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Challenges and Opportunities in Conducting and Applying Design Research beyond Global North to the Global South

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Abstract: *With an increase in international projects, comes increased opportunities for design researchers to contribute to research that tackles Sustainable Development Goals in the Global South. Nevertheless, the role of design within this context is disparate and detached, with very limited design literature on the subject. As such, this paper has identified the key challenges and barriers that design researchers face in conducting and applying design research in a Global South Context. Based on a workshop with design research experts doing research in Global South, the literature and lessons learnt from running a design-led project in Ghana, we are presenting and discussing 45 challenges grouped under 13 themes. We envisage that these will form the first step towards developing strategies for mitigating these challenges and help current and future design researchers to engage further in international research in the Global South.*

Keywords: Global South; Design Research; Sustainable Development Goals; Global Health.

1. Introduction

The design community, along with other research communities, are called upon to tackle the complex global challenges framed in the United Nation's 17 Sustainable Development Goals. However, these require design research to be conducted in Global South contexts, in low-middle income countries (LMICs), where to date design research has been very limited or non-existent.

This is reflected in the funding opportunities available for international research, particularly those focused on the Global South (Bhutta, 2002), which employ the SDGs as a Framework for research (Hák et al., 2016), for example, the Global Research Challenge Fund in the UK, the Newton and British Academy Funds.

*Conducting design research in the Global South, therefore, introduces a new context where cultural, social, religious as well as administrative practices often pose challenges but can create new opportunities for researchers from across the globe. As such this paper relates to the **Co-Creation, Processes** and **Situations** conference themes. In terms of these themes, applying design research that addresses SDGs in Global South contexts requires cross-disciplinary collaboration, navigating cultures, diversity, ethics, and the habits of different design communities. This in turn requires new processes or their adaptation to deal with challenges related to multiple voices, participation and power distribution, the role of communities and public organisations, and the building of international Global North-Global South partnerships in and for design research.*

In this paper we present the challenges and lessons learned from a) previous international design-led/design-related research projects/studies from the literature; b) an international workshop on the subject, which took place at IASDR 2019 in September 2019 in Manchester, UK; and c) a Global Challenge Research Fund Design-led research project. We then offer a discussion of these challenges and the opportunities for design researchers.

2. Context and Related Work

Scientists and researchers today, are turning their focus to address the global challenges facing the developed, and more crucially, the developing world. Design research is starting to contribute to this field and there is a need for more design research to be directed towards addressing the challenges set by the UN.

The Sustainable Development Goals (SDGs) comprise 17 goals and 169 targets. They are intended to be global in embodying a universally shared common vision of progress towards a safe, just and sustainable space for all human beings to thrive on the planet. They reflect the moral principles that no-one and no country should be left behind, and that everyone and every country should be regarded as having a common responsibility for playing their part in delivering that vision (Osborn et al., 2015). The goals are broad based and interdependent. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Design's ability to engage real people and communities, understand everyday problems and implement the 'right' solution, not just the 'newest technology', enables it to act as a bridge between disciplines. It is an important and growing voice in this field, that helps to bridge the gap between the rapid advancements in science, technology and engineering with people

and contexts on an everyday level. Thus, design can take a leading role in research that addresses the SDGs. Despite this, research into the role of design in tackling the Sustainable Development Goals is disparate and unclear. As such, there is a need to identify the key challenges and barriers design researchers face within the Global South context in order to develop strategies for mitigating these.

The literature has articulated a set of funding, organisational and paradigmatic constraints on research partnerships with potential negative consequences at institutional and individual levels (Godoy-Ruiz et al., 2016). The issues covered include the selection and training of local personnel, the recruitment of participants, sampling challenges, participants' compensation, survey methods and implementation, elicitation methods, the literacy rate of the population, and security/ safety issues in developing countries (Durand-Morat et al., 2015). The most frequently mentioned challenges in conducting research in Global South contexts relate to access to data, data collection issues, diversity of the region, language barriers, and lack of research support infrastructure (Lages et al., 2015).

The majority of past and current research activity in the Global South has traditionally focused on the health research sector (Berndtson et al., 2007; Casale et al., 2011; Atkins et al., 2016; Franzen et al., 2017). As such, most of the research challenges presented in the literature have originated and have been framed for researchers engaging in health research activity. Lessons learnt from these may still be useful for design researchers, who are in the process of engaging with research in Global South contexts, but there is a clear and unmet need for further input from the design research community. Moreover, many professionals involved in North-South development research projects lament the lack of studies on such research partnerships to support critical reflection and the refining of approaches to collaboration.

This paper addresses the lacuna in the literature (Bradley, 2007; Teye, 2012), and collates a design research perspective on the challenges of designing, applying and conducting design research in the Global South.

3. Methodology

3.1 Design Research Workshop
Through a series of interactive workshop activities, the authors explored the challenges of applying design research in the Global South and invited workshop participants to share their own experiences.

The workshop objective was to form an initial map of emerging challenges and opportunities in the application of design research in LMICs. It addressed the following research question: 'How is design research changed in the transitions between the Global North and the Global South?'.

Workshop participants were engaged in a series of hands-on activities, over 120 minutes, that culminated in the preparation of a challenges map. Following a brief presentation of challenges and lessons learned from applying design research in Africa in the multi-disciplinary Dust Bunny research project (funded by UKRI AHRC) and from the literature; Participants working in pairs or small groups were assigned to three tables (working stations), each one corresponding to a specific design phase (pre-design, design and post-design) – See Figure 1.
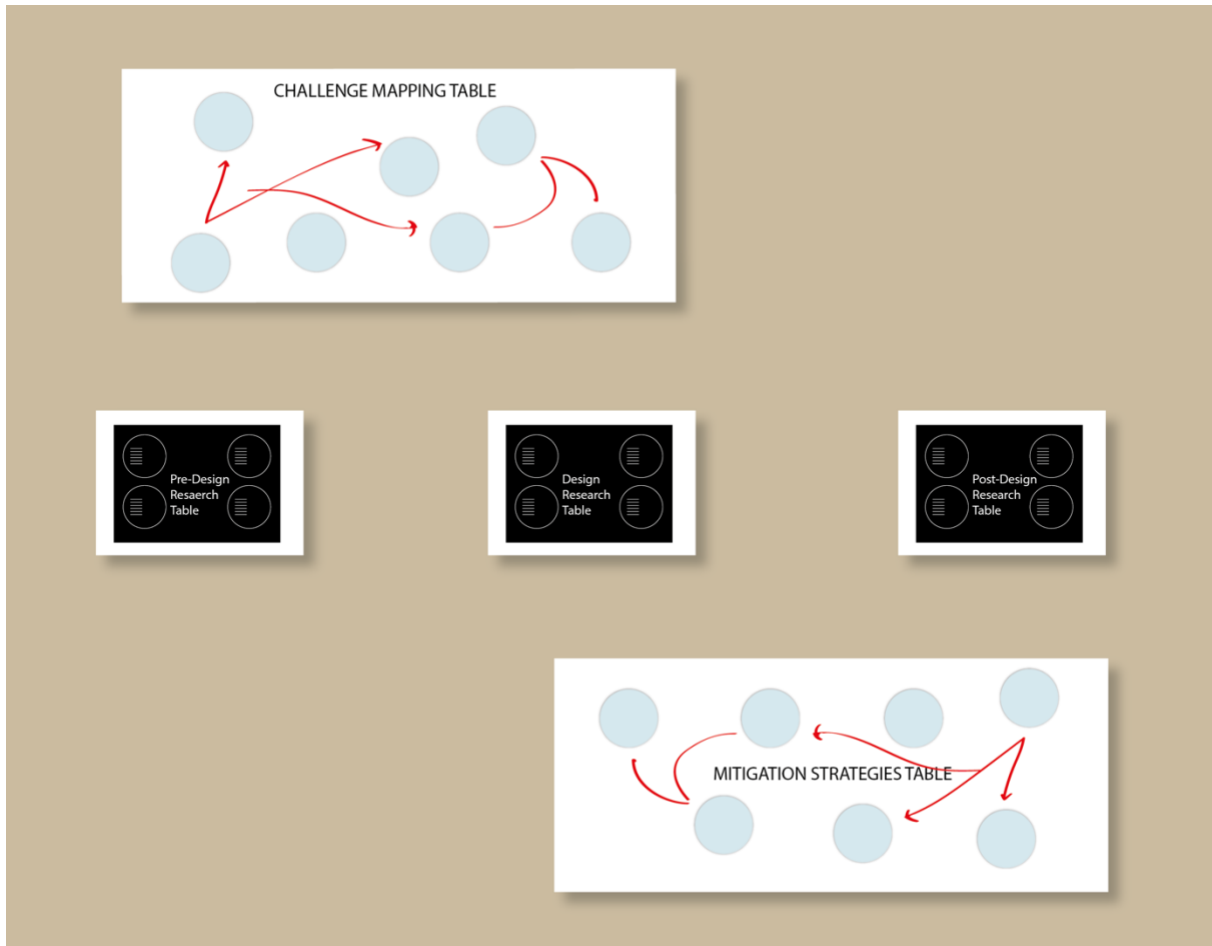

Figure 1   Workshop Set-up for mapping Challenges and Mitigation Strategies

Each group alternated along the workstations to ensure that they contributed to each workstation. Responding to the questions presented by the prompts on the working stations, each group added their own experiences and knowledge on the challenges of conducting design research in the Global South. This led to a collective map of challenges, which participants used as a basis for a reflection on mitigation strategies. Everyone was involved in moments of discussions, during which we reflected on the findings of the day and the next steps.

Challenges and Opportunities in Conducting and Applying Design Research beyond Global North to the Global South

The workshop took place at the Manchester Metropolitan University, where the IASDR 2019 Conference was hosted and it involved 8 participants with expertise in conducting design research in the Global South.

Figure 2   Mapping of challenges and clustering into themes during the workshop

3.2 The Dust Bunny project

The Dust Bunny project's specific aim was to develop an understanding of the home as a source of infection from antimicrobial resistant (AMR) bacteria carried by dust by exploring hygiene practices across different home environments in Ghana. The project had the ultimate goal of reducing potential bacterial infection in the home environment in order to reduce AMR. In adopting these aims, the Dust Bunny project's aspirations were aligned to Sustainable Development Goal 3, target 3d (United Nations, 2016), and its desire to strengthen the capacity of a developing country in making risk reduction interventions in response to global health issues.

The Dust Bunny project combined design and microbiological and molecular ecology methods in an innovative mixed-method approach. A traditional survey design, a design ethnography,

a cultural probe and a microbiological analysis were planned to provide insights for codesign workshops in which new cleaning practices might be developed to minimise any potentially harmful bacteria and particularly AMR bacteria present in the home environments in the Greater Accra Region of Ghana (Tsekleves et al., 2019).

The procession of methods; from survey instrument to design ethnography and cultural probe, made in parallel with a microbiological analysis, was designed to provide a range of insights into contemporary cleaning practices in Accra. These insights were then to be used by participants to codesign, in a one-day workshop, 'new' cleaning practices for a thirty-day intervention, which would be followed by another round of microbiological analysis. Plans, however, rarely survive an encounter with reality, and though the structure of the research design survived mostly intact, the deployments of some of the individual methods were subject to extensive change.

3.3 Workshop Findings

A total of 45 individual challenges were identified during the workshop. Following discussion and a mapping exercise, these were then clustered into 13 themes, as presented in Table 1 below. These have been further analysed and grouped, following the workshop, into 4 groups of inter-related themes.

More precisely, challenges related to power, trust, consent and resistance to data capture technologies were discussed. These included specific issues, such as participant resistance to use video/audio-based methods, gaining access to community gatekeepers, getting participant consent, power hierarchy between researchers and research participants, as well as several others. Research methods were also extensively discussed with themes focusing on qualitative research literary amongst the North-South research partnership and local knowledge construction. Among others concerns, these related to challenges around how knowledge is framed in local societies, differences in abstract thinking and data collection robustness.

Challenges around the formation and maintenance of the research partnership also emerged. The main themes revolved around collaboration, communication and gender, with discussion touching upon issues of power dynamics and hierarchy, limited Internet access for communication and having an 'all male' research team. In the Dust Bunny project, this was compensated for by recruiting all female Research assistants/data collectors. The impact and legacy of the research was also widely debated, focusing on issues of relatability of the research and its outcomes for different beneficiary groups. Challenges under these themes included communicating findings to stakeholders and beneficiaries, creating legacy after the project end, and the relevance of research to local challenges and communities, as well as several other.

Challenges and Opportunities in Conducting and Applying Design Research beyond Global North to the Global South

Table 1: Challenges and themes in conducting design research in the Global South as identified during the workshop

	Themes	Challenges
Research Participants and Fieldwork	Resistance to data capture technologies & methods	Lack of exposure to video tech related to trust issues
		Research participant resistance to recording technologies
		Resistance to use video/audio-based methods
	Power	Implied power of the researchers
		Identity, possessions, the body
	Trust	Access to community gatekeepers
		Partnership as point in gatekeeping
		Gatekeepers – relationship building over time -> trust
		Intrusion
		Participant overexposure to research
		Cultural social sensitivity
	Consent	Consent is slow process
		Data collection difficult if people won't sign paper records
		Consent leveraged and continual negotiation
		Ethics: where do we apply for?
		Literacy level, impacting consent …
Research Methods	Truth	Local research methods knowledge
		How knowledge is framed in local societies
		Gaining local context for adjusting research methods
		Individual vs group behaviour norms
	Knowledge construction, Otherness	Cultural differences in defining 'truth'
		Abstract thinking – lack of education
		Abstract thinking is different (culturally)
	Qualitative research literacy	Research methods robustness
		Robust data collection
		Qualitative data analysis: priorities, patterns
		Where you process the data affects how you process the data
Partnership	Collaboration	Collaboration agreement setup
		Power dynamics and hierarchy
		Permission to change design research methods
		How do you adapt methods for comparative purposes
	Communication	Infrastructure: (communication technology) lack thereof is a limitation
		Limited Internet access for communication
	Gender	Gender perspective / Gender bias
		'All male' research team
Impact and Legacy	Outcomes (different for stakeholders)	Communicate findings to stakeholders and beneficiaries
		Recording stories which are important for storytelling and impact
		Record data from the start to demonstrate impact
		How to best measure impact and follow up
	Legacy	One thing to report, another to involve in the insight
		Create legacy after the project end
		Disseminate locally: which methods
	Relatability	Relevance
		Sense of topical boundaries (not believing the Q is relevant)
		Our academic delivery of results may be unusable to participants

4. Discussion

In this section the authors discuss the workshop findings in relation to the literature and our own experiences in applying design research methods in the Global South, under the Dust Bunny project.

4.1 Research Participants and Fieldwork

When it comes to conducting field work involving research participants, such as rapid ethnography, observations, interviews, etc., researchers face challenges related to lack of trust and perceived security. Some of these concerns are related to providing safeguards and peace of mind to teams of enumerators and field personnel (Cheema et al., 2018) or to concerns about local social unrest at the time of the fieldwork (Mathee et al., 2010). This clearly impacts negatively on the data gathering process, as it often leaves researchers with little choice but to change their initial data sampling methods, sometimes on the fly, with implications for data analysis (Mathee et al., 2010). For instance, the Dust Bunny project demonstrated that community participation in design research is complicated by issues of social judgement, safety and security. These combine to create a climate of mistrust among participants who are cognizant of the moral nature of cleaning (Curtis et al, 2003; Bloomfield et al 2009) and keenly guard their personal privacy. This impacts methods such as direct observation, which have greater validity than those obtained through questionnaire interviews (Curtis et al, 2011), with participants showing resistance to the use of recording technologies in the home and denying, or minimizing, access.

The biggest challenge though is research participant overexposure to research. The increase in funding of research in Global South countries and especially low-income and informal communities has seen some being invited to provide data in too many studies. This has also attracted elements outside the community posing as researchers in order to gain access to households, often leading to thefts and other illegal activities. Similar concerns have been raised by participants during the Dust Bunny project, as evident from the quote below, as well as in the literature.

> "A neighbour allowed a well-dressed man into her home with the aim of conducting interview but ended up raping a daughter and stole some few items and bolted away. Another place they stole lab tops and phones. Some are also of the fear we might kidnap their children for ransom."

It has been reported that potential participants are sometimes afraid to allow fieldworkers onto premises due to high crime rates in many participating areas (Nel et al., 2017). In other occasions entire communities had previous bad experiences of cold-callers and fake lottery schemes, where outside people came and defrauded people of their money by promising large cash and in-kind rewards (Cheema et al., 2018). These concerns coupled with cultural and social sensitivity affect trustworthiness and pose barriers to design research fieldwork in the Global South.

Resistance to community engagement and participation as well as the use of appropriate observational research methods and technologies therefore form a particular challenge for conducting in-depth studies in some developing countries.

In the case of the Dust Bunny project, such local experiences and fears meant that the only documentation of the ethnographic sessions were field notes as people's participation became conditional on our agreement not to use audio or video recording or photography during the sessions. High levels of resistance to the use of recording technologies in the home, were informed by the larger social issues of safety and security, and acted as strong cultural barriers to recruitment and participation in Ghana. Salvador et al. (1999) note, that with limited time to access the field design ethnography draws "on a wider toolkit of ethnographic methods" that include many approaches that make use of technology. Resistance to such technologies therefore is a particular challenge for the use of design ethnography studies in a Global South context.

Gaining permission in a developing country with different social structures presents additional challenges. Gaining trust and permission to communities for participating in research, depends significantly on gaining access to community gatekeepers. Permission from chiefs, community leaders, elders or street committees is often required, and one is expected to present one's case to them, as well as to provide small gifts. Workshop participant experiences along with ours, from the Dust Bunny project and that of the literature indicate that this poses a hinderance to timely project completion, as it often leads to delays during data collection (Roberts et al., 2019). Once a contact is established, the negotiation to get access to participants is prohibitively long requiring local knowledge of the community needs and diplomacy to gain approval and support for research (Lages et al., 2015; Mathee et al., 2010).

Once gatekeeper permission is granted, then the recruitment of research participants can start. This also includes gaining their consent in participating in the research, following established research ethics procedures. Workshop findings align with the literature with regard to the range of ethical concerns found in the Global South contexts.

Questions arise as to where one should apply for ethics. Should it be in the Global South country where most of the research is taking place or in the Global North institution, which usually leads the research? The literature highlights that many ethics committees in Global South countries lack the authority and/or the capacity to monitor research in the field (Regmi et al., 2017). A lack of clear guidance in most Global South countries on the consent taking procedure poses further challenges to being able to adhere to ethics principles (Amerson & Strang, 2015; Regmi et al., 2017). This is further affected by low education levels, affecting participant's full understanding of what research entails, and also patriarchal or matriarchal social structures, which may require non-research participants to give consent for others to participate (Amerson & Strang, 2015).

Moreover, the choice of the type and the amount of incentives has ethical implications and is not an easy dilemma to resolve (Casale et al., 2011). It is important to recognise and thank people for their participation in the research. Given the low economic background of several of the Global South participants involved in research, not well-thought out incentives can have a negative impact on the participants; especially if the research focuses on low-income and informal settlement communities. Researchers may put participants at risk within their own community if they are seen as suddenly having been given monetary or other incentives of high economic value that differentiates them from others in their community.

4.2 Research Methods

The theme of Truth, in relation to how knowledge is framed within local Global South contexts was widely discussed during the workshop. The way knowledge (truths) are framed within this context often relates to the way the research methods are also framed and executed. For instance, in the Dust Bunny project, we observed a need to better understand the potential application of 'researcher' and 'guest' identities within field work in the home. As such gaining local context for adjusting research methods is important but more importantly research priorities should be determined in or rather by the South (Bradley, 2007).

Cultural differences also exist between North-South contexts regarding gender perspectives that can lead to gender bias (Berndtson et al., 2007). Added to these are cultural and social conditionings that include an emphasis on seniority and social hierarchies. Especially in forming research teams in the Global South it may be challenging to avoid an 'all male' research team, as research training may be made available primarily to males, with limited opportunities for females.

Local research methods knowledge, is therefore, a requirement when designing a research project. Even more so when running one, where relying on local personnel is crucial to ensuring that different aspects of the research are tailored to the idiosyncrasy of the population being surveyed (Durand-Morat et al., 2015). However, this is not always possible, as from discussions in the workshop and the literature, it is clear that in most partnerships in Global South countries the research protocols were written by researchers from the North with little input from southern partners (Olivier et al., 2016). This is often due to South partners having limited time to devote to the design of research studies, and often have less methodological knowledge concerning research design (Lages et al., 2015).

Language poses another barrier in conducting research in a Global South context. This is the case even when English is the official language, spoken at a national level. Experiences shared by workshop participants matched our own in the Dust Bunny project; where although English was the official language our version of English (British English) was different from the local English (Ghanaian English). For example, in presentations, workshops and other interactions with research participants UK-based researchers had do slow down

their speech speed to match that of the local one and often they would have a local colleague repeating what was said (i.e. workshop instructions, etc.) with the local accent in order for it to be fully understood.

Also, in collaborative research where different languages exist amongst the partners, English language (or any other former colonial language) is commonly used between research implementing partners and funding agencies (Regmi et al., 2017). As such, it is a common practice for researchers from Global South countries to draft research protocols, tools used such as questionnaires and consent forms in English. However, transporting a questionnaire across national and linguistic borders means more than translating items accurately from one language to another (Rubinstein-Ávila, 2009; Cheema et al., 2018). Translation does not always ensure that the research method will convey the same pragmatic meaning, requiring further adaptation as well. In Global South contexts, where several local languages exist, research teams require multilingual skills in order to make regular adjustments to the strategy to make best use of opportunities and build long-term relations with the communities (Cheema et al., 2018).

Another challenge, which emerged during discussions in the workshop, was that of knowledge construction relating to cultural differences in defining 'truth'. Differences in the education systems between Global North-South countries coupled with cultural factors result in different perceptions about abstract thinking. In design research, especially in participatory workshops, abstract thinking is often a useful tool employed in looking at the bigger picture and making sense of different types of information. Our experiences and that of our workshop participants affirmed that many of research participants in Global South contexts lack the experience and confidence to engage in creative lateral thinking, and even to think critically about matters unfamiliar to them. Even in situations with small number of workshop participants, there was still a level of unease when it came to thinking differently, which created conditions of cautious interactions.

This challenge extends beyond workshops to other design research methods, such as questionnaires, as most enumerators find it difficult to fully understand and contextualise open-ended questions (Cheema et al., 2018). This coupled with language barriers and cultural hegemony results in lack of salience of concepts, the non-equivalence of concepts, and the use of levels of language not easily comprehensible to people with limited education (Casale et al., 2011).

The latter also has implications for multi-disciplinary and inter-disciplinary research. The literature suggests that creating multi-disciplinary North-South partnerships and promoting inter-disciplinary dialogue remains a struggle (Bradley, 2007). The lessons learnt from our Dust Bunny project also suggest that a disciplinary resistance may have been at play. As an action-orientated discipline design acknowledges gaps in data and addresses them to move forward, where some disciplines are constrained by data leading to perceived inaction from a

design perspective. The challenge for non-design researchers working within a design-led project is in accepting an action-orientated approach, while not diminishing the methodological foundations of their own disciplines. The challenge for design researchers is to recognise these disciplinary clashes, acknowledge the differences in the disciplinary approach, and to guide the project toward action.

The disciplinary and educational background differences discussed above affect the robustness of the research methods, in relation to how they are perceived and employed in the Global North context. During the workshop challenges of qualitative research literacy in relation to data collection and data analysis were reported. Similar challenges are also found in the literature, where poor research production, in terms of both quantity and quality and a critical lack of support for research development activities (including infrastructure and incentives) affect research (Atkins et al., 2016).

Moreover, the variability of research skills (due to diverse research literacy) amongst research assistants and enumerators hired in Global South projects further undermine research method robustness (Durand-Morat et al., 2015) For instance, in the Dust Bunny project, we observed an inconsistency in the data descriptions (length and quality) received from our group of research assistants in the ethnographic study. This matches other reports from the literature, where the quality of focus group facilitation was also inconsistent, which in some cases lead to them having to hire additional staff (Casale et al., 2011).

Challenges have also been reported with regards to the implementation of research methods in the field. In particular, privacy is often a problem in research methods implemented in a low-income setting or informal settlements (Nel et al., 2017). Due to a lack of space and seating, individual data collection often becomes challenging. Privacy and confidentiality are hard to guarantee and oversee as participants' responses are shared beyond the research team, with whomever happens to be within earshot from the space (communal household or informal settlement) and due to frequent interference of family/community members (Rubinstein-Ávila, 2009; Regmi et al., 2017). As keeping non-participants away can be culturally and physically difficult to accomplish (Regmi et al., 2017), this has implications for the data collection process (as some personal insights may be chosen not to be shared) and/or for the research method itself, as in effect an interview method may have to be changed to a focus group in reaction to the environment/context.

4.3 Partnership
One of the main challenges researchers with experience in the Global North face, when working with researchers in the Global South, is to assume that the same conditions will prevail when expanding their activities into developing countries (Durand-Morat et al., 2015).

The conditions are in fact very different. A lot of it relates to power dynamics in the North–South collaboration and partnership.

The literature suggests that asymmetry between partners remains the principal obstacle to productive research collaboration. The '90/10' gap, refers to the phenomenon where 90% of the health research is done in countries with 10% of the world's health problems and in a mismatch between the disease burden and the technical and human capacity for research in developing countries (Edejer, 1999; Atkins et al., 2016). This also applies to design research. In the context of North–South global research partnerships, asymmetries in power have been linked to perceptions of unequal knowledge, competence, and resources that confer advantages to Global North partners (Berndtson et al., 2007; Olivier et al., 2016). These include inequitable access to information, training, funding, conferences, publications leading to disproportionate influence of Northern partners in project administration and budget management (Bradley, 2007). This usually results in the research agenda being dominated by the Global North partner researchers and agencies, with funding directed primarily towards international salaries, rather than the salaries of local researchers (Godoy-Ruiz et al., 2016).

Discussion during the workshop also revealed that structural inequalities clearly impact the process of selecting partners and setting the research agenda. Colonialist mentalities in research partnerships formed another concern, with delegates sharing examples of situations where Global South partners felt the need to seek permission to change design research methods. Critiques of the neo-colonialist nature of research relationships between high- and low-income countries have been documented in the literature (Godoy-Ruiz et al., 2016).

Face-to-face time with research partners forms a key enabler to develop further the collaboration and the research, however limited funding for international travel often prevents this. In the absence or limited opportunities for face-to-face communication (often dictated by the need to reduce travel, due to the climate change as well as to hostile environments and natural disasters in some Global South countries), online/telephone communication becomes paramount. However, collaborations in global research are strained by distance and communication barriers (Godoy-Ruiz et al., 2016). In the case of the Dust Bunny project limited Internet access and poor Global South telephone-conference facilities severely impacted regular and more direct communication.

4.4 Impact and Legacy

The impact and legacy of projects running in the Global South were themes, which were highly discussed during the workshop, especially in light of the different expectations held among stakeholders. How these different expectations are dealt with once the study is finished (Edejer, 1999) poses a challenge that is often unaddressed.

Questions were raised as to how North partners communicate and disseminate findings to stakeholders and beneficiaries in the South as well as how to best measure impact. It was observed that recording data from the start of the project to demonstrate impact was important, as was the recording of stories.

Creating a legacy after the project ends is a challenge for any research project, but it is one that poses a greater challenge for Global North researchers working in the Global South. On one hand, many Global South research institutions still lack capacity to self-sufficiently undertake research to translate findings into impact and policy (Frazen et al., 2017). On the other hand, there have been far too many research projects that use practices of 'mosquito' or 'parachuting' researchers into a Global South countries. These projects perform research work, and fly the data out—with the results being learnt only on publication (Edejer, 1999). In fact, dissemination being oriented towards international journals and conferences rather than local knowledge translation (Godoy-Ruiz et al., 2016), does not only diminish local communities trust towards Global North-led/funded projects, but impedes local dissemination and impact. Regarding the latter, our academic delivery of results is often unusable to research participants. A larger and more difficult challenge is to involve the communities themselves in the research questions and to link the research to their own development (Bhutta, 2002). Design research methods such as storytelling and co-design workshops were recognized by workshop participants as the best medium for sharing knowledge with communities, since they have a great capacity for involving them in the insights gained from the research.

Relevance and relatability of findings with communities is further hindered by cultural factors. Our experience from the Dust Bunny project along with the literature suggest that disseminating findings is not simply an academic or linguistic translation exercise, but also must be adapted to the cultural, social and linguistic norms of each particular context (Rubinstein-Ávila, 2009).

5. Conclusion

In this paper, we have combined experiences from the IASDR workshop we ran in September 2019, our own experiences from running a Global Challenge Research Fund project in Ghana (Dust Bunny project), and the literature to explore and discuss the challenges and opportunities associated with applying design research methods in the Global South. These included challenges in conducting design fieldwork, engaging research participants, and employing design research methods, as well as developing North-South partnerships, and considering the impact and legacy of research.

Challenges and Opportunities in Conducting and Applying Design Research beyond Global North to the Global South

Regarding building research partnerships, it has become clear that unless the model of North-South collaboration changes, the unintended ill consequences on local research will continue to subvert efforts to apply research effectively, build capacity (Edejer, 1999), which result in genuine impact on the lives of local communities.

Many of the design research methods used in the Global North were developed, and honed in, and for, the Global North. Given the cultural difference between different countries in the Global South and the Global North the design methods common to developed countries are not necessarily appropriate for use in developing countries without significant adaptation.

Global North researchers need sufficient time in-situ with Global South researchers in the pre-design phase of a research study to establish collaborative working practices and in doing so to consider how methods work in, and are adaptable to, Global South contexts. This phase of work needs to be acknowledged as being necessary, at both the funding and the implementation stage, until unique design methods of, and for, the Global South are significantly more commonplace and design research is better established across the Global South.

5. References

Amerson, R. M., & Strang, C. W. (2015). Addressing the challenges of conducting research in developing countries. Journal of Nursing Scholarship, 47(6), 584-591.

Atkins, S., Marsden, S., Diwan, V., Zwarenstein, M., & ARCADE consortium. (2016). North–south collaboration and capacity development in global health research in low-and middle-income countries–the ARCADE projects. *Global health action*, *9*(1), 30524.

Berndtson, K., Daid, T., Tracy, C. S., Bhan, A., Cohen, E. R., Upshur, R. E., ... & Singer, P. A. (2007). Grand Challenges in Global Health: Ethical, social, and cultural issues based on key informant perspectives. *PLoS medicine*, *4*(9), e268.

Bhutta, Z. A. (2002). Ethics in international health research: a perspective from the developing world. *Bulletin of the World Health Organization*, *80*, 114-120.

Blessing, L. T., & Chakrabarti, A. (2009). DRM: A Design Research Methodology (pp. 13-42). Springer London.

Bloomfield, S. F., Exner, M., Fara, G. M., Nath, K. J., Scott, E. A., & Van der Voorden, C. (2009). The global burden of hygiene-related diseases in relation to the home and community. In International Scientific Forum on Home Hygiene (Vol. 24)

Bradley, M. (2007). North-South research partnerships: challenges, responses and trends; a literature review and annotated bibliography. Canadian partnerships working paper.. https://idl-bnc-idrc.dspacedirect.org/handle/10625/36539

Casale, M. A., Flicker, S., & Nixon, S. A. (2011). Fieldwork challenges: Lessons learned from a North–south public health research partnership. *Health promotion practice*, *12*(5), 734-743.

Cheema, A. R., Mehmood, A., & Khan, F. A. (2018). Challenges of research in rural poverty: lessons from large field surveys. Development in Practice, 28(5), 714-719.

Curtis, V., Biran, A., Deverell, K., Hughes, C., Bellamy, K., & Drasar, B. (2003). Hygiene in the home: relating bugs and behaviour. Social science & medicine, 57(4), 657-672

Curtis, V., Schmidt, W., Luby, S., Florez, R., Touré, O., & Biran, A. (2011). Hygiene: new hopes, new horizons. The Lancet infectious diseases, 11(4), 312-321

Durand-Morat, A., Wailes, E. J., & Nayga Jr, R. M. (2015). Challenges of conducting contingent valuation studies in developing countries. *American Journal of Agricultural Economics*, *98*(2), 597-609.

Edejer, T. T. (1999). North-South research partnerships: the ethics of carrying out research in developing countries. *Bmj*, *319*(7207), 438-441.

Franzen, S. R., Chandler, C., Siribaddana, S., Atashili, J., Angus, B., & Lang, T. (2017). Strategies for developing sustainable health research capacity in low and middle-income countries: a prospective, qualitative study investigating the barriers and enablers to locally led clinical trial conduct in Ethiopia, Cameroon and Sri Lanka. *BMJ open*, *7*(10), e017246.

Godoy-Ruiz, P., Cole, D. C., Lenters, L., & McKenzie, K. (2016). Developing collaborative approaches to international research: Perspectives of new global health researchers. *Global public health*, *11*(3), 253-275.

Hák, T., Janoušková, S., & Moldan, B. (2016). Sustainable Development Goals: A need for relevant indicators. Ecological Indicators, 60, 565-573.

Lages, C. R., Pfajfar, G., & Shoham, A. (2015). Challenges in conducting and publishing research on the Middle East and Africa in leading journals. International marketing review, 32(1), 52-77.

Mathee, A., Harpham, T., Naicker, N., Barnes, B., Plagerson, S., Feit, M., ... & Naidoo, S. (2010). Overcoming fieldwork challenges in urban health research in developing countries: a research note. *International Journal of Social Research Methodology*, *13*(2), 171-178.

Nel, E., Rich, E., Morojele, N., Harker Burnhams, N., Petersen Williams, P., & Parry, C. (2017). Data collection challenges experienced while conducting the international alcohol control study (IAC) in Tshwane, South Africa. *Drugs: Education, Prevention and Policy*, *24*(5), 376-383.

Olivier, C., Hunt, M. R., & Ridde, V. (2016). NGO–researcher partnerships in global health research: benefits, challenges, and approaches that promote success. *Development in Practice*, *26*(4), 444-455.

Regmi, P. R., Aryal, N., Kurmi, O., Pant, P. R., Van Teijlingen, E., & Wasti, S. P. (2017). Informed consent in health research: challenges and barriers in low-and middle-income countries with specific reference to Nepal. Developing world bioethics, 17(2), 84-89.

Roberts, K., Gordon, S., Sherr, L., Stewart, J., Skeen, S., Macedo, A., & Tomlinson, M. (2019). 'When you are a data collector you must expect anything'. Barriers, boundaries and breakthroughs: insights from the South African data-collection experience. *Global health promotion*, 1757975918811093.

Rubinstein-Ávila, E. (2009). Reflecting on the Challenges of Conducting Research across National and Linguistic Borders: Lessons from the Field. *Journal of Language and Literacy Education*, *5*(1), 1-8.

Stanwell-Smith, R., & Bloomfield, S. (2004). The hygiene hypothesis and implications for home hygiene.In Italy International Scientific Forum on Home Hygiene (IFH) Next Health Srl, P. le Türr Milano (pp.0149).

Salvador, T., Bell, G., & Anderson, K. (1999). Design ethnography. *Design Management Journal (Former Series)*, *10*(4), 35-41.

Sanders, Elizabeth B.-N. and Stappers, Pieter Jan (2014), Probes, Toolkits and Prototypes: Three Approaches to Making in Codesigning. CoDesign : International Journal of CoCreation in Design and the Arts, 10(1): 5–14.

Teye, J. K. (2012). Benefits, challenges, and dynamism of positionalities associated with mixed methods research in developing countries: Evidence from Ghana. *Journal of Mixed Methods Research*, *6*(4), 379-391.

Tsekleves, E., Yong, M. H., Lee, C. A. L., Giga, S. I., Hwang, J. S., & Lau, S. L. (2019). Rethinking how healthcare is conceptualised and delivered through speculative design in the UK and Malaysia: A Comparative Study. *The Design Journal*, *22*(Suppl. 1), 429-444

Osborn, D., Cutter, A., & Ullah, F. (2015). Universal sustainable development goals. Understanding the Transformational Challenge for Developed Countries. https://sustainabledevelopment.un.org/content/documents/1684SF_-_SDG_Universality_Report_-_May_2015.pdf

United Nations, 2016. The Sustainable Development Agenda - United Nations Sustainable Development [WWW Document]. United Nations Sustainable Development. URL https://www.un.org/sustainabledevelopment/health/

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