Contemporary Participatory Design: Research Agendas for Societal Crisis

Rachel Charlotte Smith
Digital Design and Information Studies
Aarhus University
Aarhus, Denmark
rsmith@cc.au.dk

Liesbeth Huybrechts
Civic and Policy Design, Digital Futures Lab
UHasselt
Diepenbeek, Belgium
liesbeth.huybrechts@uhasselt.be

Jesper Simonsen
People and Technology
Roskilde Universtity
Roskilde, Denmark
simonsen@ruc.dk

Daria Loi
Studio Loi LLC
Portland, Oregon, USA
surrealist.milliner@gmail.com

Abstract

This article addresses urgent calls for action and advocates for equitable, responsible and participatory research and practices that, while engaging with contemporary societal landscapes, and global polycrises, directly contribute to the collaborative shaping of alternative futures and real-world impact. Over the past decade, Participatory Design (PD) research, theory, and practice – along with its core values of participation, empowerment, and democracy – have diversified and evolved in novel directions. Drawing on surveys of contemporary engagements with global and societal challenges, this article discusses how PD engages with three interrelated crises: technological, onto-epistemological, and socio-ecological. Based on this work, we foreground four emerging research agendas in contemporary PD – *politicising, diversifying, relationality,* and *transforming*, and show how they extend PD's theory, method and practice towards societal impact and change. Drawing together such research agendas across diverse disciplines, continents and practices, we demonstrate how contemporary PD can be leveraged to address today's acute crises.

CCS Concepts

• **Human-centered computing**;

Keywords

Contemporary Participatory Design, Crisis, Research Agendas, Societal impact

1 Introduction

Over the past decade, the world has experienced an unprecedented wave of intertwined crises that exponentially threaten global communities and challenge our ability to create a secure and sustainable future for all. The sixth decennial Aarhus conference invites contributions that examine the various roles of computing in shaping, understanding, improving, causing, and responding to the human condition in a world subsumed with multiple crises. With roots in the field of Participatory Design (PD), the conference is an ideal forum for critical reflections on how PD research, theory, practice, and core values have evolved over the past decade in response to the many crises we face today. In this article, we present recent research from the PD community and explore future research agendas and perspectives that the field offers in addressing local and global computational challenges.

Participatory design actively engages people, groups, and other actors in collaborative design processes to explore and co-create everyday technologies, environments, organizations, and institutions that are more responsive to human and planetary needs. As a research field, PD has a longstanding commitment to the core values of emancipation, empowerment, and democracy, fostering a global community of researchers and practitioners dedicated to addressing societal challenges. Prioritizing social justice and agency, PD seeks to include diverse individuals and groups in the collective shaping of alternative futures [169].

Despite its ongoing evolution and continuous political and sociotechnical engagements, contemporary PD faces numerous challenges and ambiguities in addressing today's multifaceted and complex conditions. First, *technology* is increasingly dominated by a few very large companies and providers, leading to greater integration, standardization, and complexity in design, configuration, and engagement. Second, *participation* has become more challenging – not only due to the diversified, dispersed, and versatile nature of groups and collectives but also because it no longer follows timelines and processes confined to single projects. Instead, participation unfolds in multiple forms over time, involving different actors, relationships, and interconnected processes. Third, the *contexts* within and surrounding PD are becoming more diverse and interwoven, making them harder to define, situate, and grasp – culturally, geographically, and conceptually. Fourth, *knowledge* and

knowledge production has become more pluriversal, incorporating diverse epistemologies, ontologies, and multiple ways of knowing. Finally, PD practitioners and researchers increasingly question their roles and responsibilities in addressing fundamental and future concerns related to people, societies, species, and the planet [101]. Indeed, as key contributions to PD over the past decade highlight [14, 31, 42], contemporary PD's evolution is characterized by ambitions, tensions, and critical concerns regarding how to practice within – and respond effectively to – changing global conditions.

In this article, we focus on three major societal crises – socio-ecological, technological, and onto-epistemological – as they are deeply intertwined with PD's critical role, responsibilities and potential impact. We build on [80], who defines crisis by three interrelated conditions.

The first condition is the violent instability of Planet Earth (such as dramatic cooling and warming), making it impossible to still make modern divisions between Nature and Culture, natural and human histories. This is what we call in the paper the intertwined socio-ecological crisis. We relate the *socio-ecological* crisis to a number of intertwined issues, from sustainability and climate change to political-economical challenges of designing beyond ideas of growth [21], and navigating the global humanitarian crisis due to conflict, persecution, and human rights violations. This crisis explores not only the challenges of extending PD across urban, suburban, and rural contexts, but also the complex entanglements between human and more-than-human worlds.

The second condition entails the challenging of the distinction between the natural and artificial, life and technology, introducing the age of the naturalised artificial, which we refer to in this paper as the technological crisis. The *technological* crisis encompasses the impact and challenges of emerging technologies, social media, computational systems and literacies, and the widespread adoption of AI systems across diverse contexts, including the workplace, as these technologies disrupt established practices and local empowerment. This crisis raises concerns, fear, and challenges in relation to the impact of computational technologies on everyday life, work, and overall well-being.

Finally, the third condition – characterized by a lack of a functional world order due to the diminishing collaboration among global power blocs – has brought us to define what we call an *onto-epistemological* crisis. With this third crisis, we highlight gaps in power, knowledge, and epistemologies that are experienced through different political movements against oppression and dominance, especially in relation to the disparities between Global North(s) and Global South(s). The diversification of the field has urged numerous researchers to address the politics and decoloniality of research, theory and practice, towards diverse onto-epistemologies of situated lifeworlds and underrepresented communities.

Design has contributed to these crises in which planetary, technological, and political economic tendencies are intertwined [80]. Design has privileged Anglo-Eurocentric ways of framing rational technocratic humans who can solve problems, over other ways of thinking, feeling, and living. While design can never solve these problems alone, situated and local design responses can contribute and play a vital role to their transformation. In this article we survey and provide examples of how these societal transformations are addressed in contemporary PD and subsequently propose four agendas for future research. While the three crises, deeply intertwined with numerous social, political, environmental and economical challenges, are corroding and destabilizing societies and communities at global and local levels, they are also pushing the PD community to rethink its theories, methods, and approaches.

PD practitioners and researchers increasingly face existential and methodological questions about how to navigate these complex conditions, which in many ways differ radically from the contexts in which PD emerged and the participants they had to involve (e.g. [42]). While in the 1970s, PD started with a focus on empowering workers in response to the rise of workplace automation [147], contemporary PD is facing large-scale monopolistic technology providers, intricate relationships between institutions and everyday life, and entanglements between human and more-than-human worlds in tackling societal and climate issues. PD's scope has expanded to include diverse pluralistic perspectives to address a wide range of contexts in a complex world. From our survey of the past decade of PD research and practice, we propose the following four research agendas, all of which are deeply rooted in the legacy of PD while showing new trajectories and potentials for tackling societal transformations:

- *Politicising* agendas of power, agency and participation in design and technology;
- *Diversifying* to embrace a multiplicity of contexts, actors, knowledges and lifeworlds;
- *Relationality* for strengthening and expanding interconnections of researchers, participants, actors and collectives;
- *Transforming* through grounding participatory practices for sustainable futures at scale.

In the following section, we briefly outline the methodological approach of this article. We then present the three aforementioned crises across diverse fields, regions, and environments. Supported by Fallman [73]'s triangle of interaction design research, we present the four agendas for PD as pathways for transforming within complex global challenges and navigating radically shifting contexts towards societal impact and change. As demonstrated through concrete research projects, these agendas are deeply rooted in PD's strong legacy and extend participatory designers' focus toward transformational impact at diverse timelines and scale(s).

2 METHODOLOGY

This article builds on the work that informed the newly published *Routledge International Handbook of Contemporary Participatory Design* [169], which brought together 42 authors and 6 senior advisors to survey state-of-the-art PD literature from the past decade. The authors of this article formed the editorial group and initiated the book project in the spring of 2022. The book project was built directly on the first *Routledge International Handbook of Participatory Design* [166] and focused on identifying contemporary PD and its role in addressing societal and technological transformation at various scales, while considering PD's historical evolution. First, we conducted a preliminary review of PD literature to identify key themes that have emerged in PD research in the past decade, i.e. since 2012. Second, we presented these key themes and invited dedicated groups of co-authors, with an editor participating in each

group. Third, we coordinated a year-long collaborative literature review, utilizing a shared reference management system (Zotero.org), and held three online workshops to discuss the progress of the literature reviews. The starting point for each of the reviews was a survey of all PD conference proceedings, journal special issues, and books published since 2012 (for a complete list, see [169, pp.16ff][1]). This process also involved defining core editorial concepts, conducting group explorations to deepen identified topics, and engaging the broader PD community, through the "Participatory Agenda Game" [101]. Here, the proposed agendas were collaboratively discussed and unfolded in relation to concrete examples of participants' own research and design practices. Feedback and critical reflections from these sessions (PDC'2024 Sibu, 30 participants;, ReWorlding Kick-Off, 30 participants; Day of Science UHasselt, 30 participants; Participatory Design Workshop, 40 participants) have been analysed and integrated into each agenda in the article.

It is important to note that this collaborative process was not without its challenges and limitations. These included issues related to author representation – particularly concerning age and cultural diversity – given the dominance of European and North American publishing records. Additional challenges involved reconciling and fairly representing different understandings of PD, including concepts such as community, democracy, and inclusivity, and fostering nuanced understandings of diverse histories and future agendas.

In this article, we have identified cross-cutting challenges and set agendas for future research and practice based on this work [169]. Additionally, we have reviewed and elaborated on the mentioned three crises, relating them to contemporary PD research and the most recent PD literature and publications (from 2024 and 2025, inclusive of PDC2024). Finally, we critically formulated and proposed PD agendas and perspectives aimed at influencing and responding to the discussed crises in future research.

3 SOCIO-ECOLOGICAL CRISIS

Since the 2000s we have witnessed an increased focus on the role of PD in relation to worsening socio-environmental crises (e.g. climate refugees, and wars) that emerged together with a progressive popularity of PD in governmental institutional agendas. In parallel, PD scholars developed an interest in diverse onto-epistemologies; ecological and critical posthumanism in explorations of decentering design [22, 143] and recognising more-than-human stakeholders and ecologies, also extending inclusivity for a diversity of actors, such as water, trees or energy [4, 7, 18, 30, 52, 91]. In what follows, we discuss how socio-ecological crises has slowly expanded our understanding in PD, from communities to collectives of human and more-than-human actors, how these movements have expanded our vocabulary towards infrastructuring, commoning and institutioning and shifted our understanding of politics in PD.

3.1 From communities to collectives

By engaging with societal themes and public spheres as well as governmental institutions and civil society, PD researchers adopted the term *Community-based Participatory Design* [61]. This community-based PD builds on a long history of valuable PD work with diverse societal issues, with communities, such as in the care (as explored

e.g. in [120], on cross-cultural design with people with dementia) or the public sector [35]. To avoid being neutral facilitators in such contexts and consciously address power relations, they build on connections to discourses in agonism [27, 61]. These engagements have enhanced the discussions on the past decade in designing within the politics of a broad range of civic and social relations and the articulation of concepts such as *publics* [136]. With an emphasis on their complex spatial, social, and political facets, this research was driven within urban communities [61], (sub)urban and rural contexts [55]. The need for working with more complex societal issues has triggered the rise of *Living Labs*, as forms of long-term engagements with real-life contexts such as the Living Labs in Malmö, Sweden [95] and Genk, Belgium [101].

More recently, the ecological agenda has been explicitly added to this community-based agenda. As Heitlinger et al. [90, pp.7] discuss, PD's engagement with the ecological crisis tackles the disconnect between humans and nature. They explain that approaching this disconnect, requires expanding PD's traditional grounding in democracy, rights, fairness, inclusion and empowerment to include an enhanced commitment to the "more-than-human" -technological, ecological, material. The authors trace two lineages of PD scholarship that deal with this ecological crisis. One has grown from Modernist and rights-based thinking and inherits most from PD that has addressed realities within formal organisational structures (e.g. factories, press rooms, etc). The other lineage has developed from theories of *Entanglement*, rooted in discourses on care-based and co-ontological being, as explored in relation to HCI [77], and has grown with the enhanced complexities of socio-environmental crises [7].

With the need to tackle ecological crises, PD has evolved from an idea of community-based design that centers a human concept of "community" to "collective design". Collective design is shaped through "designing with" [186, 187] participants made of diverse and interrelated actors, human and more-than-human: from inhabitants to public and private organisations, technological artefacts, algorithms, or trees. In the case studies described by Heitlinger et al. [90], the '*more-than-human* comes to the surface in multiple ways. Lindström and Ståhl's case on HYBRID MATTERS, for example, explored "plastiglomarate" walks, to engage with human relations with plastics and discover new hybrids of plastics and the natural environment at the coasts of Denmark and Sweden. In the examples of the two Living Labs cases mentioned above, a central concern has been to support a shift towards a focus on more diverse human and more-than-human actors. Malmö Living Labs pays attention to other ways of being and working to make room for cultural diversity in decision making in Malmö city. In Living Lab De Andere Markt, more biodiverse (sub)urban contexts are explored, through researching caring relations with water and energy. In the latter this was explored through nurturing designers' capabilities to reveal human and more-than-human worlds, explore connections between these worlds, reimagine their cohabitation and "institution" (by connecting them to public governments' policy agendas) some valuable practices, such as depaving public spaces to make room for water.

---

[1]See also www.pdcproceedings.org

3.2 Designing with collectives: infrastructuring, commoning and institutioning

The collective and entangled ways of working have enhanced the need for PD to strengthen capabilities to engage with the diverse experiences and views of multiple actors on matters they care for in urban, suburban and rural contexts. This has formed the basis for developing a more nuanced vocabulary for *designing with and for collectives*. In the past years three concepts have become more articulated. First, there has been ongoing research in the PD concept of *Infrastructuring* [112]. Here, PD is focused on debating and critically intervening in infrastructures for urban collaboration (the map, the prototype, the service, the digital platform etc.) [61, 96]. Second, because of ongoing societal and ecological crises, this research on infrastructuring has been complemented with research on the concept of *Commoning* [135, 179]. PD then more explicitly engages with the challenges of unsustainable modes of production and consumption and how to support shaping of commons as more sustainable ways of dealing with shared resources, against defuturing. More recently, the concept of *Institutioning* has supplemented the above two concepts [98, 179]. It has emerged from findings that PD research that reflects on and develops the common management of resources, requires the establishment of relations with institutions who govern these resources, and thus entails challenging and designing relations with existing institutions or the development of new institutions.

3.3 Towards a politics of collectives

Socio-ecological crises have articulated the need for an enhanced sensitivity for the *politics of 'collectives'*: reflections on how joint and distributed collective activities can mediate shared understandings and solidarity in tackling today's crises. As the participating actors in PD processes become more diverse and are entangled in multiple ways, the field needs more understanding of the organisational dynamics of collectives who are shaped and reshaped in changing networks, co-operations, more or less temporary organisational synergies. This awareness has further developed reflections on the role of a collectively articulated identity; an awareness of history and orientation towards future development or degradation; the conscious involvement of more-than-human actors (both technological and ecological) and implicated (silent or silenced) actors [51, 117] and shifts towards regenerative futures. This understanding can critically nurture, strengthen and oppose participatory dynamics and challenge traditional roles of facilitation in PD, supporting the move beyond instrumental (e.g. "a Living Lab on energy transitions should 'fix' the energy problem") or romantic perceptions (e.g. "a Living Lab on the future of energy will organically lead to more sustainable energy solutions") of participatory approaches. This enables openly confronting risks of co-optation and reproduction of power [56].

In addressing today's socio-environmental crises, there is thus room for further research into how collectives work, their diverse ways of being and their participatory practices, as well as how they work together and against each other through interdependencies and politics, when pursuing (sub)urban/rural transformations in-between everyday life and institutions.

4 TECHNOLOGICAL CRISIS

The last decade has witnessed an immense development of digital technologies, most recently in the field of artificial intelligence (AI), including data-intensive algorithmic systems such as machine learning (ML) and large language models (LLMs). Digital technologies are increasingly dominated by global companies and providers, often referred to as "Big Tech". The broad computing domain sees leading companies like Apple, Microsoft, Alphabet (Google), NVIDIA, and Amazon; in social media, Meta (Facebook, Instagram, WhatsApp), ByteDance (TikTok), and X (formerly known as Twitter) dominate the market; and within enterprise and workplace contexts, companies such SAP, Oracle, Cerner, and Epic, as well as Microsoft, Alphabet (Google), and IBM play significant roles. Today and increasingly, digital technologies are large-scale, hyper-connected, pervasive, automated, and functioning as ubiquitous infrastructures, with far-reaching changes that impact individuals, organizations, communities, and global societies.

PD has engaged with digital technologies since their introduction to the labor market in the 1970s [147] and has a long tradition of discussing the pros and cons of new technologies – from the debate over automation versus tool-support approaches [65], which parallels contemporary discussions on AI, to the discourse on technology's impact on democracy [26], echoing concerns about social media platforms and their pervasiveness into all aspects of everyday life. PD thus has a strong track record in fostering emancipatory participation and empowerment, democracy, and socio-ecological sustainability [114]; alongside an ethical commitment to representation and politics-in-action [154].

Given today's radical technological developments and socio-technical realities, critical PD approaches – and the emancipatory principles and perspectives from this tradition – are highly relevant. In the following, we explore this relevance from the perspective of two user groups: adult citizens utilizing workplace technologies and children and youth engaging with emerging computational technologies and social media.

4.1 Towards local configurations and empowerment of workplace technologies

Contemporary work environments are typically filled with information systems – newly introduced or part of the existing installed base Aanestad et al. [1] – that form a complex infrastructure, with top-down initiated and embedded workflow standards added at an almost exponential rate. These systems often disrupt established work practices and fail to meet users' needs because, after the initial top-down implementation, the process does not transition into the necessary bottom-up approach – one that is collaborative, iterative, and mutually configured [94, 164].

Organizational large-scale systems, including those commonly known as Enterprise Resource Planning systems (ERP) or, within healthcare, Electronic Health Record systems (EHR), are in fact highly configurable. However, there is a notable lack of effective methods to enhance system use after initial implementation [134], as highlighted in Information Systems [97, 148] as well as healthcare EHR systems literature; [15, 20, 86, 93]. Recent studies confirm a similar crisis and persistent challenges when implementing AI/ML in organizational settings (e.g. [88, 120, 178, 195]).

The need for users to engage in local configuration and manage the existing system portfolio in satisfying ways is evident and increasing, but also facing a lack of knowledge, acknowledgement, inclusion, competencies, resources and appropriate participatory approaches. PD has a long tradition of developing and refining methods and techniques to address emerging and evolving application areas, despite complexities and challenges [85]. PD work over the past decade has increasingly expanded its scope, from focusing solely on pre-implementation activities – such as initial analysis, vision development, and prototype creation – to including post-implementation areas [162]. This shift from short-term, research-driven projects to sustained collaboration and commitment within long-term, large-scale public or commercial initiatives, is reflected in the PD literature (see e.g. [32, 69, 112, 151]).

While data's importance as a strategic resource drives organizations to deploy AI [88], the introduction of AI in organizational settings amplifies the technology crisis [36]. In the healthcare sector, for instance, AI can significantly impact clinician-entered, primary-use EHR data [85], because the primary clinician use, focused on direct patient care and treatment (see e.g. [15]), often conflicts with the secondary use, where AI is leveraged to extract statistical insights or other administrative or economic benefits.

PD plays a critical role in amplifying the voices of end-users, ensuring inclusive, equitable, robust, responsible, and trustworthy implementations and use of AI [23, 104, 128]. However, this expanded role of PD has not yet been fully addressed and is not without challenges [78], because the implementation of AI involves navigating complex issues across multiple organizational and political arenas and scales, including misaligned stakeholder expectations, concerns about data quality, and ethical dilemmas. Gyldenkærne et al. [86] provide an empirical account for these challenges and present practical and transferable strategies to address them, offering a roadmap for future PD supported AI/ML implementations. Choi et al. [48] introduce the notion of "situated automation" when exploring how AI systems may be considered as actors in PD. Gautam [83, p. 32] describes how PD can critically inform AI implementation efforts by "exploration of non-AI alternatives and making the essential human labor underpinning AI systems visible".

While the introduction of AI is often driven by anticipated benefits from automation, PD can play a pivotal role in framing AI as a valuable tool for supporting skilled work, as such "knowledge strategy" initiatives are deeply rooted in the heritage of PD [114]. Wolf and Blomberg [193], for instance, discuss IT architects' participation in implementing ML systems to support their work and how the process "actively shaped the project's trajectories, offering feedback on various system prototypes as well as the alignment between the project's various aims and their everyday work practices" [193, p. 193]. Hertzum and Simonsen [94] identify and describe the local competencies necessary to manage mutual configurations of the new technologies and affected work practices. Norberg-Schultz Hagen et al. [145], drawing on work at a media house where AI was implemented to automate curation based on quantitative rankings, proposed a PD prototyping approach to facilitate discussions among editors, demonstrating how they "could maintain what they consider important professional skills and competence when working with a more automatic and data-driven tool"

[145, p. 31]. Kariotis and J. Mir [113] critically employ the term *algorithmic governance* to describe the growing reliance on predictive and other algorithms to enhance efficiency and advocate for an approach that integrates participatory technology assessment with constructive technology assessment, emphasizing co-construction and iterative reconfiguration of AI.

An example of a long-term PD project focused on developing a general approach to post-implementation improvements is Effects-Driven Information Technology Improvement (EDIT) [163]. EDIT can be compared with another comprehensive PD method, the MUST method [39]. However, while the MUST method addresses traditional PD pre-implementation activities (e.g. early analysis and design) to create coherent visions for change, EDIT focuses on post-implementation challenges, directly addressing the current technology crisis by engaging users and other local stakeholders in sustained PD iterations – iterations that involve specifying, realizing, and evaluating desired usage effects for implemented and operational systems. The EDIT method embodies a distinctly PD approach characterized as local, lightweight, data-driven, exemplary, and meaningful – the latter emphasizing that the effects driving the iterations are accepted by and make sense to users and other stakeholders.

In summary, PD addresses the workplace technology crisis by focusing on evaluation and iterative, learning-based processes that extend into post-implementation phases, emphasizing participatory practices to situate and ground local contexts and initiatives. Additionally, PD leverages long-term sustainability and infrastructuring as a generative, design-oriented resource [165] and re-emphasizes its foundational commitment to political engagement within workplace settings.

4.2 Computational empowerment and literacies for future generations

Technologies from social media giants (TikTok, Instagram, Snapchat, YouTube, Facebook, WhatsApp, etc.) pose significant challenges to society, especially in relation to vulnerable groups such as children and teens, due to their *addictive* (e.g., [8, 64, 189]) and highly *manipulative* designs (e.g., [54, 124, 137]). Youth across the globe are more digitally connected than ever (e.g. [75]) and there are growing political, societal, and public concerns on the ramifications of such dynamics. Recently Australia enacted a law banning children under the age of 16 from accessing social media platforms [182] and in the United States there are numerous state-wide bans in relation to the use of mobile phones in public schools [57].

PD practitioners and researchers are developing educational programs to equip youth with the critical skills needed to navigate and challenge systemic online manipulations and provide them with the competences and digital literacies for engaging in the future workforce and democracy. For years, PD has addressed issues related to children and youth [105, 162] – ranging from designing learning experiences that emphasize empowerment [87, 103, 115] to research suggesting that children can take on the role of protagonists [107]. Participation not only helps children develop knowledge and new perspectives on technology (see also [131]) but also engages teenagers as research apprentices, empowering them to address online safety issues [47].

PD has inspired research agendas challenging traditional computing education approaches, highlighting for instance how co-design activities can engage youth, while encouraging them to view computing through a critical lens [141]. Recent PD research also advocated for a shift from traditional computational thinking in pre-college technology education to a focus on computational empowerment [59, 108, 133, 158, 159, 170] and generated not only guidelines for learning about AI [181], but co-created opportunities to integrate AI and other forms of computational education into school curricula [122].

An example of a long-term, multi-stakeholders and cross-disciplines PD project aimed at advancing formal educational agendas is the Computational Empowerment for Emerging Technologies in Education (CEED) project at Aarhus University ([78, 170]). The CEED project shifts the focus of STEM education toward computational empowerment, emphasizing how children can be equipped to make critical, informed decisions about the role of digital technologies in their lives by developing the ability to understand, reflect on, and critically engage in the creation and deconstruction of technologies that shape the present and future. Based on extensive collaborative work in primary and secondary education, with students, educators, and municipalities, the outcomes of the project have provided a foundation for future PD research agendas on emerging technology education [138, 170], developing design principles and learning strategies for educators and learning communities [159], and establishing best practices for integrating computational competences, empowerment and critical digital literacies into new national curricula on Technology Comprehension in Danish education. As part of a larger ecology and infrastructuring of research activities over a decade, these have created grounds for a Danish national Research Centre for Technology Comprehension directly targeting political impact and transformation [9].

In summary, PD addresses the computational and emerging technologies crisis by fostering participatory practices that actively engage with the aspirations, challenges, and futures of next generations and youth collectives. It emphasizes calibrating participation in responsible and caring ways while advancing political agendas to (re)balance power dynamics and amplify marginalized voices through design.

5 ONTO-EPISTEMOLOGICAL CRISIS

A central challenge in contemporary societies is the experience of inequality, oppression and power systems, with a chasm between the Global North(s) and the Global South(s). The geopolitical gaps that exist have been increasingly demonstrated – from wars in Ukraine and Gaza, to China's increased influence on the African continent, and the persistent dominance of the West bound to historical colonialism, perpetuated by powers of Big Tech corporations and AI – adding new risks of defuturing [79]. Many people in the global South or historically underrepresented groups still consider Western societies to be self-centered, arrogant, and exhibiting double moral standards [46].

Within PD research and practice, modernist traditions and Westernised knowledge systems have disregarded aspects related to decolonial thinking and concepts from the South(s) for a long time. This has left a majority of PD research unchallenged from a

decolonising perspective, and emerging strands of PD that have evolved across diverse non-Western regions towards decolonial ontological design [180]. These important dynamics inherent in PD are often marginalized in prevalent approaches, methods and tools, e.g., through universal understandings of participation, exclusions of certain dimensions of life, or aspects of experiences [162].

Decolonisation is thus increasingly a matter of concern in global design and technology research and practices with discourses addressing the ongoing societal challenges of political, economic and racial justice, deeply rooted in coloniality and perpetuated within global Eurocentric structures and worldviews [171, 191]. The promotion of Western epistemologies, one-size-fits-all technologies, and the unquestioned transferability of design methods continuously suggest ideas of universality of design. Many calls, however, from PD and HCI urge researchers and practitioners to address the politics, bias, and exclusion of marginalised groups and communities in design and knowledge production [71, 82, 119, 160, 180]. In the past decade, attention to diverse onto-epistemologies and decolonising discourses, theories, concepts and practices towards pluriversality have increasingly been addressed and incorporated into PD (e.g. [53, 56, 110, 156, 172].

5.1 Rethinking onto-epistemological divides through decolonial PD

In attempts to counter systemic biases, design researchers call for diversity, equity and inclusion of the marginalised in collaborative design processes, Winschiers-Theophilus et al. [191] present a framework of PD and decolonial movements into four strands of *anticolonial, postcolonial, decolonial* and *pluriversal*. The authors highlight that discussions over (de)coloniality and design are often limited and conflate issues of post- and decoloniality in research and practice [53, 132]. Contributions use postcolonial theory to point out the underlying values and biases that reinforce power relations and Eurocentric knowledge productions, but without moving beyond critique to closing the gaps between theory and practice. Decolonising authors urge for engagement in local adoptions of technology research and design [23, 71, 72, 171] that align more closely with underrepresented voices and situated lifeworlds. Scholars argue that plurality in design can only be achieved through inclusion of previously excluded perspectives, colonised or socio-economic disenfranchised communities, if we strive for a design which embraces "a world where many worlds fit" [44, 71, 160]. This demands careful *de-linking* of research and technology from colonial traditions, *re-thinking* epistemic paradigms and *re-building* research practices and technological designs [3, 116, 139, 140].

PD researchers and practitioners in diverse global contexts are engaging deeply with ways of creating and sharing knowledge through situated actions, accountabilities, and responsibilities. Inspiration can be drawn from the anticolonial movements in Latin America and early connections to the developments of Scandinavian PD, often erased or fragmented in the literature [191], to the anticolonial movements from indigenous populations against oppressive regimes and their historical influence on the foundations of intellectual critique and social science theory [49, 76, 184]. Here

Freire's anticolonial critical pedagogy (1985) and participatory action research [74] inspired early Scandinavian PD [45, 66, 191], forging new connections between theory and practice in PD projects such as Demos, DUE, and UTOPIA [40].

Historical and epistemological connections have been reconnected through Participatory Design Conferences (PDC). PDC2014 in Namibia brought together PD research communities, practices and communities across Africa and Western communities. PDC2020 in Colombia reconnected the Latin American community with PD with the focus *Designing Otherwise* and including English, Spanish and Portuguese language tracks, while PDC2022, *Embracing Cosmologies*, comprising 12 global PDC Places[2], extended into PDC2024 in Sarawak, to include Asian and Pacific PD researchers and communities. These events supported the diversification of PD, bringing new trajectories towards *onto-epistemologies at different scales* [33], allowing historical reconnections across global North-South, East-West divides; concepts of *designing for autonomy* [156], for reconciliation [152], and participation of indigenous knowledges [81, 150, 153, 192]. Such movements have widened historical and temporal frames toward past and present voices, materials, technologies and ecological entities into situated future making activities [100, 109, 173] and towards *pluriversality* and inclusive onto-epistemological approaches [17, 144, 156, 157, 171].

5.2 Relational approaches for decolonising design

Adapting these modes, concepts, methodologies, and sensibilities into PD practices, a range of novel approaches are linked to engagements with diverse onto-epistemologies and the rebalancing of power. Clarke et al. [53] proposed a *framework for decolonial action*, which includes: *decolonising in design* by recognising frames of reference that often remain prevalent in PD practice; *decolonising by design* where collaboration becomes a catalyst for challenging institutional perspectives that foreground alternative epistemologies and ontologies; and *decolonising through design*, which implies mobilising cracks to effect change, going beyond research to work with autonomous and communal forms of action and sociability. Such approaches are coined with pluriversal research practices [121, 180], connecting core PD values to actionable and interrelational practices [169, 177]. These include relational concepts of *sentipensar* (feeling-thinking) that brings into focus the inseparability of reason and emotion [156], linked to *corazonar*, (reasoning with the heart) [84], the aboriginal concept of *Ilkwatharra* (good feelings) [174, 175], and *design em parceria* (designing in partnership) [11]. Other approaches include spirituality-based PD [25] and exploring modalities such as touch [130] and bodily movement.

Relational approaches are encouraged by different authors [7, 71, 183, 191] for rethinking PD paradigms and values in the light of entanglement of human and more-than-human worlds towards equity and radical interdependence of beings of all kinds [6, 30] suggest reciprocal, respectful and relations approaches to collaboration, which are sensitive to precarious asymmetries and cultural values. Bourgeois et al. [34] focus on humility, uncertainty and plurality to propose five design principles on transdisciplinarity, cooperative design, contextualised learning for being, locally led

initiatives and empowerment of local actors. Kambunga et al. [110] explore post- and decoloniality with Namibian youth, students, decolonial activists and political stakeholders in Namibia, targeting contested everyday experiences of colonialism among the 'Born Free' - youth born after Namibia's independence in 1990 - faced with ongoing political legacies of the colonial past and lacked agency over their futures [110, 149]. This brought into focus marginal voices in contested decolonial debates and forged new understandings and agency through public engagement and discussions about inclusive futures.

5.3 Algorithmic and technological de-colonisation

The onto-epistemological crisis is also closely connected to and prominent in the rapid evolution of advanced intelligent technologies. As Birhane et al. [23, p.1] argue, participatory approaches are crucial to exploring, understanding and "adequately representing the needs, desires and perspectives of historically marginalized communities". While HCI research is pushing for the design of algorithms through principled values of ethical, transparency, trust and fairness [2, 58] and while such guidelines are being globally adopted, they lack translation and engagement with concrete contexts and communities, and are still driven largely by Western values and frameworks of efficiency and hegemonic one-size-fits-all technologies that reproduce old and new forms of power [5, 24, 78]. As Adams [5] rhetorically argues, current AI innovations create new forms of *algorithmic colonisation* that use ethics as a colonial rationality for *algorithmic justice* and enforce racialising practices that prevent the balancing of power structures. Ambitions of advancing ethical and responsible AI [58], question how to deal with the responsibility for the systems we create and use, and how responsibility can be embedded into these systems, through mechanisms of accountability, trust and transparency. UNESCO's recommendation on Ethical AI (2022), integrates such principles with broader perspectives on human rights and dignity in AI, and calls for participatory approaches to citizen engagement, in practices such as cultural preservation of cultural heritage, indigenous languages and knowledges (ibid. p. 32). As Birhane et al. [24] argue however, the need to put ethics and forgotten margins to the fore, needs radical attention. African AI narratives are missing in the global AI ethics and governance discourse, and notions of responsible research and innovation, which includes responsible AI, needs to be reconceptualised to include local community contexts, knowledges and cultural values in the Global South [68, 188]

In sum, PD strives to embrace and connect researchers and practitioners, and this may contribute to a mutual understanding and appreciation of diverse historical, socio-political and epistemological entanglements between global North-South, East-West peoples and lifeworlds. Embracing decolonial and pluriversal thinking requires recognising alternative and situated traditions of PD, developing a wider understanding of how historicity and geopolitics are embedded into current structures of power and knowledge production. Understanding decoloniality and PD requires extended temporal and spatial frames and offers researchers a relational lens to engage with possible pasts-presents-futures in support of sovereignty and self-determination of future making.

---

[2]https://pdc2022.org/places/

6 FOUR AGENDAS FOR CONTEMPORARY PD RESEARCH AND PRACTICE

Building on the review of how contemporary PD is tackling diverse entangled crises and shaping new programmatic research, we articulate four agendas of contemporary research to guide future directions and actions [169]. These agendas, discoverable in established and recent PD work, demonstrate the increasing concerns of contemporary PD theory and practice with relational complexity, politics, and "big issues" as key PD contributions over the past decade have highlighted (e.g. [13, 14, 43] The contemporary moment in the evolution of PD is characterised by uncertainty – about how to formulate ambitions, deal with tensions, and raise critical concerns about how to practise within and respond to changing and acutely challenging global conditions. To navigate such uncertainties and turn them into actionable design processes, we propose *four emergent agendas* that are being shaped *by, with or through* contemporary participatory research and practice [169]. We propose these agendas as *participatory work and practices* – in the form of actionable verbs – *that are* being or *are encouraged* by the PD community across diverse contexts, scales and times. In the following, the agendas are discussed, providing context to how they shape emergent alternatives and futures given current crises.

The four research agenda are:

- *Politicising*. This first agenda prioritises PD's political agenda of (re)balancing power and agency for pluriversal voices through design by emphasizing inclusion and participation of all affected people, including those traditionally excluded by different designed technologies.
- *Diversifying*. The second agenda engages across contexts, regions, and technologies, human and more-than-human domains, adapting practices and methodologies to diverse knowledges and worlds, to enable agency, self-determination and justice or equity for diverse actors.
- *Relationality*. The third agenda acknowledges the interconnectedness and co-existence of researchers, participants, and other actors, calibrating participation in responsible and caring ways.
- *Transforming*. This fourth agenda addresses the shifting societal challenges and aims to impact multiple arenas and scales, building and grounding strong participatory practices to actively address ambitions, challenges and futures of collectives, societies, and the planet.

Grounded in strong PD traditions, the four proposed agendas stretch and extend classic conceptions of design research and practice in HCI and interaction design, which typically have a more narrow focus in scope and activities (towards technologies, artefacts, services, etc.) and from the perspective of their methodological and theoretical contributions to design studies and practice. Global crises are forcing PD researchers and practitioners to leverage the potential of their craft to envision, design and help build complex, long-term and large-scale solutions, ultimately shifting their focus from design activities and explorations to design action, impact and societal change [169]. This demands a closer integration of design theory and practice, centered towards direct engagement with people, collectives, (trans)national institutions, and the planet on an unprecedented scale. These concerns have often been underestimated, but are being widely discussed in the design field [79, 146], broader academic circles (e.g. [12, 63, 194], as well as within the PD community [33, 40, 78, 169] and PD practice within commercial, nonprofit and public sectors [125–127].

To illustrate PD's socio-technical and political involvement with participation, empowerment and equity for people, collectives, and other actors, while illustrating proposed agendas in the broader context of the design research field, we build on Fallman [73]'s *triangle of interaction design research*. The model illustrates relations among the three extremes of; *design practice* – activities that design researchers are involved in that are very close to practicing design outside of academia; *design studies* – building an intellectual tradition within the discipline, and contributing to a body of knowledge, and; *design exploration* – departing from ones own research agenda, asking "What if?" exploring possibilities outside of current paradigms, between the "real", the "true" and the "possible" (see Fig. 1 below).

We extend the model with a mirroring triangle, to include a fourth key extreme, *design impact*, extending design's engagement with societal change and transformation. The term design impact is still heavily under discussion and can be easily misunderstood when referring only towards its outcomes or effects [40]. However, for the purpose of this paper, we link design impact to societal crisis and impact, and use the term by defining design impact as Participatory Design research and practice that are responsible and responsive to society in process, and part of transformations [80] of organisation cultures, outcomes, etc. [63]. We argue that this addition is valuable because it emphasises a fourth key extreme that must be considered alongside Fallman's "real", "true" and "possible": what we call the "actual." We propose this fourth dimension to highlight the 'necessary' and 'acute' societal conditions and acknowledge the increasing complexity of navigating and positioning one's design research and practices across different fluctuating extremes. This articulation and foregrounding of designs' societal impact forces designers to take responsibility and demonstrate accountability in the face of dominant crises, towards creating long-term scalable impacts of design for social change.

In the following sections, we suggest and experiment with various ways for the model to illustrate and inspire discussion and trajectories for research, with a focus on the (inter)relations to the four PD agendas. The model (fig. 1) is used as a theoretical tool for positioning, navigating and depicting design research activities, agendas and trajectories. It can be used to discuss or reflect on research objectives, as well as expected or unintended outcomes and relations across diverse agendas. We propose the model as a prototypic *diagnostic tool* during or for post-project reflections, to assess the process, outcomes, effects, and impact, as we will demonstrate below using concrete examples. It might also be experimented with as a *programmatic tool* Löwgren et al. [129] for scoping, planning and driving research activities based on, or towards, certain objectives, concerns and dimensions in/of the agendas. Ideally, however, they may be used in both or more ways, as supporting *collaborative tools* for comparing and critically exploring PD theory, practice, methodology and knowledges over time, across different contexts and domains, for collectively strengthening PD's relevance in and for a broader society.
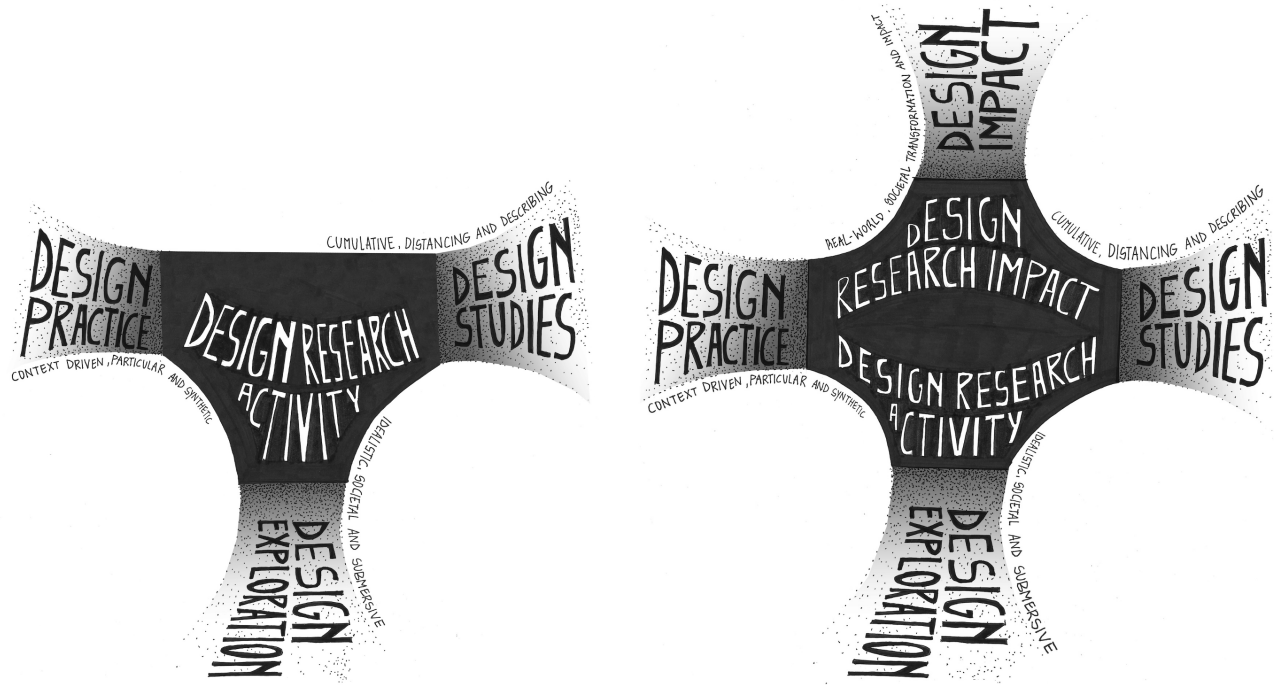
Figure 1: A: Fallman [73]'s interaction design research triangle of design practice, design studies and design exploration. B: Extended model including design impact towards real-world societal transformation and change.

Building on the definition of contemporary PD proposed in our recent work [169], we argue that the model may support the diversification of the field, grounded in solid design traditions, theory and practice, to support defining foundations and trajectories, of design as collective and critical reflective practice [161, 166] through integration with the four agendas:

> "Participatory Design embraces concerns of power inequalities through collaboration with affected actors, as well as those excluded by design processes and technologies. By doing so, Participatory Design foster equity, agency and self-determination in decision-making (*politicising*). Working across contexts, regions as well as human and more-than-human actors, technologies and domains, Participatory Design adapts practices and methodologies to diverse knowledges and lifeworlds (*diversifying*). Participatory Design articulates participation through the interconnectedness and coexistence across the globe, among researchers, participants and other actors, through relational and caring approaches (*relationality*) Participatory Design addresses shifting societal challenges and aims for impact across multiple arenas and scales through strong participatory practices that support the ambitions, needs and sustainable futures of collectives, societies and the planet (*transforming*)." [169, p. 10].

6.1 The agenda of *Politicising*

Politicising articulates the need for PD to *(re-)politicise* its work in relation to diverse actors, and to reconsider as well as re-emphasise the roots of PD's political engagement in workplace contexts, extending such roots to tackle wider societal challenges through activism and impact. Politicising practically means to centre stage strong political agendas of (re)balancing power and agency for marginal voices through design, with an uncompromising focus on inclusion and participation of all affected people, including those that are traditionally excluded by technological developments. We propose that, by engaging in the agenda of Politicising novel practices will emerge from PD's political foundations. Over the past decades, numerous scholars expressed a desire for the PD community to keep a political agenda in the forefront (e.g. [13, 19, 29, 37, 40, 99]) and the discussed crises increasingly indicate that it is imperative for PD to reinforce the politicising, scaling towards temporal and spatial impact [33]. This perspective raises important questions for the PD community to consider and address: How can we design for social justice through PD projects, many of which involve small-scale mutual learning? How can we empower human beings to co-shape their future practices within contested contexts of power, inequality and oppression? And how are power imbalances in an increasingly globalised world shaped and reshaped, especially when more-than-human actors (e.g. water and soil, algorithms and code) and their agency are taken into account?

Figure 2: Example illustrating agendas of *politicising* and *transforming* in the CEED project, working towards technological literacy and computational empowerment.

The crisis imposed technological innovation and automated systems on our personal wellbeing, collective agency, and our planetary conditions present unfathomable challenges when scoping PD projects. To expand the discussion on the *politicising* agenda, we use as exemplar, the CEED project exploring the accelerating impact of emerging technologies in society, and novel ways of introducing technology into formal education for future generations. The project presents an integrative participatory approach to Computational Empowerment focusing on digital literacy, agency and democratisation of technology. The approach addressed three levels of operation; *participatory practices* that included students, teachers, stakeholder and politicians at different levels of authority; the development of *educational practices* to engage diverse students in critical, reflective and creative modes of learning and design; and the design and application of diverse *digital tools* to leverage engagement and understanding of increasingly opaque technologies [138, 170]. The integrated PD approach aimed to both advance new educational practices in the classroom, build teachers' competencies, and create input to national curricula at policy level towards a new subject of technology comprehension in Danish primary and secondary educaiton. The interdisciplinary and political research context demanded a high investment of resources into long-term relations, *infrastructuring*, *networking* and *knotworking* activities [41] that included diverse stakeholders to create design impact at scale. The project demonstrates how a decade of persistent political PD engagement, with clear goals of societal transformation, citizen empowerment and democratisation of technology, can foster design impact on local, national, international levels. The ambition and trajectory of the project extend across the agendas of politicising and transforming, where politicising is emphasised and explored in the project's fundamental research trajectory, and transforming is visible in the societal impact the ecology of projects and activities are activating and leveraging. These two agendas are visualised in Fig. 2 as iterative looping dimensions across design research and design impact towards transformation.

6.2 The agenda of *Diversifying*

The *Diversifying* agenda focuses on enabling agency, self-determination, justice or equity for diverse actors by actively engaging diverse contexts, regions, technologies, human and more-than-human domains, and by adopting practices and methodologies from diverse knowledge foundations and contexts. This agenda emphasises the need to pay close attention to voices and perspectives that are often marginalised and to engage them in design processes. The agenda focuses on diverse actors in society (human and more-than-human) as well as their technologies, territories, epistemologies (global North-South, East-West, etc.), methods and techniques. By working *across* technologies, societal groups, scales, professional categories and so on, contemporary PD is increasingly leading new re-configurations of participation [185], questioning how to sustain initiatives and long-term impact – including the full range of participants, moving beyond the project within a wider community of practice [77, 106, 155, 168] as well as wider onto-epistemological contexts and ecologies [7, 52, 91].
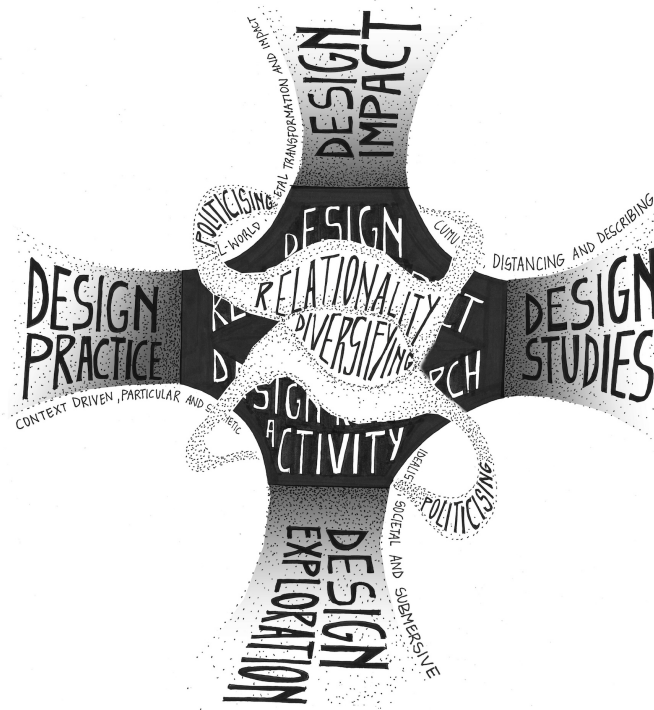
Figure 3: Example of HYBRID MATTER and decolonial memory projects working with agendas of *relationality* and *diversifying*.

While PD has always striven to be inclusive of diverse actors, rapid transformations due to socio-ecological transitions can undermine one's capacity for good and long-term choices involving human and more-than-human actors [92]. Within contemporary PD the discourse is primarily focussed on developing and scaling sustainable interventions in response to climate challenges. However, this is challenging because while biospheres and communities can be protected, the focus rarely questions the inherent boundaries among human and nature, self and other, and thus power imbalances among governments, diverse communities and ecosystems. PD work focused on sustainability through processes of entanglement and relationality is rooted in the environmental humanities, feminist science and technology studies (STS), new materialism and critiques of positivism and ontological practices. The *diversifying* agenda draws a more pluriversal picture of how humans and nature inter-depend, inter-relate, and co-exits, and how the growing diversity of actors involved in PD processes can learn to understand, reflect upon and tackle such pluriversality [72, 92, 118].

This pluriversal attention towards diversity was evident in the HYBRID MATTERS project [92], exploring one's relations with plastic through plastiglomerate (hybrids of plastic waste and natural materials) walks. During these walks, participants were invited to explore how plastiglomerates came into being, the practices that generated them, and how they can become a resource to live with. The project demonstrates the possibility and need to be specific in how more-than-human participation is shaped with diverse actors. It shows the value of getting familiar with such actors, while exploring alternative PD approaches to achieve that [123].

In the case of the participatory decolonial memory project, Namibian born-free youth engaged in exploring their colonial past through archival materials, everyday experiences and encounters with prevailing colonialism in the public space. Through dialogic curation and technological probing, participants co-created an interactive decolonial exhibition at Namibia's National Independence Museum, which challenged diverse relations among past(s), present(s) and future(s). The establishment of a "safe space" – a relational environment for thoughts, actions and mutual learning in political and contested contexts [110] – allowed participants to develop agency and courage to engage in collaborative and critical explorations of decolonial concerns Kambunga et al. [111], Smith et al. [171]. Additionally, the subsequent design of a global online pluriversal exhibition, enabled multiple epistemologies and relationalities on participatory memory making.

Both projects address hybridity and pluriversality as design exploration through the agenda of diversifying, while building an agenda of relationality towards generating societal impact. Temporal and ecological diversifying is at the centre of the research, with the ambition of shaping relationalities for more diverse forms of coexistence; building relations between contingent narratives, memories and knowledges – across global North(s) and South(s), and between humans and more-than-humans – explored through reflective design practices within society.

Such developments are emerging within PD research, embracing, for instance, decolonial and pluriversal thinking that comprises epistemology, worldviews, practices, and concerns in new ways. From another position, they show how specific agendas are targeted,
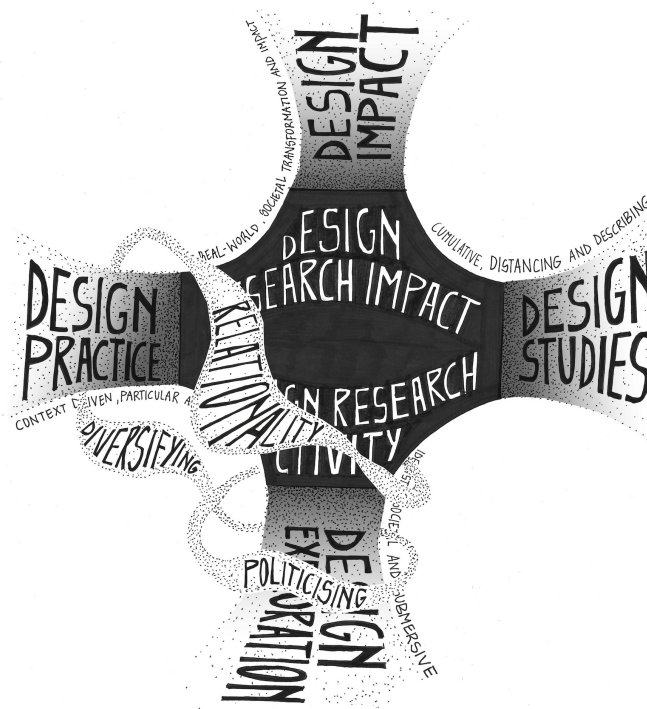
Figure 4: Introduction of AI/ML using EHR data in healthcare invoking the agenda of *relationality* while also integrating agendas of *politicising* and *diversifying*.

relating both to *politicising* through the inclusion and participation of all affected people and those traditionally excluded by diverse designed technologies, as well as the potential for future transformation, exploring avenues for change in contested societal contexts. These connect to relational decolonisation agendas where introspection, challenging hegemonies and responsibilities in situated actions become part of a wider decolonisation movement [191].

6.3 The agenda of *Relationality*

The agenda of *Relationality* acknowledges interconnectedness and co-existence across the globe and among researchers, practitioners, participants, and other actors, calibrating participation in responsible and caring ways. Given current global crises and socio-political contexts, we argue that contemporary PD research and practice must pay even more attention to relational practices, methods, tools, languages and focus their efforts to work across scales, cultural domains, human and more-than-human worlds. This implies rethinking which languages designers need to learn, utilise and be fluent in when they build relations and practice that has been articulated through diverse activities, including infrastructuring, commoning, and institutioning. The concept of infrastructuring [142, 176] has been adopted and positioned within contemporary PD as an empirical-ethnographic and generative-designerly resource [165] to extend the focus on participation (as social interactions in/of the design process) and the ability of researchers and practitioners to continuously reposition through responsible, ethical and caring

engagements and entanglements with diverse actors and communities across times and scales [48, 77, 135, 155, 190]. By extending design's focus beyond present and near-future temporal frames, infrastructuring includes past memories and collective or contested histories as a resource in designing futures, to capture what is happening in the foreground while paying attention to backstage and emotional labour associated with PD practice. This enables a strong PD research heritage and ensures inclusion of contested historical aspects and politics, while (re)building future discourses.

In section 4.1 we discussed a project showing how the introduction of AI in the healthcare sector can significantly impact clinician-entered, primary-use EHR data [85, 86]. This research shows the struggles that can emerge when relationality is not carefully considered, revealing the practical difficulties of deploying AI/ML in real-world healthcare settings, particularly in reconciling conflicting objectives for data usage. The relations are not only complex but dynamic and emerge and unfold over time. AI introduces a dual purpose for EHR data: its primary use by clinicians focuses on direct patient care and communication (see, e.g. [16], whereas its secondary use – driven by AI – extracts statistical insights or serves administrative, managerial, or economic purposes. A fundamental conflict arises when the recording of primary-use data must be altered to meet the meticulous requirements of AI-driven secondary use, potentially disrupting clinical workflows.

Figure 5: Example of Living Labs addressing agendas *politisising* and *transforming,* as well as *relationality* and *diversifying* through a focus on infrastructuring, commoning and more-than-human actors, technologies and species.

With its multiple, prolonged challenges across practice, project, organizational, and political levels, the project demonstrates a blurring of the boundaries between technical development and organizational implementation, revealing how implementing AI involves navigating complex and dynamic relations, including misaligned stakeholder expectations, concerns about data quality, and ethical dilemmas. Through the project [86] identified 14 key tactics to address and reconcile relational challenges among all actors and organizational/political levels. The tactics included, among others: *aligning* interests at the organization and practice levels; *reciprocating*, i.e. giving something to get something; *manifesting* to prove the project at the organization level; and *hibernating* as a response to adverse developments. These tactics illustrate concrete approaches to the agenda of relationality while also engaging secondarily with the agendas of *politicising* and *diversifying*. In Fig. 4 above we materialised the relationality agenda in the context of the discussed project, an iterative loop, connecting design exploration (developing the AI/ML product and service) with design practice (implementing and deploying the technology in a EHR system and healthcare setting).

6.4   The agenda of *Transforming*

Transforming means bringing transformative impact across multiple arenas and scales by addressing shifting societal challenges and through strong *participatory practices* that place the ambitions, challenges and future of collectives, societies, and the planet in the forefront. Contemporary PD must engage with the current landscape by tackling crucial concerns in diverse ways, from small acts of democratic engagement and future making to engagements at the policy and governmental level, or global concerns of human existence. By foregrounding participatory practices of situating and grounding, instead of generalising and universalising, solid and contextual PD processes, methods and techniques are crucial for embracing and connecting participatory initiatives and outcomes at different scales.

This agenda requires a move towards empirically grounded, situated and socio-material practices [28] and a focus on scoping and scaling PD efforts' outcomes and impact for particular communities and contexts [32, 38, 77, 168, 169]. This can be achieved by focusing research efforts to understand how to best transfer and teach PD to extend its reach [10, 50, 60, 64, 70, 89]. It can also be explored through a more direct engagement with designing for transformation and impact. These outcomes are created in circumstances of vast uncertainty, and go far beyond artefacts, systems, services or technology designs. Robust participatory practices, material engagements, and strong theoretical and methodological foundations are necessary to address current challenges [40, 166]. The continuous renewal of these practices is essential for building sustainable transformative futures and engaging with pervasive computational technologies and systems at scale.

As discussed by Smith et al. [169], many contemporary PD projects demonstrate a resilient and self-reflexive approach to real-world impact and transformation. Living Labs such as Andere Markt in Belgium [102] and Malmö Living Labs in Sweden [95], for example, refrain from designing solutions for (sub)urban issues and

instead 'live with' them over time, to learn how to carefully intervene and create collectives across human and more-than-human actors, between everyday life collectives and institutional contexts [99]. Malmö Living Labs gathered researchers, public and grass-roots organisations, companies and citizens in processes of joint democratic design experiments [67] to explore how processes of change in the city of Malmö could be further democratised and how to empower and give voice to groups and citizens with fewer resources than more powerful actors in industry and government. The team explored how new technology, collaborative services or social innovation can provide value to actors with fewer resources yet do so in the context of their everyday lives [96]. The Belgian Living Lab instead dealt with the taxing experiences that emerge when transitioning towards more sustainable relations with a landscape that is in challenging social, environmental and economic conditions and in a spatially dispersed urban organisation. The case shows how a Living Lab can focus on building collective capabilities in handling contemporary interconnected crises, while taking into account the role of more-than-human actors. These are tuned towards *revealing* the relations present in the space (e.g., local knowledge on sustainable food initiatives), followed by how they could be *articulated together* (commoning), collectively thinking and working on how they might be *reimagined*, and lastly connected within *institutional planning* projects (institutioning) [98, 179].

Working in these dispersed contexts requires time and intensive ongoing engagement of researchers within large and morphing networks and political agendas, which would not be possible in the context of a conventional spatial planning assignment. This confronts PD researchers with new important public roles and responsibilities as academic institutions in dealing with the current crises and challenges and how we can contribute through transformational PD research to the work conditions of public governments and private agencies.

Through more fundamentally researching the concepts and approaches as Living Labs for *transforming* over time and *diversifying* (sub)urban spaces as a design process, the projects investigate how the agendas of *politicising* and *relationality* can be brought to society, working with all political layers and human and more-than-human actors that are part of the city space. The agendas of *politicising* and *transforming* are placed in a dialogue to articulate the tensions and cross-roads between the attempts to politicize on the ground, while continuously keeping in mind what transformation means through shifting agencies between actors. Moreover, the *relationality* of the process in the field is continuously questioned in dialogue with the challenge of diversifying and how this can be achieved (see Fig. 5).

6.5 PD research agendas responding to contemporary crisis

Reviewing the discourses from the past ten years in PD and their ways of approaching (selected) socio-environmental, technological, and onto-epistemological crises, has resulted in the articulation of four research agendas for contemporary PD. While the politicising agenda has been central to PD since its inception, it has also continuously been challenged in the heydays of neoliberal society, and blossoming expansions of "participation" into all aspects of society [167], activating debates and advocacy to re-politicise the

field – hence including in our proposed agendas. At a high level, the four agendas call for articulating and enhancing the role and potentials of PD in the context of the overwhelming polycrisis of today, providing ways to:

- *reflect on the active role and participation of academic researchers and institutions* to ensure that each agenda is considered seriously, extend academic reflections on being part of societal transformations and impact, and to create new ways for academic work to engage with non-academic practice;
- *conceive new projects and programs,* carefully crafting how transitions are engaged in – not in instrumental ways, but as critical forces alongside multiple partners and stakeholders over time;
- *steer the "doing" and transformational impact* in and across projects, as programmatic research agendas that drive the research forward, while also undoing research actions if these are not beneficial
- *evaluate projects* beyond quantitative, predefined outcomes and effects, towards leveraging PD agendas as guidelines for diverse real-world engagements at different scales.

In our review, we observed and documented challenges in *institutioning* the PD research field by bringing situated PD research practices and approaches to public governments and private organisations that structure and govern societal transitions. To activate these agendas in the context of large transition processes – be they socio-ecological, technological, or onto-epistomological – we need socially innovative personal, private and public collectives, in order to strengthen the bigger collectives we are part of; our institutions, be they public governments, academic contexts or for-profit organisations. We need to reconsider our roles as PD researchers and practitioners, defined beyond organizations, as powerful knowledge generators and collectors, producing scientific and socio-economic impact, through stable mission-driven collectives striving for deep societal engagement and impact; a stable haven for preparing, following up and sustaining the transitions needed [62, 63]. For those of us employed at universities, this confronts us with our important public role and accountabilities in dealing with current crises. Although universities are also fragile institutions, and academic positions are precarious, we can direct responsible collective actions through international alliances and networks, to steer research agendas towards pursuing the necessary societal transformations.

What this impact must and can be is, of course, part of the ongoing discussion. But as reflections from Bødker and Ehn [42], two of PD's Scandinavian founders – like [80] at the beginning of this article - argue, our contributions are possibly most valuable when they are specific, local and situated and when larger impact is generated by entering dialogues with each other on these concrete contributions across scales:

> "In an era where computing is powerfully under the control of multinationals such as Apple, Google, and Meta, and soon OpenAI, Participatory Design does not seem to have much to offer in terms of specific methods and activities to the decision processes in everyday organisations where users (and management) struggle with empowering and infrastructuring to

make the most of the technologies that are available. Many suggestions for data-driven and activist agendas seem very far away. Hence, where "Participatory Design That Matters – Facing the Big Issues" by [43] suggested facing the big issues, I am suggesting here that Participatory Design may actually also need to return to some of the small and everyday issues of technology use at work" [42, p. 292].

"Maybe we could, with a little help from the thinkers and activists from earlier dark times in Europe, form a new Utopian vision for Participatory Design where "the banality of evil" is met by the "grace" of participation and design. But as in the early days of Participatory Design, this has to be concrete and specific. In Sweden, where I live, it would mean aligning with the work of the 135-year-old peace organisation "Svenska Freds". [..] So, my suggestion is not that Participatory Design could or should play a role in summit meetings, but, in the spirit of Participatory Design theory and practice, to find a new long-term orientation towards local peace-making engagements. I do not know if this is yet another Utopian dream, and it is certainly not to replace democratic design experiments, decolonial, more-than-human, and climate design activism, but maybe to make them possible" [42, p. 293].

What situated work aims to achieve in relation to contemporary challenges has been discussed in the Participatory Agenda Games workshops in the past year [101]. These experiments with the four research agendas demonstrate how they support researchers and practitioners (designers, practitioners, policy makers, etc.) to address contemporary crises in participatory ways, critically discussing the values of PD for debates and concrete transition processes towards rebalancing power imbalances and equitable futures. During these games, questions of how to articulate the agendas emerged. For instance; What are the unique ways of PD research and processes to 'articulate' and 'do' the participatory agendas? While the agendas are programmatic ambitions, design has its own ways of bringing them to the fore, through mediating, visualising, materialising, and reflective practices. How can these 'ways' become clearly articulated into their concrete potentials for societal design impact to collectives, governments and business?

In addition, discussions over the interrelations of agendas emerged, stimulating developments in this article. The expanded Fallman [73] model provides a lens through which to engage with and interconnect the agendas to harness the potential of PD for contemporary societal crisis. It shows that while people bring different understandings, readings and experiences to the agendas, they coexist and unfold through concrete projects in a multiplicity of ways. As an example, building *relationality* is necessary, but not all relations are equal, and therefore this agenda should be brought into dialogue with aspects of power and *politicising*. In contrast, *politicising*, understood as critically questioning power relations and values on the ground, is necessary to create computational alternatives, but it can paralyse projects if it does not remain in dialogue with ideas of building relations towards the ongoing *transformation* of specific crisis. These (inter)connections and positionalities in navigating

design research activities and impacts should be further explored in future research. In this article, through surveys, research agendas and examples of research practices, processes, theory and methodologies in contemporary PD, we have proposed a way to engage collectively in these dialogues, tensions and uncertainties in support of responsible societal futures.

7 CLOSING

In this article, we have addressed how contemporary PD is engaged in the context of intertwined and acute societal local and global crisis. Over the past decade, PD research, theory, and practice – along with its core values of participation, empowerment and democracy – have diversified and evolved in novel directions. By surveying how PD has engaged with socio-ecological, technological, and onto-epistemological crisis in the past decade, we have drawn a number of conclusions on its accountability, responsibilities and responsiveness to society in relation to past, present and future trajectories.

By bringing together diverse disciplines, continents and practices, we have reflected on how PD has addressed crises through particular agendas – explicitly or implicitly – and proposed four research agendas of *politicising, diversifying, relationality,* and *transforming*, to demonstrate how contemporary PD can be leveraged to address today's complex conditions. The lessons learned from the four agendas, combined with the expanded Fallman [73] model are offered as critical and reflective tools for PD to address design impact and societal crisis at scale. These contributions leverage PD's strong legacy, extending across HCI and IxD contexts, to engage directly in the creation of meaningful societal transformations. By offering calls for action, this article advocates for equitable, responsible, and future-oriented participatory research and practices that, while engaging with contemporary societal landscapes and global polycrises, directly contribute to the collaborative shaping of sustainable transitional futures.

Acknowledgments

References

[1] Margunn Aanestad, Miria Grisot, Ole Hanseth, and Polyxeni Vassilakopoulou. 2017. *Information Infrastructures and the Challenge of the Installed Base.* Springer International Publishing, Cham, 25–33. doi:10.1007/978-3-319-51020-0_3

[2] Ashraf Abdul, Jo Vermeulen, Danding Wang, Brian Lim, and Mohan Kankanhalli. 2018. Trends and Trajectories for Explainable, Accountable and Intelligible Systems. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (2018-04-21). ACM, 1–18. doi:10.1145/3173574.3174156

[3] Danah Abdulla, Ahmed Ansari, Ece Canlı, Mahmoud Keshavarz, Matthew Kiem, Pedro Oliveira, Luiza Prado, and Tristan Schultz. 2019. A Manifesto for Decolonising Design. *Journal of Futures Studies* 23, 3 (3 2019). doi:10.6531/JFS.201903_23(3).0012

[4] David Abram. 1996. The spell of the sensuous: perception and language in a more-than-human world.

[5] Rachel Adams. 2021. Can artificial intelligence be decolonized? *Interdisciplinary Science Reviews* 46, 1-2 (4 2021), 176–197. doi:10.1080/03080188.2020.1840225

[6] Yoko Akama, Juliette Anich, Areli Avendano Franco, Jaz Choi, Liam Fennessy, Marius Foley, Leah Heiss, Tania Ivanka, Emma Luke, Rowan Page, Tanja Rosenqvist, Juan Sanin, and Linus Tan. 2022. *Why are we here? A reflexive story*

of decolonising. Vol. 1. ACM, Newcastle upon Tyne United Kingdom, 26–35. doi:10.1145/3536169.3537777

[7] Yoko Akama, Ann Light, and Takahito Kamihira. 2020. Expanding Participation to Design with More-Than-Human Concerns. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1* (2020-06-15), Vol. 1. ACM, 1–11. doi:10.1145/3385010.3385016

[8] Jashvini Amirthalingam and Anika Khera. 2024. Understanding Social Media Addiction: A Deep Dive. *Cureus* (27 10 2024). doi:10.7759/cureus.72499

[9] Lars Andersen, Ditte Basballe, Lillian Buus, Christian Dindler, Thomas Hansen, Mikkel Hjorth, Ole Iversen, Christian Johannessen, Katrine Kanstrup, Rasmus Lorentzen, Morten Misfeldt, Line Musaeus, Camilla Nielsen, Marianne Petersen, Vibeke Schrøder, and Marie Slot. 2024. Infrastructuring digital literacy in K-12 education: A national case study. *International Journal of Child-Computer Interaction* 42 (12 2024), 100697. doi:10.1016/j.ijcci.2024.100697

[10] Barbara Andrews, Shaowen Bardzell, Andrew Clement, Vincenzo D'andrea, David Hakken, Giacomo Poderi, Jesper Simonsen, and Maurizio Teli. 2014. Teaching participatory design. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium papers, and Keynote abstracts - Volume 2* (2014-10-06), Vol. 2. ACM, Windhoek Namibia, 203–204. doi:10.1145/2662155.2662202

[11] RME de Araujo, Carlos André Lameirão Cortês, and Jackeline Lima Farbiarz. 2020. Design em Parceria: experiências de ensino de projeto em design fundamentadas na participação e no diálogo. In *Participatory Design Conference*, Vol. 19.

[12] Corina Balaban and Stefan De Jong. 2023. Academic identity at the intersection of global scientific communities and national science policies: societal impact in the UK and Netherlands. *Studies in Higher Education* 48, 6 (6 2023), 941–962. doi:10.1080/03075079.2023.2195424

[13] Liam Bannon, Jeffrey Bardzell, and Susanne Bødker. 2018. Introduction: Reimagining participatory design – Emerging voices. *ACM Transactions on Computer-Human Interaction* 25, 1 (13 2 2018), 1–8. doi:10.1145/3177794

[14] Liam Bannon and Pelle Ehn. 2013. *Routledge International Handbook of Participatory Design.* Routledge, 37–63. doi:10.4324/9780203108543

[15] Jørgen P. Bansler. 2021. Challenges in user-driven optimization of EHR: A case study of a large Epic implementation in Denmark. *International Journal of Medical Informatics* 148 (4 2021), 104394. doi:10.1016/j.ijmedinf.2021.104394

[16] Jørgen P. Bansler, Erling C. Havn, Kjeld Schmidt, Troels Mønsted, Helen Høgh Petersen, and Jesper Hastrup Svendsen. 2016. Cooperative Epistemic Work in Medical Practice: An Analysis of Physicians' Clinical Notes. *Computer Supported Cooperative Work (CSCW)* 25, 6 (12 2016), 503–546. doi:10.1007/s10606-016-9261-x

[17] Manuhuia Barcham. 2023. Design Processes and Tools as Oppression? Rethinking our Design Practice for more Just Design Outcomes. *Revista Diseña* 22, 22 (2023). doi:10.7764/disena.22.article.7

[18] Michelle Bastian. 2017. *Participatory research in more-than-human worlds.* Routledge. Taylor & Francis Group, London; New York, NY.

[19] Eevi E Beck. 2002. P for political: Participation is not enough. *Scandinavian Journal of Information Systems* 14, 1 (2002), 1.

[20] Niels Bentzon. 2016. *Destruktiv digitalisering: en debatbog om Sundhedsplatformen.* København N.

[21] Richard Besha, Liesbeth Huybrechts, and Wilbard Kombe. 2024. Co-designing with scarcity in self- organised urban environments: a case of Shekilango commercial street in Sinza, Dar es Salaam – Tanzania. *CoDesign* 20, 4 (10 2024), 781–797. doi:10.1080/15710882.2024.2377976

[22] Heidi Biggs, Shellye Suttles, and Shaowen Bardzell. 2023. Redlining Maps and Terrains of Sustainability: Interdisciplinary Mapping of Racialized Redlining to Present-Day Sustainability Agendas in HCI. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA, Article 141, 18 pages. doi:10.1145/3544548.3581491

[23] Abeba Birhane, William Isaac, Vinodkumar Prabhakaran, Mark Diaz, Madeleine Elish, Iason Gabriel, and Shakir Mohamed. 2022. *Power to the People? Opportunities and Challenges for Participatory AI.* ACM, Arlington VA USA, 1–8. doi:10.1145/3551624.3555290

[24] Abeba Birhane, Elayne Ruane, Thomas Laurent, Matthew S. Brown, Johnathan Flowers, Anthony Ventresque, and Christopher L. Dancy. 2022. *The Forgotten Margins of AI Ethics.* ACM, Seoul Republic of Korea, 948–958. doi:10.1145/3531146.3533157

[25] Gustavo Bittencourt and Karine Freire. 2022. Spirituality based codesign. In *Proceedings of the Participatory Design Conference 2022 - Volume 2* (2022-08-19), Vol. 2. ACM, Newcastle upon Tyne United Kingdom, 58–62. doi:10.1145/3537797.3537810

[26] Gro Bjerknes. 1989. *Computers and democracy: a Scandinavian challenge.* Avebury, Aldershot, Hampshire.

[27] Erling Björgvinsson and Mahmoud Keshavarz. 2020. *Partitioning Vulnerabilities: On the Paradoxes of Participatory Design in the City of Malmö.* Springer International Publishing, Cham, 247–266. doi:10.1007/978-3-030-37382-5_12

[28] Jeanette Blomberg and Helena Karasti. 2013. Reflections on 25 years of ethnography in CSCW. *Computer supported cooperative work (CSCW)* 22 (2013), 373–423.

[29] Susanne Bødker. 2003. A for Alternatives. *Scandinavian Journal of Information Systems* 15, 1 (2003), 1. https://aisel.aisnet.org/sjis/vol15/iss1/1

[30] Joanna Boehnert. 2019. Transition Design and Ecological Thought. *Cuadernos del Centro de Estudios de Diseño y Comunicación* 73, 73 (20 9 2019). doi:10.18682/cdc.vi73.1042

[31] Joanna Boehnert. 2024. *Ecological Theory in Design.* Number 2. Routledge, London, 71–83. doi:10.4324/9781003365433-7

[32] Claus Bossen, Christian Dindler, and Ole Iversen. 2016. Evaluation in participatory design. In *Proceedings of the 14th Participatory Design Conference: Full papers - Volume 1* (2016-08-15), Vol. 1. ACM, Aarhus Denmark, 151–160. doi:10.1145/2940299.2940303

[33] Claus Bossen, Reem Talhouk, and John Vines. 2025. *Scaling Participatory Design.* Number 1. Routledge, London, 27–50. doi:10.4324/9781003334330-3

[34] Robin Bourgeois, Geci Karuri-Sebina, and Kwamou Feukeu. 2024. The future as a public good: decolonising the future through anticipatory participatory action research. *foresight* 26, 4 (8 2024), 533–549. doi:10.1108/fs-11-2021-0225

[35] Suzan Boztepe, Jörn Christiansson, Amalia De Götzen, Leigh-Anne Hepburn, and Turkka Keinonen. 2024. Rethinking design in the public sector: A relational turn. doi:10.57698/V18I3.01

[36] Tone Bratteteig and Guri Verne. 2018. Does AI make PD obsolete?. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial - Volume 2* (2018-08-20), Vol. 2. ACM, 1–5. doi:10.1145/3210604.3210646

[37] Tone Bratteteig and Ina Wagner. 2012. Disentangling power and decision-making in participatory design. In *Proceedings of the 12th Participatory Design Conference: Research Papers - Volume 1* (Roskilde, Denmark) *(PDC '12)*. Association for Computing Machinery, New York, NY, USA, 41–50. doi:10.1145/2347635.2347642

[38] Tone Bratteteig and Ina Wagner. 2016. Unpacking the Notion of Participation in Participatory Design. *Computer Supported Cooperative Work (CSCW)* 25, 6 (Sept. 2016), 425–475. doi:10.1007/s10606-016-9259-4

[39] Keld Bødker, Jesper Kensing, and Simonsen. 2004. . MIT Press.

[40] Susanne Bødker, Christian Dindler, Ole Iversen, and Rachel Smith. 2022. *Participatory Design.* Springer International Publishing, Cham. doi:10.1007/978-3-031-02235-7

[41] Susanne Bødker, Christian Dindler, and Ole Sejer Iversen. 2017. Tying Knots: Participatory Infrastructuring at Work. *Computer Supported Cooperative Work (CSCW)* 26, 1–2 (Feb. 2017), 245–273. doi:10.1007/s10606-017-9268-y

[42] Susanne Bødker and Pelle Ehn. 2025. *Afterthoughts for an Emergent Future.* Number 1. Routledge, London, 291–293. doi:10.4324/9781003334330-16

[43] Susanne Bødker and Morten Kyng. 2018. Participatory Design that Matters—Facing the Big Issues. *ACM Transactions on Computer-Human Interaction* 25, 1 (13 2 2018), 1–31. doi:10.1145/3152421

[44] Marisol De La Cadena and Mario Blaser. 2018. A World of Many Worlds. doi:10.1215/9781478004318

[45] Jan Carlsson, Pelle Ehn, Barbo Erlander, Maja-Lisa Perby, and Åke Sandberg. 1978. Planning and control from the perspective of labour: A short presentation of the demos project. *Accounting, Organizations and Society* 3, 3-4 (1 1978), 249–260. doi:10.1016/0361-3682(78)90016-8

[46] Anne Chahine. 2024. Future memory work: unsettling temporal Othering through speculative research practices. *Qualitative Research* 24, 2 (4 2024), 189–208. doi:10.1177/14687941221129804

[47] Neeraj Chatlani, Arianna Davis, Karla Badillo-Urquiola, Elizabeth Bonsignore, and Pamela Wisniewski. 2023. Teen as research-apprentice: A restorative justice approach for centering adolescents as the authority of their own online safety. *International Journal of Child-Computer Interaction* 35 (3 2023), 100549. doi:10.1016/j.ijcci.2022.100549

[48] Jaz Hee-jeong Choi, Laura Forlano, and Denisa Kera. 2020. Situated Automation: Algorithmic Creatures in Participatory Design. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2* (Manizales, Colombia) *(PDC '20)*. Association for Computing Machinery, New York, NY, USA, 5–9. doi:10.1145/3384772.3385153

[49] Aziz Choudry. 2022. Social Movement Research in/and Struggles for Change: Research for What and For Whom? *Education as Change* 26 (24 11 2022). doi:10.25159/1947-9417/11337

[50] Jörn Christiansson, Erik Grönvall, and Signe Yndigegn. 2018. Teaching participatory design using live projects. In *Proceedings of the 15th Participatory Design Conference: Full Papers - Volume 1* (2018-08-20), Vol. 1. ACM, 1–11. doi:10.1145/3210586.3210597

[51] Adele Clarke and Theresa Montini. 1993. The Many Faces of RU486: Tales of Situated Knowledges and Technological Contestations. *Science, Technology, & Human Values* 18, 1 (1 1993), 42–78. doi:10.1177/016224399301800104

[52] Rachel Clarke, Sara Heitlinger, Ann Light, Laura Forlano, Marcus Foth, and Carl Disalvo. 2019. More-than-human participation. *Interactions* 26, 3 (23 4 2019), 60–63. doi:10.1145/3319075

[53] Rachel Clarke, Reem Talhouk, Ahmed Beshtawi, Kefah Barham, Owen Boyle, Mark Griffiths, and Matt Baillie Smith. 2022. *Decolonising in, by and through participatory design with political activists in Palestine.* Vol. 1. ACM, Newcastle upon Tyne United Kingdom, 36–49. doi:10.1145/3536169.3537778

[54] Henry Collier and Charlotte Morton. 2024. Teenagers: A Social Media Threat Vector. *International Conference on Cyber Warfare and Security* 19, 1 (21 3 2024), 55–61. doi:10.34190/iccws.19.1.1980

[55] Andy Dearden and Haider Rizvi. 2008. Participatory IT design and participatory development: a comparative review. In *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008* (Bloomington, Indiana) *(PDC '08).* Indiana University, USA, 81–91.

[56] Chiara Del Gaudio, Samara Tanaka, and Douglas Pastori. 2021. Between Dissent and Consensus, Resistance and Counter-Resistance: Design Practice as a Common Project-Process for Plural Possibilities of Being and Becoming. *Temes de Disseny* 37, 37 (22 7 2021), 157–181. doi:10.46467/tdd37.2021.157-181

[57] Andrew DeMillo. 2025. Banning cellphones in schools gains popularity in red and Blue States. https://apnews.com/article/school-cell-phone-bans-states-e6d1fe8ddfde33f086d5cd2a19f4c148

[58] Virginia Dignum. 2019. *Responsible artificial intelligence: how to develop and use AI in a responsible way.* Vol. 2156. Springer.

[59] Christian Dindler, Rachel Smith, and Ole Iversen. 2020. Computational empowerment: participatory design in education. *CoDesign* 16, 1 (2 1 2020), 66–80. doi:10.1080/15710882.2020.1722173 arXiv:https://doi.org/10.1080/15710882.2020.1722173

[60] Betsy Disalvo and Jason Yip. 2017. Participatory Design for Learning. *Participatory Design for Learning: Perspectives from Practice and Research* 1 (25 5 2017). doi:10.4324/9781315630830

[61] Carl DiSalvo, Andrew Clement, and Volkmar Pipek. 2013. Communities: Participatory Design for, with and by communities. In *Routledge international handbook of participatory design.* Routledge, 182–209. doi:10.4324/9780203108543

[62] Julian Dobson and Ed Ferrari. 2023. *Reframing the Civic University: An Agenda for Impact.* Springer International Publishing, Cham. doi:10.1007/978-3-031-17686-9

[63] Julian Dobson and Femi Owolade. 2025. Resourcing universities to increase their civic impact: meeting challenges of communication, complexity and commitment. *Journal of Higher Education Policy and Management* (18 2 2025), 1–19. doi:10.1080/1360080x.2025.2461811

[64] Maria Chiara D'Arienzo, Valentina Boursier, and Mark D. Griffiths. 2019. Addiction to Social Media and Attachment Styles: A Systematic Literature Review. *International Journal of Mental Health and Addiction* 17, 4 (8 2019), 1094–1118. doi:10.1007/s11469-019-00082-5

[65] Pelle Ehn. 1988. *Work-oriented design of computer artifacts.* Ph. D. Dissertation. Umeå University, Faculty of Social Sciences.

[66] Pelle Ehn. 2017. *Learning in Participatory Design as I Found It (1970–2015).* Number 1. Routledge, New York, NY, 7–21. doi:10.4324/9781315630830-3

[67] Pelle Ehn, Elisabet M. Nilsson, and Richard Topgaard (Eds.). 2014. *Making Futures.* The MIT Press. doi:10.7551/mitpress/9874.001.0001

[68] Damian Okaibedi Eke, Kutoma Wakunuma, and Akintoye Simisola (Eds.). 2023. *Responsible AI in Africa.* Springer International Publishing, Cham. doi:10.1007/978-3-031-08215-3

[69] Gunnar Ellingsen, Miria Grisot, Morten Hertzum, Anna Sigridur, and Islind. 2024. Implementing Electronic Health Records - Objectives, Obstacles, Outcomes. doi:10.48340/ECSCW2024_WS01

[70] Mette Agger Eriksen, Seppe De Blust, Oswald Devish, Christian Dindler, Carl DiSalvo, Anna Seravalli, and Majken Toftager Larsen. 2022. Expanding Learning in Participatory Design. In *Proceedings of the Participatory Design Conference 2022 - Volume 2* (2022-08-19) *(PDC 2022, Vol. 2).* ACM, Newcastle upon Tyne United Kingdom, 233–235. doi:10.1145/3537797.3537842

[71] Arturo Escobar. 2018. *Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds.* Duke University Press.

[72] Arturo Escobar. 2020. *Pluriversal Politics.* Duke University Press. doi:10.1215/9781478012108

[73] Daniel Fallman. 2008. The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. *Design Issues* 24, 3 (7 2008), 4–18. doi:10.1162/desi.2008.24.3.4

[74] Orlando Fals-Borda. 2003. Ante la crisis del país: ideas-acción para el cambio. *Ancora Editores : Panamericana Editorial* (2003).

[75] Michelle Faverio and Olivia Sidoti. 2024. Teens, social media and technology 2024. (2024).

[76] Constance Frantz Fanon, Frantz Farrington, and Fanon. 2002. . Grove Press, New York.

[77] Christopher Frauenberger, Marcus Foth, and Geraldine Fitzpatrick. 2018. On scale, dialectics, and affect. In *Proceedings of the 15th Participatory Design Conference: Full Papers - Volume 1* (2018-08-20), Vol. 1. ACM, 1–13. doi:10.1145/3210586.3210591

[78] Christopher Frauenberger, Rachel Charlotte Smith, Daria Loi, Laura Forlano, and Ole Sejer Iversen. 2024. *Emerging Technologies and Alternative Futures.* Routledge, 139–164. doi:10.4324/9781003334330-7

[79] Tony Fry. 2020. *Defuturing.* Bloomsbury Publishing Plc, London. doi:10.5040/9781350089563

[80] Tony Fry and Adam Nocek. 2020. *Design in Crisis: New Worlds, Philosophies and Practices.* Routledge. doi:10.4324/9781003021469

[81] AL Garcés. 2020. Revitalización de saberes ancestrales y diseño participativo. Co-diseño de un juego comunitario. *Participación (es) Otras/Participation (s) Otherwise* 3 (2020).

[82] Adriana Garcia, Juan Maestre, Manuhuia Barcham, Marilyn Iriarte, Marisol Wong-Villacres, Oscar Lemus, Palak Dudani, Pedro Reynolds-Cuéllar, Ruotong Wang, and Teresa Cerratto Pargman. 2021. Decolonial Pathways: Our Manifesto for a Decolonizing Agenda in HCI Research and Design. *Yokohama Japan* (8 5 2021), 1–9. doi:10.1145/3411763.3450365

[83] Aakash Gautam. 2024. *Reconfiguring Participatory Design to Resist AI Realism.* ACM, Sibu Malaysia, 31–36. doi:10.1145/3661455.3669867

[84] Albarrán Diana González. 2022. Corazonar: Weaving values into the heart of design research. In *Proceedings of the Participatory Design Conference* (2022-08-19), Vol. 2. ACM, Newcastle upon Tyne United Kingdom, 33–38. doi:10.1145/3537797.3537805

[85] Christopher Gyldenkaerne, Gustav From, Troels Mønsted, and Jesper Simonsen. 2020. PD and The Challenge of AI in Health-Care. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2* (Manizales, Colombia) *(PDC '20).* Association for Computing Machinery, New York, NY, USA, 26–29. doi:10.1145/3384772.3385138

[86] Christopher Gyldenkærne, Jens Hansen, Morten Hertzum, and Troels Mønsted. 2024. Innovation tactics for implementing an ML application in healthcare: A long and winding road. *International Journal of Human-Computer Studies* 181 (1 2024), 103162. doi:10.1016/j.ijhcs.2023.103162

[87] Barbara Göbl, Elisabeth Guenther, Fares Kayali, and Christopher Frauenberger. 2023. Situating computational empowerment in formal education: A multi-perspective view. *International Journal of Child-Computer Interaction* 38 (12 2023), 100604. doi:10.1016/j.ijcci.2023.100604

[88] Philipp Hartmann and Joachim Henkel. 2020. The Rise of Corporate Science in AI: Data as a Strategic Resource. *Academy of Management Discoveries* (9 4 2020). doi:10.5465/amd.2019.0043

[89] K Maike Hecht and Susanne Maass. 2008. Teaching participatory design.. In *PDC.* 166–169.

[90] Sara Heitlinger, Marcus Foth, and Rachel Clarke. 2024. *Designing more-than-human smart cities: Beyond sustainability, towards cohabitation.* Oxford University Press.

[91] Sara Heitlinger, Marcus Foth, Rachel Clarke, Carl Disalvo, Ann Light, and Laura Forlano. 2018. Avoiding ecocidal smart cities. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial - Volume 2* (2018-08-20), Vol. 2. ACM, 1–3. doi:10.1145/3210604.3210619

[92] Sara Heitlinger, Ann Light, Yoko Akama, Kristina Lindström, and Åsa Ståhl. 2025. *More-Than-Human Participatory Design.* Routledge, 79–110. doi:10.4324/9781003334330-5

[93] Morten Hertzum, Gunnar Ellingsen, and Åsa Cajander. 2022. Implementing Large-Scale Electronic Health Records: Experiences from implementations of Epic in Denmark and Finland. *International Journal of Medical Informatics* 167 (11 2022), 104868. doi:10.1016/j.ijmedinf.2022.104868

[94] Morten Hertzum and Jesper Simonsen. 2019. Configuring information systems and work practices for each other: What competences are needed locally? *International Journal of Human-Computer Studies* 122 (2 2019), 242–255. doi:10.1016/j.ijhcs.2018.10.006

[95] Per-Anders Hillgren, Per Linde, Alicia Smedberg, Elisabet M. Nilsson, Pelle Ehn, and Mette Agger Eriksen. 2025. *Living Labs for Open-Ended Participatory Design.* Routledge, 259–271. doi:10.4324/9781003334330-14

[96] Per-Anders Hillgren, Anna Seravalli, and Anders Emilson. 2011. Prototyping and infrastructuring in design for social innovation. *CoDesign* 7, 3-4 (9 2011), 169–183. doi:10.1080/15710882.2011.630474

[97] Knut Kjetil Holgeid, Magne Jørgensen, Dag I. K. Sjøberg, and John Krogstie. 2021. Benefits management in software development: A systematic review of empirical studies. *IET Software* 15, 1 (2 2021), 1–24. doi:10.1049/sfw2.12007

[98] Liesbeth Huybrechts, Henric Benesch, and Jon Geib. 2017. Institutioning: Participatory Design, Co-Design and the public realm. *CoDesign* 13, 3 (3 7 2017), 148–159. doi:10.1080/15710882.2017.1355006

[99] Liesbeth Huybrechts, Oswald Devisch, and Virginia Tassinari. 2022. Beyond polarisation: reimagining communities through the imperfect act of ontologising. *CoDesign* 18, 1 (1 2022), 63–77. doi:10.1080/15710882.2021.2001537

[100] Liesbeth Huybrechts and Niels Hendriks. 2016. Counterfactual scripting. In *Proceedings of the 14th Participatory Design Conference: Full papers - Volume 1* (2016-08-15), Vol. 1. ACM, Aarhus Denmark, 111–120. doi:10.1145/2940299.2940304

[101] Liesbeth Huybrechts, Rachel Smith, Heike Winschiers-Theophilus, Daria Loi, and Jesper Simonsen. 2024. Participatory Design in a Changing World: A Situated Action. In *Proceedings of the Participatory Design Conference 2024: Situated Actions, Doctoral Colloquium, PDC places, Communities - Volume 3*

(2024-08-11), Vol. 3. ACM, Sibu Malaysia, 59–61. doi:10.1145/3661456.3666065

[102] Liesbeth Huybrechts, Maurizio Teli, Joanna Saad-Sulonen, and Mariacristina Sciannamblo. 2025. *Collectives and Participatory Design.* Routledge, 51–78. doi:10.4324/9781003334330-4

[103] Netta Iivari, Leena Ventä-Olkkonen, Heidi Hartikainen, and Sumita Sharma. 2024. *Participatory design that matters – with activism education of children.* ACM, Sibu Malaysia, 221–233. doi:10.1145/3666094.3666108

[104] Nanna Inie, Jeanette Falk, and Steven Tanimoto. 2023. . doi:10.48550/ARXIV. 2303.08931

[105] Ole Sejer Iversen, , and Christian Dindler. 2013. A Utopian agenda in child-computer interaction. *International Journal of Child-Computer Interaction* 1, 1 (1 2013), 24–29. doi:10.1016/j.ijcci.2012.08.002

[106] Ole Sejer Iversen and Christian Dindler and. 2014. Sustaining participatory design initiatives. *CoDesign* 10, 3-4 (2014), 153–170. doi:10.1080/15710882.2014. 963124 arXiv:https://doi.org/10.1080/15710882.2014.963124

[107] Ole Sejer Iversen, Rachel Charlotte Smith, and Christian Dindler. 2017. Child as Protagonist: Expanding the Role of Children in Participatory Design. In *Proceedings of the 2017 Conference on Interaction Design and Children* (2017-06-27) *(IDC '17)*. ACM, Stanford California USA, 27–37. doi:10.1145/3078072.3079725

[108] Ole Sejer Iversen, Rachel Charlotte Smith, and Christian Dindler. 2018. From computational thinking to computational empowerment: a 21st century PD agenda. *Hasselt and Genk Belgium* 1 (20 8 2018), 1–11. doi:10.1145/3210586. 3210592

[109] Asnath Paula Kambunga, Rachel Charlotte Smith, and Heike Winschiers-Theophilus. 2024. Extending temporalities in design: designing pluriversal futures. *CoDesign* 20, 1 (1 2024), 36–54. doi:10.1080/15710882.2024.2363914

[110] Asnath Paula Kambunga, Rachel Charlotte Smith, Heike Winschiers-Theophilus, and Ton Otto. 2023. Decolonial design practices: Creating safe spaces for plural voices on contested pasts, presents, and futures. *Design Studies* 86 (5 2023), 101170. doi:10.1016/j.destud.2023.101170

[111] Asnath Paula Kambunga, Rachel Charlotte Smith, Heike Winschiers-Theophilus, Nathaly Pinto, Xavier Barriga Abril, Laura Boffi, Emmanuel Dzisi, Tariq Zaman, Desiree Hernandez Ibinarriaga, Anne Chahine, Laura Lennert Jensen, and Vivi Vold. 2021. Pluriversal Design: A Virtual Decolonising Exhibition. doi:10.18420/ CT2021-063

[112] Helena Karasti. 2014. Infrastructuring in participatory design. In *Proceedings of the 13th Participatory Design Conference on Research Papers - PDC '14* (2014). ACM Press, Windhoek, Namibia, 141–150. doi:10.1145/2661435.2661450

[113] Timothy Kariotis and Darakhshan J. Mir. 2020. Fighting Back Algocracy. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2* (2020-06-15), Vol. 2. ACM, Manizales Colombia, 148–153. doi:10.1145/3384772.3385151

[114] Finn Kensing and Joan Greenbaum. 2012. Heritage: Having a say. In *Routledge international handbook of participatory design.* Routledge, 21–36.

[115] Marianne Kinnula and Netta Iivari. 2021. Manifesto for children's genuine participation in digital technology design and making. *International Journal of Child-Computer Interaction* 28 (6 2021), 100244. doi:10.1016/j.ijcci.2020.100244

[116] Gertraud Koch, Gábor Bella, Paula Helm, and Fausto Giunchiglia. 2024. Layers of technology in pluriversal design decolonising language technology with the live language initiative. *CoDesign* 20, 1 (2 1 2024), 77–90. doi:10.1080/15710882. 2024.2341799

[117] Henrik Korsgaard, Peter Lyle, Joanna Saad-Sulonen, Clemens Klokmose, Midas Nouwens, and Susanne Bødker. 2022. Collectives and Their Artifact Ecologies. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (7 11 2022), 1–26. doi:10.1145/3555533

[118] Thomas Laurien, Li Jönsson, Petra Lilja, Kristina Lindström, Erik Sandelin, and Åsa Ståhl. 2022. *An Emerging Posthumanist Design Landscape.* Springer International Publishing, Cham, 469–491. doi:10.1007/978-3-031-04958-3_42

[119] Shaimaa Lazem, Danilo Giglitto, Makuochi Nkwo, Hafeni Mthoko, Jessica Upani, and Anicia Peters. 2022. Challenges and Paradoxes in Decolonising HCI: A Critical Discussion. *Computer Supported Cooperative Work (CSCW)* 31, 2 (6 2022), 159–196. doi:10.1007/s10606-021-09398-0

[120] Maggie C.M. Lee, Helana Scheepers, Ariel K.H. Lui, and Eric W.T. Ngai. 2023. The implementation of artificial intelligence in organizations: A systematic literature review. *Information & Management* 60, 5 (7 2023), 103816. doi:10. 1016/j.im.2023.103816

[121] Renata Leitão and Lesley-Ann Noel. 2022. Special Forum: Designing a World of Many Centers. *Design and Culture* 14, 3 (2 9 2022), 247–253. doi:10.1080/ 17547075.2022.2110796

[122] Phoebe Lin and Jessica Van Brummelen. 2021. Engaging Teachers to Co-Design Integrated AI Curriculum for K-12 Classrooms. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (2021-05-06). ACM, Yokohama Japan, 1–12. doi:10.1145/3411764.3445377

[123] Kristina Lindström and Åsa Ståhl. 2017. Plastic imaginaries. *continent.* 6, 1 (2017), 62–76.

[124] Björn Lindström, Martin Bellander, David Schultner, Allen Chang, Philippe Tobler, and David Amodio. 2021. A computational reward learning account

[125] Daria Loi. 2023. Diamonds of Sadness: A Story of High-Tech Greed, Power, and Hypocrisy. *Interactions* 30, 3 (5 2023), 26–28. doi:10.1145/3587941

[126] Daria Loi and Raphael Arar. 2024. Participatory Design, Beyond. *Interactions* 31, 5 (9 2024), 15–17. doi:10.1145/3680297

[127] Daria Loi, Penny Hagen, and Raphael Arar. 2025. *Participatory Design Beyond Academia.* Routledge, 191–216. doi:10.4324/9781003334330-9

[128] Daria Loi, Thomas Lodato, Christine Wolf, Raphael Arar, and Jeanette Blomberg. 2018. PD manifesto for AI futures. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial - Volume 2* (2018-08-20), Vol. 2. ACM, 1–4. doi:10.1145/3210604.3210614

[129] Jonas Löwgren, Henrik Svarrer Larsen, and Mads Hobye. 2013. Towards programmatic design research. *Designs for Learning* 6, 1-2 (1 12 2013), 80. doi:10.2478/dfl-2014-0017

[130] Ana Maria Copetti Maccagnan and Guilherme Englert Corrêa Meyer. 2022. Stitching participations in a touch-oriented participatory design practice. In *Proceedings of the Participatory Design Conference 2022 - Volume 1* (Newcastle upon Tyne, United Kingdom) *(PDC '22)*. Association for Computing Machinery, New York, NY, USA, 183–193. doi:10.1145/3536169.3537792

[131] Matin Mahboob Kanafi, Netta Iivari, and Marianne Kinnula. 2022. *Brave and Kind Superheroes – Children's Reflections on the Design Protagonist Role.* Vol. 1. ACM, Newcastle upon Tyne United Kingdom, 87–97. doi:10.1145/3536169.3537783

[132] Henry Mainsah and Andrew Morrison. 2014. 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* (Windhoek, Namibia) *(PDC '14)*. Association for Computing Machinery, New York, NY, USA, 83–86. doi:10.1145/2662155.2662195

[133] Laura Malinverni, Marie-Monique Schaper, Elisa Rubegni, and Mariana Tamashiro. 2025. Scaffolding Children's critical reflection on intelligent technologies: Opportunities from speculative fiction. *International Journal of Child-Computer Interaction* 43 (3 2025), 100727. doi:10.1016/j.ijcci.2025.100727

[134] Lynne Markus. 2004. Technochange Management: Using IT to Drive Organizational Change. *Journal of Information Technology* 19, 1 (3 2004), 4–20. doi:10.1057/palgrave.jit.2000002

[135] Sanna Marttila, Andrea Botero, and Joanna Saad-Sulonen. 2014. Towards commons design 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* (2014-10-06), Vol. 2. ACM, Windhoek Namibia, 9–12. doi:10.1145/2662155.2662187

[136] Ben Matthews, Skye Doherty, Jane Johnston, and Marcus Foth. 2022. The publics of design: Challenges for design research and practice. *Design Studies* 80 (5 2022), 101106. doi:10.1016/j.destud.2022.101106

[137] Alisia Maulidina, Widya Maulani, and Hendri Purnomo. 2024. The Digital Era and Teens: Analyzing the Influence of Multimedia on Social Media. *Secure And Knowledge-Intelligent Research in Cybersecurity And Multimedia (SAKIRA)* 2, 2 (Dec. 2024), 43–48. doi:10.1234/j6qphx34

[138] Maarten Van Mechelen, Rachel Charlotte Smith, Marie-Monique Schaper, Mariana Tamashiro, Karl-Emil Bilstrup, Mille Lunding, Marianne Graves Petersen, and Ole Sejer Iversen. 2022. Emerging Technologies in K–12 Education: A Future HCI Research Agenda. *ACM Transactions on Computer-Human Interaction* 30, 3 (10 2022), 1–40. doi:10.1145/3569897

[139] Walter Mignolo and Catherine Walsh. 2018. On Decoloniality: Concepts, analytics, praxis. Duke University Press. doi:10.2307/j.ctv11g9616

[140] Walter D. Mignolo. 2007. DELINKING: The rhetoric of modernity, the logic of coloniality and the grammar of de-coloniality. *Cultural Studies* 21, 2-3 (3 2007), 449–514. doi:10.1080/09502380601162647

[141] Luis Morales-Navarro, Naomi Thompson, Yasmin Kafai, Mia Shaw, and Nichole Pinkard. 2022. *Reimagining and Co-designing with Youth an Hour of Code Activity for Critical Engagement with Computing.* ACM, Braga Portugal, 288–296. doi:10. 1145/3501712.3529730

[142] Laura J Neumann and Susan Leigh Star. 1996. Making infrastructure: The dream of a common language. In *PDC.* 231–240.

[143] Iohanna Nicenboim, Doenja Oogjes, Heidi Biggs, and Seowoo Nam. 2023. Decentering Through Design: Bridging Posthuman Theory with More-than-Human Design Practices. *Human–Computer Interaction* 40, 1–4 (Nov. 2023), 195–220. doi:10.1080/07370024.2023.2283535

[144] Lesley-Ann Noel, Adolfo Ruiz, Frederick Van Amstel, Victor Udoewa, Neeta Verma, Nii Botchway, Arvind Lodaya, and Shalini Agrawal. 2023. Pluriversal Futures for Design Education. *She Ji: The Journal of Design, Economics, and Innovation* 9, 2 (2023), 179–196. doi:10.1016/j.sheji.2023.04.002

[145] Sverre Norberg-Schultz Hagen, Guri Verne, and Tone Bratteteig. 2020. "All celebrities and sports on top". In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1* (2020-06-15), Vol. 1. ACM, Manizales Colombia, 22–32. doi:10.1145/3385010.3385025

[146] Donald A Norman. 2023. *Design for a better world: Meaningful, sustainable, humanity centered.* MIT Press.

[147] Kristen Nygaard and Olav Terje Bergo. 1975. The Trade Unions - New users of research. *Personnel Review* 4, 2 (1 2 1975), 5–10. doi:10.1108/eb055278

[148] Karoline B. Osnes, Julie R. Olsen, Polyxeni Vassilakopoulou, and Eli Hustad. 2018. ERP Systems in Multinational Enterprises: A literature Review of Post-implementation Challenges. *Procedia Computer Science* 138 (2018), 541–548. doi:10.1016/j.procs.2018.10.074

[149] Toks Dele Oyedemi. 2020. Digital coloniality and 'Next Billion Users': the political economy of Google Station in Nigeria. *Information, Communication & Society* 24, 3 (Aug. 2020), 329–343. doi:10.1080/1369118x.2020.1804982

[150] Nathaly Pinto, Brenda Vertiz, and Andrea Botero. 2022. Resistance, social reproduction and emerging commitments for collaborative design from the margins. In *Proceedings of DRS* (2022-06-25). Design Research Society. doi:10.21606/drs.2022.648

[151] Giacomo Poderi and Yvonne Dittrich. 2018. Participatory design and sustainability. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial - Volume 2* (2018-08-20), Vol. 2. ACM, 1–5. doi:10.1145/3210604.3210624

[152] Tania Pérez-Bustos, Laura Cortés-Rico, and Andrea Botero. 2025. *Reconciliation Through Digital Textiles.* Routledge, 247–258. doi:10.4324/9781003334330-13

[153] Pedro Reynolds-Cuéllar, Marisol Wong-Villacres, Karla Badillo-Urquiola, Mayra Barrera Machuca, Franceli Cibrian, Marianela Ciolfi Felice, Carolina Fuentes, Laura Gaytán-Lugo, Vivian Genaro Motti, Monica Perusquia-Hernandez, and Oscar Lemus. 2023. Para Cima y Pa' Abajo: Building Bridges Between HCI Research in Latin America and in the Global North. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (2023-04-19). ACM, Hamburg Germany, 1–19. doi:10.1145/3544548.3581138

[154] Toni Robertson and Ina Wagner. 2013. *Routledge International Handbook of Participatory Design.* Routledge. doi:10.4324/9780203108543

[155] Joanna Saad-Sulonen, Eva Eriksson, Kim Halskov, Helena Karasti, and John Vines and. 2018. Unfolding participation over time in the design of IT. *CoDesign* 14, 1 (2018), 1–3. doi:10.1080/15710882.2018.1426981 arXiv:https://doi.org/10.1080/15710882.2018.1426981

[156] Calderon Salazar and Liesbeth Huybrechts. 2020. PD otherwise will be pluriversal (or it won't be). In *Proceedings of the 16th Participatory Design Conference 2020 - Participation* (2020-06-15), Vol. 1. ACM, Manizales Colombia, 107–115. doi:10.1145/3385010.3385027

[157] Boaventura de Sousa Santos. 2018. The end of the cognitive empire: the coming of age of epistemologies of the South.

[158] Marie-Monique Schaper, Rachel Smith, Ole Iversen, Christopher Frauenberger, Netta Iivari, Anja Zeising, Mike Tissenbaum, Elizabeth Bonsignore, and Jason Yip. 2023. Computational Empowerment and children: Expanding empowerment, agency and participation in computation. *International Journal of Child-Computer Interaction* 38 (12 2023), 100617. doi:10.1016/j.ijcci.2023.100617

[159] Marie-Monique Schaper, Rachel Smith, Mariana Tamashiro, Maarten Van Mechelen, Mille Lunding, Karl-Emil Kjær Bilstrup, Magnus Kaspersen, Kasper Jensen, Marianne Petersen, and Ole Iversen. 2022. Computational empowerment in practice: Scaffolding teenagers' learning about emerging technologies and their ethical and societal impact. *International Journal of Child-Computer Interaction* 34 (12 2022), 100537. doi:10.1016/j.ijcci.2022.100537

[160] Tristan Schultz, Danah Abdulla, Ahmed Ansari, Ece Canlı, Mahmoud Keshavarz, Matthew Kiem, Luiza Martins, and Pedro J.S. Vieira De Oliveira. 2018. What Is at Stake with Decolonizing Design? A Roundtable. *Design and Culture* 10, 1 (2 1 2018), 81–101. doi:10.1080/17547075.2018.1434368

[161] Donald Schön. 1987. The Reflective Practitioner. doi:10.4324/9781315237473

[162] Jesper Simonsen, Christian Dindler, and Chiara Del Gaudio. 2025. *New Approaches, Methods and Techniques.* Number 1. Routledge, Routledge, London, 165–189. doi:10.4324/9781003334330-8

[163] Jesper Simonsen and Morten Hertzum. 2022. Effects-Driven IT Improvement: Pursuing local post-implementation opportunities. *Scandinavian Journal of Information Systems* 34 (2022), 3–36.

[164] Jesper Simonsen, Morten Hertzum, and John Scheuer. 2018. Quality Development in Health Care: Participation vs. Accreditation. *Nordic Journal of Working Life Studies* 8 (12 4 2018). doi:10.18291/njwls.v8is3.105276

[165] Jesper Simonsen, Helena Karasti, and Morten Hertzum. 2020. Infrastructuring and Participatory Design: Exploring Infrastructural Inversion as Analytic, Empirical and Generative. *Computer Supported Cooperative Work (CSCW)* 29, 1-2 (4 2020), 115–151. doi:10.1007/s10606-019-09365-w

[166] Jesper Simonsen and Toni Robertson (Eds.). 2013. *Routledge International Handbook of Participatory Design.* Routledge. doi:10.4324/9780203108543

[167] Rachel Charlotte Smith, Claus Bossen, and Anne Marie Kanstrup and. 2017. Participatory design in an era of participation. *CoDesign* 13, 2 (2017), 65–69. doi:10.1080/15710882.2017.1310466 arXiv:https://doi.org/10.1080/15710882.2017.1310466

[168] Rachel Charlotte Smith and Ole Sejer Iversen. 2018. Participatory design for sustainable social change. *Design Studies* 59 (11 2018), 9–36. doi:10.1016/j.destud.2018.05.005

[169] Rachel Charlotte Smith, Daria Loi, Heike Winschiers-Theophilus, Liesbeth Huybrechts, and Jesper Simonsen. 2025. *Routledge International Handbook of Contemporary Participatory Design.* Routledge. doi:10.4324/9781003334330

[170] Rachel Charlotte Smith, Marie-Monique Schaper, Mariana Aki Tamashiro, Maarten Van Mechelen, Marianne Graves Petersen, and Ole Sejer Iversen. 2023. A research agenda for computational empowerment for emerging technology education. *International Journal of Child-Computer Interaction* 38 (2023), 100616. doi:10.1016/j.ijcci.2023.100616

[171] Rachel Charlotte Smith, Heike Winschiers-Theophilus, Rogério Abreu de Paula, Tariq Zaman, and Daria Loi and. 2024. Towards pluriversality: decolonising design research and practices. *CoDesign* 20, 1 (2024), 1–13. doi:10.1080/15710882.2024.2379704 arXiv:https://doi.org/10.1080/15710882.2024.2379704

[172] Rachel Charlotte Smith, Heike Winschiers-Theophilus, Daria Loi, Asnath Paula Kambunga, Marly Muudeni Samuel, and Rogerio de Paula. 2020. Decolonising Participatory Design Practices: Towards Participations Otherwise. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2* (Manizales, Colombia) *(PDC '20).* Association for Computing Machinery, New York, NY, USA, 206–208. doi:10.1145/3384772.3385172

[173] Alessandro Soro, Jennyfer Taylor, and Margot Brereton. 2019. *Designing the Past.* ACM, 1–10. doi:10.1145/3290607.3310424

[174] Nicola St John. 2020. *Ntaria design: a Western Arrarnta imagining of digital drawing and communication design.* Ph. D. Dissertation. Swinburne.

[175] Nicola St John. 2022. Working together with 'ilkwatharra' good feelings. In *Proceedings of the Participatory Design Conference* (2022-08-19), Vol. 2. ACM, Newcastle upon Tyne United Kingdom, 47–51. doi:10.1145/3537797.3537807

[176] Susan Leigh Star and Geoffrey C Bowker. 2006. How to infrastructure. *Handbook of new media: Social shaping and social consequences of ICTs* (2006), 230–245.

[177] Reem Talhouk and Sarah Armouch. 2022. Dialogues on Decolonial Participatory Design Praxis During a Revolution. In *Proceedings of the Participatory Design Conference 2022 - Volume 2* (2022-08-19), Vol. 2. ACM, Newcastle upon Tyne United Kingdom, 52–57. doi:10.1145/3537797.3537808

[178] Luca Tangi, Colin Van Noordt, and A Rodriguez Müller. 2023. The challenges of AI implementation in the public sector. An in-depth case studies analysis. In *Proceedings of the 24th Annual International Conference on Digital Government Research* (2023-07-11). ACM, 414–422. doi:10.1145/3598469.3598516

[179] Maurizio Teli, Marcus Foth, Mariacristina Sciannamblo, Irina Anastasiu, and Peter Lyle. 2020. Tales of Institutioning and Commoning. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1* (2020-06-15), Vol. 1. ACM, Manizales Colombia, 159–171. doi:10.1145/3385010.3385020

[180] Madina Tlostanova. 2017. On decolonizing design. *Design Philosophy Papers* 15, 1 (Jan. 2017), 51–61. doi:10.1080/14487136.2017.1301017 arXiv:https://doi.org/10.1080/14487136.2017.1301017

[181] David Touretzky, Christina Gardner-mccune, Cynthia Breazeal, Fred Martin, and Deborah Seehorn. 2019. A Year in K–12 AI Education. *AI Magazine* 40, 4 (12 2019), 88–90. doi:10.1609/aimag.v40i4.5289

[182] Maani Truu. 2024. Children to be banned from social media from next year after Parliament votes through world-first laws. https://www.abc.net.au/news/2024-11-28/social-media-age-ban-passes-parliament/104647138

[183] Victor Udoewa. 2022. An introduction to radical participatory design: decolonising participatory design processes. *Design Science* 8 (2022), 31. doi:10.1017/dsj.2022.24

[184] Frederick MC Van Amstel. 2023. Decolonizing design research. In *The Routledge companion to design research.* Routledge, 64–74.

[185] John Vines, Rachel Clarke, Peter Wright, John McCarthy, and Patrick Olivier. 2013. Configuring participation: on how we involve people in design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Paris, France) *(CHI '13).* Association for Computing Machinery, New York, NY, USA, 429–438. doi:10.1145/2470654.2470716

[186] Ron Wakkary. 2021. *Things we could design: For more than human-centered worlds.* MIT press.

[187] Ron Wakkary. 2024. *More-than-Human Biographies: Designing for their Endings.* Oxford University PressOxford, 305–326. doi:10.1093/9780191980060.003.0017

[188] Kutoma Wakunuma, Fabio Castro, Tilimbe Jiya, Edurne Inigo, Vincent Blok, and Vincent Bryce. 2021. Reconceptualising responsible research and innovation from a Global South perspective. *Journal of Responsible Innovation* 8, 2 (4 5 2021), 267–291. doi:10.1080/23299460.2021.1944736

[189] Feier Wang. 2024. The Impact of Social Media Addiction on Teenagers. *Communications in Humanities Research* 43, 1 (8 11 2024), 174–179. doi:10.54254/2753-7064/43/20240163

[190] Heike Winschiers-Theophilus, Shilumbe Chivuno-Kuria, Gereon Koch Kapuire, Nicola J. Bidwell, and Edwin Blake. 2010. Being participated: a community approach. In *Proceedings of the 11th Biennial Participatory Design Conference* (Sydney, Australia) *(PDC '10).* Association for Computing Machinery, New York, NY, USA, 1–10. doi:10.1145/1900441.1900443

[191] Heike Winschiers-Theophilus, Rachel Charlotte Smith, Frederick M. C. van Amstel, and Andrea Botero. 2025. *Decolonisation and Participatory Design.* Number 1. Routledge, Routledge, London, 111–137. doi:10.4324/9781003334330-

6

[192] Heike Winschiers-Theophilus, Tariq Zaman, and Colin Stanley. 2019. A classification of cultural engagements in community technology design: introducing a transcultural approach. *AI & SOCIETY* 34, 3 (9 2019), 419–435. doi:10.1007/s00146-017-0739-y

[193] Christine Wolf and Jeanette Blomberg. 2020. Ambitions and Ambivalences in Participatory Design: Lessons from a Smart Workplace Project. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation* (2020-06-15), Vol. 1. ACM, Manizales Colombia, 193–202. doi:10.1145/3385010.3385029

[194] Marta Natalia Wróblewska. 2021. Research impact evaluation and academic discourse. *Humanities and Social Sciences Communications* 8, 1 (3 2021), 58. doi:10.1057/s41599-021-00727-8

[195] Betelhem Zewdu Wubineh, Fitsum Gizachew Deriba, and Michael Melese Woldeyohannis. 2024. Exploring the opportunities and challenges of implementing artificial intelligence in healthcare: A systematic literature review. *Urologic Oncology: Seminars and Original Investigations* 42, 3 (3 2024), 48–56. doi:10.1016/j.urolonc.2023.11.019