8(2-3), 163-182.**

*Keywords*: community participation; rural interaction design; African context; community-based; sustainable development; cross-cultural design; Indigenous knowledge; local appropriation; action research; dialogical methods

In this paper, we illustrate through a set of examples how our own conceptualisation of participatory design (PD) and associated tools and techniques transforms within the design process itself. Co-designing with African rural communities has brought to light our many assumptions and intentions underlying commonly used methods and principles of PD. While genuinely striving for user involvement these same methods can hinder a truly participatory approach to design. We have learned much through our encounters and continuous reflections in various projects with southern African rural communities and seek to share our experiences in one particular, current project which led us to interrogate and revise our existing conceptions of PD. We also aim to infuse the evolution of PD with insights from Africa and cross-cultural design so that PD can better serve diversity globally. (Abstract)

**Winschiers-Theophilus, H., Fendler, J., Stanley, C., Joubert, D., Zimmermann, I., & Mukumbira, S. (2008, December). A bush encroachment decision support system's metamorphosis. In *Proceedings of the 20th Australasian Conference on Computer-Human Interaction: Designing for Habitus and Habitat* (pp. 287-290). ACM.**

*Keywords*: Namibia; Southern Africa; wiki; community value design; cross-cultural design; cross-cultural usability; cultural appropriation; decision support system; recommendation support system

Since the inception of our bush-encroachment decision support system, we have gone through many cycles of adaptations while striving towards what we believed to be a usable system. A fundamental difference between community based users and individualistic users necessitates a change in the design and evaluation methods as well as a community agreement of concepts and values guiding the design. In this paper we share the lessons learned along the story depicting the metamorphosis of a bush encroachment decision support system in Southern African rangelands. Above and beyond community members participating in the design and evaluation of the system, they establish the community grounded values determining the system's quality concepts such as usability. (Abstract)

**Zulaikha, E., & Brereton, M. (2013, September). Communication choices to engage participation of rural Indonesian craftspeople in development projects. In *IFIP Conference on Human-Computer Interaction* (pp. 780-787). Springer Berlin Heidelberg.**

*Keywords*: communication mode; participatory design; participatory development; rural craftspeople

In participatory design projects, maintaining effective communication between facilitator and participant is essential. This paper describes the consideration given to the choice of communication modes to engage participation of rural Indonesian craftspeople over the course of a significant 3 year project that aims to grow their self-determination, design and business skill. We demonstrate the variety and subtlety of oral and written forms of communication used by the facilitator during the project. The culture, the communication skill and the influence of tacit knowledge affect the effectiveness of some modes of communication over the others, as well as the available infrastructure. Considerations are specific to the case of rural Indonesian craftspeople, but general lessons can be drawn. (Abstract)