Universal Design as a Tool for Change

Danish Architectural Press

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Universal design is a value-based multidisciplinary concept which requires interdisciplinary collaboration and investigation in both development and practice.

As defined in the UN Convention on the Rights of Persons with Disabilities (CRPD), the concept is a multidisciplinary means to secure equitable and dignified participation and inclusion in society, regardless of abilities or disabilities. The concept is a means to be practiced in all realms of a designed society; products, environments, programmes and services. A concept relevant in and across all disciplines and even more so in the intersection of disciplines and complex disciplinary challenges.

For more than 150 years, the Bevica Foundation has endeavoured to ensure that persons with disabilities have the same opportunities as everyone else to contribute and be a part of Danish society. We believe in partnerships, collaboration, innovation, research, and knowledge. And we believe that universal design offers an untapped potential in Denmark to design all aspects of our society inclusively for all, and to ensure that as we develop a more sustainable society, we do it in a way that is inclusive for everybody. Regardless of abilities or disabilities.

Hence, in 2020 we established our Interdisciplinary Research Network on Universal Design, with the aim of facilitating the development of an interdisciplinary, research-based knowledge field in Denmark. The 40+ researchers in the network represent 10 research-based universities and institutions in Denmark and are at its heart multidisciplinary. The network meets several times a year, discussing, challenging and developing universal design as a multi- and interdisciplinary concept in the Danish context.

This anthology is a result of this network process. It is the second anthology published by the network, and this one naturally builds upon the first, although they can both be read individually. The first anthology *Universal design – Cross-disciplinary perspectives in theory and practice* discussed universal design as a concept in the Danish context, and this one Universal Design as a Tool for Change, the second, takes the discussion in the natural direction of exploring how to understand and practice universal design as a tool to

create the needed change. This focus of the anthology is also an example of how the research network works; exploring potential themes together and deciding on the final one together.

As with all activities in the network, one rule of the articles was that the author group had to be multidisciplinary. Not all members of the network have contributed as authors, but everyone has participated during the process in workshops, peer review sessions as well as the consistent dialogue in the network that forms the network voice underpinning the publication.

Thank you to the editors, who, as in line with the network spirit, all volunteered to lead the at times big task of securing the anthology and always being true to the interdisciplinary nature of the network itself.

The anthology has been peer reviewed by international universal design experts, a process run by the publisher to secure validity and quality through a blind review process. We are grateful for the constructive and highly relevant review, which emphasizes the importance of the international dialogue within the field of universal design, also in an anthology based in the Danish context.

Thank you also to Kristoffer Weiss and the Danish Architectural Press for welcoming the network and this decisive agenda and for believing in it all the way.

The call to contribute to the necessary change on the journey towards a truly equitable society where everyone is able to participate and contribute, regardless of abilities, is one in need of action as well as knowledge. The need to transfer research-based knowledge into practice and to transfer practice-based knowledge and experiences back to research is decisive. This focus is a consistent pulse of the research network and therefore it has been important to emphasize in this anthology the potential of universal design as an actual tool for change. Seen through different disciplinary lenses and in different disciplinary contexts.

Hopefully, the discussion and attempt to offer knowledge, tools, and interpretations presented in this anthology will be used in practice, research, and teaching. Hopefully, it will be challenged, used, and further developed by the readers. This is our hope. And our invitation.

Camilla Ryhl
Research Director,
Universal Design Hub,
Bevica Foundation

Marianne Kofoed
Director,
Bevica Foundation

Introduction

Universal Design as a Tool for Change: Framing the Conversation

Mia Høj Mathiasson, Thomas Skovgaard Worm,
Leif Hemming Pedersen, Valeria Borsotti, Roberta Cassi

This anthology explores how Universal Design (UD) can serve as a tool for change across diverse societal domains. The field of design *for* and *with* people with disabilities has grown over time, shaped by changing understandings of disability and by new ways of thinking about design. Justice-centred approaches to disability, centering the agency and perspectives of disabled communities, have encouraged a deeper understanding of how people's bodies and minds interact with their surroundings, with designed objects, and with broader organisational and political systems (Hamraie, 2017; Kafer, 2013; Pineda, 2024). These critical and disability-led efforts have developed alongside new conceptualizations and practices of design, pushing beyond its 'traditional' domains – industrial design and architecture – expanding the term to indicate the human capacity for envisioning change, and collaborative ways to enact social innovation from the bottom-up, in many different domains (Manzini, 2015). Over time, these shifts in how we understand both disability and design have influenced the field of UD, opening space for productive conversations and fresh inquiry. In this collection, scholars, practitioners, and disability activists renew this endeavor and reflect on both the challenges and the possibilities of UD as a tool for change.

UD emerged in the mid-1980s as an approach to create "products and environments usable by all people, to the greatest extent possible, without the need for adaptation or specialised design", in the famous words of architect Ron Mace (1985). From its origin in design, architecture, and disability access, UD has evolved into a broader and more strategic perspective for inclusion and positive change. In 2006, the United Nations formally embraced UD in the Convention on the Rights of Persons with Disabilities (CRPD), defining it as the design of products, environments, programmes and services to be usable by everyone (United Nations, 2006). As such, the CRPD defines UD as a multi- and interdisciplinary concept that requires collaboration and knowledge development

across disciplines. With this broader scope, UD acknowledges that human diversity, including physical, sensory, cognitive, cultural and personal differences, must be addressed beyond the built environment, extending into social, educational, and institutional structures and practices. Today, UD is increasingly recognised as a transformative approach to promoting inclusion and supporting broader social change. It has moved beyond the field of design to become part of a wider effort to address barriers in everyday environments and practices.

As disability scholar Aimi Hamraie argues, UD has never been just about technical solutions. It has functioned as "a sustained, understated activist movement" that challenges dominant understandings of disability in design, medicine, and society (Hamraie, 2017). This notion of UD being more than technical solutions has been thoroughly developed by key scholars in the Nordic region over the last 25 years, exemplified by, e.g., Norwegian scholar Inger Marie Lid, Swedish scholar Per-Olof Hedvall and Danish scholar Camilla Ryhl. In their individual work, they have defined a Nordic approach to interpreting and practicing UD, which, early on, moved away from the legislative and technical understanding of UD. Their work points to an ethical, holistic and sensory approach to the potential and context-specific use of UD as a tool to secure equal rights to equitable inclusion. Lid's work points to the ethical aspects of interpretation, human rights and user perspectives, while Hedvall points to tangible practices, strategies and implementation. In her work, Ryhl has documented the diversity of abilities, with a specific emphasis on the sensory aspects of architecture. These scholars are representatives of a larger Nordic community of researchers who, since the 2000s, have facilitated the adoption of UD across the Nordic region (Grangaard, Hedvall, & Lid, 2024; Ryhl, 2024). Specifically, in Denmark, UD has been increasingly adopted since 2020, primarily as an interdisciplinary concept. These developments, together with their timing, offer an opportunity to reflect on how UD is interpreted today and on its potential to support change towards greater, more equitable inclusion. In this spirit, this anthology asks: *What kind of change is at stake in and with Universal Design? How is change initiated, and who is involved in shaping it?*

Vision behind the anthology

We argue that UD is both a practical approach and a creative force for social transformation. Traditionally, UD was often presented in "disability-neutral" terms, marketed as common-sense "good design for everyone," downplaying its roots in disability rights. This idea of UD as a critical and reflective thinking tool has helped distinguish UD from basic accessibility compliance, positioning it as a broader value-neutral design philosophy. However, recent critical perspectives have pushed back against this neutrality, insisting that the experiences and leadership of disabled people must be central to UD's future. Scholars like Hamraie connect UD to broader questions of social justice, stressing that defining "the user" or "everyone" in design is inherently political (Hamraie, 2017). Their work invites us to reorient UD toward disability justice and collective empowerment, rather than treating it as a mere design checklist. With this anthology, we take up that challenge by demonstrating how UD can be approached critically and collaboratively to transform our environments, institutions, cultures, and relationships. In doing so, the volume of chapters presented here all treat social change not as a fixed concept, but as something to be explored and UD as a thinking tool to explore with.

What do we mean by change in the context of UD? Is it about incremental improvements in accessibility, or more fundamental shifts in how society understands human differences, abilities, and design? Different chapters offer different answers, but all share a commitment to UD as a tool for moving towards a more inclusive society.

This understanding of change also informs our notion of a tool: UD is not a static instrument but a flexible, dynamic means for enabling transformation in diverse contexts. We explore how UD can function as a practical framework, a mindset, and a catalyst for rethinking norms and fostering innovation across multiple domains.

Interdisciplinary context and evolving perspectives in UD

This anthology is rooted in a unique research context: the Bevica Foundation's Interdisciplinary Research Network on UD, based in Denmark. The network brings together researchers who share an interest in UD and work within a

wide range of disciplines, including design, architecture, education, sociology, engineering, disability studies, media research, computer science, and more. As a precursor to this anthology, the network published its first anthology in 2024 (Frandsen, Bonfils & Olsen, 2024), thereby establishing a common ground and offering cross-disciplinary perspectives on UD as theory, method, and practice. The 2024 anthology mapped the emerging landscape of interdisciplinary UD research in Denmark and began a conversation across fields. This follow-up volume extends the diversity of perspectives and interdisciplinary approaches. Building on those discussions, as well as subsequent research and projects within and beyond the research network, the current volume moves from the interdisciplinary consolidation to an even further mobilisation of UD's potential for change. It follows UD into sites where change processes are actively facilitated and methods tested. The anthology presents UD's relevance in contexts as varied as social policy, urban mobility, music festivals, digital technology, education, and art, while also interrogating theoretical changes in the UD literature and foregrounding disabled-led *practice* and *activism*. This signals a clear trend: UD is increasingly applied outside its traditional fields and is gaining broader societal importance. Moreover, they reflect the shifting attention from asking *what UD is* to *how UD operates* as a process, mindset, culture and practice within different domains.

Notably, several chapters turn a reflective lens on the research network itself. This meta-perspective, presented in the first section of the anthology, acknowledges that how we collaborate and generate knowledge about UD – how projects are conceived, formulated, and translated across disciplines and carried out into institutions – can be a tool for change in its own right. The Bevica Foundation's Interdisciplinary UD Research Network, alongside its Universal Design Hub, operates not only as a platform for research but as an active driver of *change* – through the creation of new connections, ideas, and support of inclusive innovation. In bringing together academics and practitioners, the network functions as an intermediary that bridges theory and practice, and as a community of change-makers working at multiple levels, from local "niche" projects to broader policy "landscapes". The inclusion of network-focused and self-reflective chapters in Section 1 is therefore highly

intentional, as it makes visible the context from which the anthology has emerged. Moreover, with this section, we wish to encourage reflection on how interdisciplinary collaboration has shaped our work, preparing readers for the more thematic and case-oriented chapters that follow.

Across the chapters, a unifying theme is that UD is undergoing an important evolution: from a primarily rights-based, compliance-oriented framework toward a value-based, creative approach. Early conceptions of UD were closely tied to disability rights and legal standards (e.g., building codes, accessibility laws), asserting the right of people with disabilities to access mainstream environments. While those foundations remain crucial, many authors in this volume argue that UD should also be a way of thinking and innovating that continually questions norms and biases. In this view, UD becomes a tool for creative disruption that not only accommodates diversity but also actively draws on it as a source of design inspiration and social innovation. Here, disability is reframed not as a problem to solve, but as a source for new designs, pedagogies, and policies. Curiosity, reflexivity, and creativity are highlighted as keyways to bring disability and human diversity from the periphery to the very center of research, design, and practice.

As suggested in chapters here, there is rich potential to expand UD both practically, into new fields and disciplines, and conceptually, as a mindset, culture, process, practice, and tool (Hedvall, 2024), fostering inclusivity and social transformation. Throughout the chapters, readers will see how authors draw on different disciplinary traditions and methodologies to explore what this expansion can look like in practice. Some chapters delve into UD's theoretical underpinnings, asking what conceptual assumptions about change and society underpin UD discourse. Others present empirical case studies in which UD principles are put into action and tested in real-world scenarios. We do want to stress, though, that this anthology is not a one-dimensional "how-to" manual, but a collection of intersecting inquiries. Rather than prescribing a single definition of change, the volume invites readers to engage with UD as a dynamic tool for rethinking norms and enabling diverse forms of progress toward more inclusive societies.

Anthology audience

The anthology is aimed at a broad audience of researchers, students, and practitioners interested in UD and in understanding and using it reflectively. With its interdisciplinary scope, the anthology also aims to inspire readers who may not be familiar with UD but work with inclusivity, accessibility, and equity-related projects across a range of fields.

Whether one works in urban planning, education, information technology, healthcare, social science, the cultural sector, or design, the insights presented in this volume are meant to resonate and spur new thinking. To this end, the contributors have strived to use clear, accessible language and to explain concepts in a way that bridges disciplines and professional fields. The anthology will also lend itself to teaching situations, informing students about UD and how to work with it. Finally, the anthology is meant to inform and guide practitioners who are already working with, or want to incorporate, UD in their practices. The chapters represent a variety of fields and disciplines, which we hope will not only inspire interdisciplinary thinking about social transformation but also showcase the potential of interdisciplinary collaboration. Thereby, the anthology hopes to inspire readers to think beyond the silos of their own field when tackling social transformation and change processes.

In line with UD principles, we have given careful thought to the accessibility of this publication itself. The layout, formatting, and distribution ensure the content is usable by as many people as possible. We have considered typography and color contrast for readability, and we encourage sharing and adaptation of the material under an open license. By practicing what we preach, we aim to remove barriers to knowledge and invite a wide audience to participate in the conversation about UD.

Anthology structure and content

The anthology is organized into four thematic sections, followed by a concluding epilogue. After this introductory chapter by the editors, Section 1: A Network for Change provides context on the origin of the anthology and the research network behind it. Section 2: Theoretical Reflections on UD delves into foundational ideas and critical theory, opening new ways of understanding UD's role in social change.

Section 3: UD and Social Change in Practice presents case studies that demonstrate how ideas about inclusive mindsets are put into practice in real-world settings. Finally, Section 4: Future Perspectives challenges conventional approaches by centering the creative agency of disabled individuals and pointing towards future directions for UD. The anthology concludes with an epilogue by the editors that summarizes insights and highlights promising future directions for the use of Universal Design for creating meaningful change. In the following, we outline the different sections in terms of their focus and scope.

Section 1: A Network for Change

Section 1 introduces the Bevica Foundation Interdisciplinary Research Network, which forms the foundation of this anthology. It shows how building a research network and fostering interdisciplinary collaboration can itself serve as a tool for social change, advancing the understanding and application of Universal Design (UD) in Denmark. The chapters in this section provide transparency about the origins of the anthology, offer reflections on the first years of the network, and explore how collective efforts contribute to developing UD as both a research focus and a practical approach to inclusion.

Chapter 1 Universal Design as a Tool for Change: A Conversation with Camilla Ryhl (Camilla Ryhl & René Sørensen Overby) reflects on the network's first four years in a structured dialogue with the Research Director of the Bevica Foundation. The conversation addresses UD as a tool for societal change, the ambitions and challenges of building the first Danish interdisciplinary UD research network, and visions for how such collaborations can contribute to future inclusion-oriented initiatives.

Chapter 2 A Network for Universal Design: Perspectives from Denmark (Barbara Nino Carreras, Turid Borgestrand Øien & Mia Høj Mathiasson) introduces the network and its members, mapping how UD is applied in research and teaching across diverse disciplines. Using concepts from change theory, the authors frame the Bevica Foundation, the UD Hub, and the research network as intermediaries and tools for social transformation at different levels of society.

Research in Denmark (Anne Kathrine Frandsen, Turid Borgestrand Øien, Masashi Kajita & Eva Brandt) takes a closer look at 16 research projects within the network. Through surveys and a collaborative mapping workshop, the chapter identifies the research fields, aims, and methods represented, highlighting the interdisciplinary and transdisciplinary growth of UD research in Denmark and the shared ambition to improve everyday life through inclusive solutions.

Section 2: Theoretical Reflections on Universal Design

Section 2 focuses on the theoretical foundations of UD and how ideas of social change are embedded within its evolving discourse. While UD is widely used in architecture, design, and policy, its theoretical underpinnings often remain implicit. These chapters critically examine historical developments and philosophical assumptions, offering insights that can strengthen both research and practice.

Chapter 4 Foundational Assumptions of Universal Design: Locating Ideas of Social Change in Three Key Texts (Leif Hemming Pedersen, Emil Ballegaard, Emil Søbjerg Falster & Ole B. Jensen) analyses three key texts from different periods of UD to uncover their assumptions about users, knowledge, and the nature of change. The chapter shows how these differences influence whether UD is understood as a technical solution, a social strategy, or a political project.

Chapter 5 Universal Design: A Shift from or an Extension of Functionalism? (Christine Bjerke & Emil Søbjerg Falster) examines the legacy of Functionalism in Danish design and architecture education and considers how UD both departs from and sometimes reproduces aspects of that tradition. By reflecting on this historical connection, the chapter highlights the importance of critical reflexivity to ensure that UD genuinely supports diverse human bodies and experiences.

Section 3: Universal Design and Social Change in Practice

Section 3 presents practice-oriented case studies that demonstrate how UD can operate as a tool for social change in educational and participatory contexts. Both chapters explore how fostering inclusive mindsets can shape design processes and outcomes.

Chapter 6 Inclusive Mindsets as a Tool for Change: Advancing Universal Design (Akrimar Tongkaew, John Paulin Hansen & Dagný Valgeirsdóttir) introduces the Inclusive Mindset Model, which identifies awareness, motivation, attitude, and understanding as key elements that lead to inclusive behavior. The chapter demonstrates how cultivating such mindsets can help translate UD principles into practical and systemic change.

Chapter 7 Leveraging Music Festivals to Nurture Inclusive Mindsets in Design Education (Ole B. Jensen, John Paulin Hansen & Dagný Valgeirsdóttir) uses the Roskilde Festival as a "living laboratory" for UD. Students develop inclusive solutions in a temporary urban environment, bridging theory and practice through hands-on experimentation and co-creation with diverse users.

Section 4: Future Perspectives

The final section looks to the future of UD by centering the creative agency and lived experiences of disabled individuals. These chapters challenge conventional approaches and show how UD can evolve into a tool shaped by participation, justice, and cultural change.

Chapter 8 Reframing Disability in Universal Design: Critical and Creative Practices Beyond Traditional Approaches (Roberta Cassi, Barbara Nino Carreras, Valeria Borsotti & Masashi Kajita) highlights disabled-led design, artistic practices, and collaborative initiatives that treat disability as a source of knowledge and innovation. Drawing on concepts such as crip technoscience, the chapter illustrates how UD can expand beyond accommodation toward participatory, creative, and socially engaged design.

Chapter 9 Body Activism, Disability Visibility and Universal Design: Reimagining New Approaches with Cath Borch Jensen (Valeria Borsotti, Mia Høj Mathiasson & Cath Borch Jensen) presents a conversation with a Danish body activist whose integrated dance and digital storytelling challenge stigma and open new ways of thinking about UD. The chapter shows how activism and lived experience can inform a justice-oriented, participatory approach to inclusive design.

Section 1 A Network for Change

The first part of the book maps the current landscape of universal design research in Denmark and highlights the role of the research network as a driver of change in the field.

The anthology starts with a conversation with Camilla Ryhl, Research Director of the Bevica Foundation, who reflects on the first four years of activity of the Bevica Foundation's Interdisciplinary Research Network, and discusses the challenges and potentials of building an interdisciplinary community of researchers in the field of universal design.

Chapter 2 looks at how the Bevica Foundation's Interdisciplinary Research Network and the Universal Design Hub act as change agents and intermediaries actively working for social change. It also presents an overview of the research network and its members across a range of different disciplines.

Chapter 3 offers a collective mapping and cross-analysis of UD projects undertaken by the members of the Bevica Foundation Interdisciplinary Research Network, and explores the research fields, aims and methods across the members. Here we also look at the practical lessons that can be drawn from this work, and discuss some of the challenges in making more inclusive everyday living a reality.

Chapter 1

Universal Design as a Tool for Change: A Conversation with Camilla Ryhl, Research Director at the Bevica Foundation

Camilla Ryhl, René Sørensen Overby

If we lose sight of the concept's origins, its intention as an invitation to acknowledge disability and impairment as an intrinsic part of human life, we risk losing its potential to transform our understanding of the body, diversity, disability, and ability. This transformative potential lies at the very heart of universal design.

Introduction

This chapter examines the establishment and development of Denmark's first interdisciplinary research network on Universal Design (UD) and its potential as a societal changemaker. It explores the motivations behind creating the network and reflects on how research-based knowledge on universal design can address societal challenges and contribute to a more inclusive and sustainable future.

In recent years, universal design has gained increasing political and societal attention in Denmark, driven by new understandings of inclusion and human diversity and by the increasing need to solve the disability exclusion crisis. This shift challenges research to broaden its approaches and practices, to reimagine inclusive structures. The ambition is to create environments and systems that embrace diversity and enable participation for all.

International commitments such as the UN Convention on the Rights of Persons with Disabilities (CRPD) and the Sustainable Development Goals (SDGs) reinforce this direction. Both stress the principle of Leaving No One Behind. The CRPD defines universal design as '[...] the design of products, environments, programmes, and services usable by all people, to the greatest extent possible, without the need for adaptation or specialised design – while not excluding assistive technologies where necessary'. As a UN member state, Denmark is committed to implementing universal design in legislation, education, and research, and to developing the concept in relation to everyday life.

As a strategic response to this commitment, the Bevica Foundation has initiated an interdisciplinary research network anchored in research and education. The purpose of the research network is to strengthen knowledge of universal design across sectors and disciplines. Members include researchers from universities, schools of architecture and design, and university colleges. Despite different disciplinary perspectives, all members share a common interest in exploring the potential of universal design.

Universal design offers a framework for addressing complex societal challenges by promoting environments that support equitable participation. Recognising that all humans experience shifting abilities throughout life, universal design challenges the notion of a "standard body" and supports more realistic understandings of human variation.

The network promotes this shift through critical reflection and dialogue. Members contribute both within their own fields and across disciplinary boundaries, fostering collaboration and knowledge exchange that broaden perspectives and encourage the co-creation of new understandings of universal design.

Through this collaboration, researchers explore how universal design can inspire new societal and organisational models that accommodate diverse needs, moving beyond the binary of disabled and non-disabled. In this way, the network acts as a catalyst for transforming societal structures and embedding inclusive principles at all levels.

To examine its role and potential as a changemaker, the network has developed an interview guide for this particular conversation with key questions that enable members to reflect critically on their shared work. This self-reflective and exploratory approach is central to expanding what universal design can mean – and how it can be mobilised as a tool for change.

To bring these aims into sharper focus, the following section presents a conversation with Camilla Ryhl, Research Director at the Bevica Foundation. The conversation offers insight into the foundation's historical background, its strategic emphasis on universal design, and its motivation

for initiating an interdisciplinary research network. In this way, the section connects the broader aspirations of universal design with the concrete work of facilitating a research network to advance them.

René

As Research Director at the Bevica Foundation, could you tell us a little about the foundation?

Camilla

Yes, with pleasure. The Bevica Foundation is more than 150 years old and has consistently worked to promote equal opportunities and participation for persons with disabilities, particularly persons with physical impairments. Over the years, the foundation has had a significant impact on Danish society and the development of welfare services and systems.

Our current strategy places a strong emphasis on education and knowledge as the means of advancing our mission: to ensure that persons with disabilities can participate in society on equal terms with everyone else. Within this framework, we regard universal design as a key strategic tool for realising these ambitions.

René

Universal design – could you tell us a little about the concept?

Camilla

At its core, universal design represents a view of humanity that recognises that living with different and changing abilities throughout life is a shared human experience. In other words, living with diverse bodies and abilities is something we all share – it is universal. The term was coined in the 1980s by American architect, lecturer, and wheelchair user Ron Mace, whose vision was to create environments that integrate human diversity in equal and dignified manners.

Universal design does not divide persons into "us and them" – those with and without disabilities. Instead, it embraces and recognises diversity in abilities as a shared human reality. This also means that when working with universal design, one avoids designing 'special solutions for a special user group' but rather accommodates differences in abilities in the main solution. Sometimes this can be done with one solution, but most often the answer is a catalogue of solutions that together form the universal design solution.[1)]

1) Ryhl, C. (2024) Universal Design in Architecture – on enabling and empowering a diverse population, Danish Architectural Press, Copenhagen.

This means that when we work with the frameworks of everyday life, it is this understanding of human diversity that guides our efforts. Whether approached as a value, a process, or a tool, universal design seeks to achieve solutions that are usable by as wide a range of persons as possible. This approach is reinforced in the UN Convention on the Rights of Persons with Disabilities (CRPD), which states: "Universal design" means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised. [2)]

The CRPD expands the understanding of universal design from being limited to the design of products and environments, as it was originally framed, to also include programmes and services. This definition in the CRPD emphasizes the need to understand and practice universal design as both a multidisciplinary and interdisciplinary concept, as it is relevant to use in all aspects of a designed society and a lived life.

As a UN member state having ratified the CRPD in 2009, Denmark is obliged to promote research and development of universally designed goods, services, equipment, and facilities, as well as the development of universally designed standards and guidelines. [3)]

2) UNCRPD, article 2: *ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities.*

René

In 2020, the Bevica Foundation established the Universal Design Hub. Could you explain the thinking behind that decision?

Camilla

Yes. You could say that setting up the Universal Design Hub marked a strategic step in establishing a knowledge hub on universal design. To strengthen our focus on education and research-based knowledge about universal design, particularly universal design as an interdisciplinary concept, as defined by the CRPD. The initiative was founded on the conviction that knowledge and education are essential building blocks in advancing equal inclusion for persons with disabilities in Denmark.

3) UNCRPD, article 4 (f): *ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities.*

René

Later that same year, the Bevica Foundation launched an interdisciplinary research network. What were the ideas and ambitions behind it?

Camilla

We saw the Interdisciplinary Research Network on Universal Design as a concrete tool for change. The Bevica Foundation's work to strengthen inclusion for persons with disabilities is firmly rooted in research-based knowledge, and the ambition was to support the development of a new field of interdisciplinary knowledge on universal design in Denmark, which at the time was lacking. The network was conceived as a space where research-based knowledge could be generated, shared, and further developed – knowledge that could help reshape societal structures so that, in the future, society is better able to embrace human diversity.

In other words, we believe that by embedding knowledge about disability, inclusion, and universal design into research and education in Denmark, we will, over time, strengthen efforts towards equal inclusion across society.

René

The network develops new knowledge on universal design both within individual disciplines and across them. Why is that?

Camilla

Our experience was that researchers in Denmark were often working in disciplinary silos, frequently isolated or part of very small research environments, and often unaware of each other's work. We therefore wanted to bring them together and establish an interdisciplinary field of knowledge to complement the existing mono-disciplinary research.

This choice reflects why the Bevica Foundation takes an interdisciplinary perspective on universal design. Universal design is embedded in the UN Convention on the Rights of Persons with Disabilities (CRPD) precisely as an interdisciplinary concept. The CRPD defines it as "the design of products, environments, programmes and services (...)." The CRPD's definition underscores that inclusion is relevant across all sectors and all disciplines. This is a perspective that lies at the very heart of the research network.

We all live our lives across these different sectors every day. So, the challenges are often by their very nature interdisciplinary and must therefore also be addressed in that way. At the Bevica Foundation, we base our work on the CRPD's

definition of universal design, and therefore, we also understand the concept as interdisciplinary. Moreover, the Bevica Foundation has always worked across all the frameworks of everyday life, so our work is interdisciplinary by nature.

René

How does the research network translate that knowledge into change? In other words, how does it act as an agent for change?

Camilla

Yes, that is a brilliant question. You could say that the ambition of the research network as a change agent is that, within the interdisciplinary space where diverse forms and levels of knowledge intersect, new transformative insights can emerge. Interdisciplinarity itself has the potential to shape change – determining which issues we identify, how we approach them, and the kind of knowledge we generate.

Additionally, all network members are affiliated with research and educational institutions. This means that the knowledge, insights, and interdisciplinary networks developed within the research network can be brought back into their own research and teaching, further amplifying its transformative potential.

René

If one were to take a critical view, how do you avoid the knowledge created in the research network simply circulating within the academic or research sphere? How does the research network actually bring about change in society at large?

Camilla

Well, that is, of course, a very important question. We believe that society also changes through knowledge and education. When the knowledge generated in the research network flows back into the educational system, it will, in the long-term, transform society. Because in education, we are training the future actors of society.

In addition, the Bevica Foundation works in a practice-oriented way, and the knowledge created in the network flows into our many different strategic partnerships with practitioners. So, in the foundation's work, there is always a flow of knowledge generated in the research network out into practice on many levels.

Furthermore, the Bevica Foundation works extensively to create and participate in public debates and conversations. So, the knowledge produced in the research network is continuously brought into debates and discussions. In that sense, knowledge is made available to a large part of society.

René

You have mentioned the UN Convention on the Rights of Persons with Disabilities. What other major agendas are relevant in relation to the work on universal design in the research network?

Camilla

There are several. When establishing the Universal Design Hub and the interdisciplinary research network, we were guided by the sustainable development agenda and the commitment of the UN Sustainable Development Goals (SDG) to "Leave No One Behind" (LNOB). LNOB aligns closely with both the CRPD and the Bevica Foundation's broader mission. In this way, sustainable development provides a socially relevant framework into which universal design naturally fits. Importantly, the network seeks to embed disability and inclusion not as a separate concern, but across all major societal agendas, reflecting its potential for systemic change.

René

You have worked with universal design for many years. Would you say that the current attention to discrimination, equality, and diversity makes it easier to bring universal design into the conversation about societal change?

Camilla

Yes, and I do think that timing matters a great deal in terms of how change can happen. I certainly find that the public debate we are having around diversity and inclusion is as necessary as it is a decisive lever for bringing the disability exclusion crisis into the public realm. Hence, it is also an obvious platform for introducing universal design as a means to secure equitable disability inclusion across all other identity markers.

We are shifting in our fundamental understanding of diversity, identity, and difference. What does diversity mean for who we are as a society, as a community made up of many different identities? I think the much-needed current

focus on diversity – which is changing language, practice, and behaviour – is a natural opportunity also to talk about diversity in bodies, and thereby also about universal design. I also believe that the current emergence, both in research and in society, of concepts such as Belonging, Ableism, Disability Justice, and Crip Theory are decisive reflections of a necessary change in language and discourse, and that universal design again offers a means to increase this process as well as the impact of these agendas.

The same goes for the sustainability agenda, which is more urgent every day. But when we speak about sustainability, we must also ask: who is being included in sustainable development, and who is not? Who are we leaving behind? The same applies to the diversity agenda: when we talk about diversity, who exactly are we talking about?

René

Does universal design help turn perspectives upside down – does it frame human diversity as a potential?

Camilla

I believe that, if used thoughtfully and true to the original intention, universal design can fundamentally shift how we understand ourselves and others, particularly in terms of bodily diversity within broader debates on human variation. However, achieving this requires careful and appropriate application of the concept.

René

You've highlighted that the research network is interdisciplinary, working both within and across disciplines. Why is interdisciplinarity so important for driving change?

Camilla

There are several reasons. Mono-disciplinary research environments on universal design already exist in Denmark, and these are growing. The purpose of the interdisciplinary network, therefore, is to complement these existing spaces, to bring researchers together and advance universal design as an inherently interdisciplinary concept.

After nearly five years with the network, one clear lesson is that fostering knowledge-sharing across disciplines requires time, patience, and generosity. Researchers continually deepen their understanding of their own discipline,

its language, and methodology, while also recognising their own possibilities and limitations. Simultaneously, they learn where disciplines intersect and where tensions arise. Building trust is essential before open – and sometimes challenging – dialogue can occur. Only then can interdisciplinarity emerge, generating new insights and knowledge.

René

You've linked universal design to the UN Convention on the Rights of Persons with Disabilities. How is the concept understood in relation to disability, and within the Bevica Foundation?

Camilla

Within the Bevica Foundation and the Universal Design Hub, we approach universal design in line with Ron Mace's original vision, alongside the CRPD's definition, which closely mirrors Mace's ideas. In both frameworks, universal design is first and foremost a perspective on human beings – one that recognises that living with diverse and changing abilities is something we all share.

The original aim of universal design was to establish a concept that recognises there is no "them and us" in relation to disability or impairment. Designing a society that ensures equal inclusion and participation for all requires that design itself actively includes, welcomes, and enable everyone to participate.

As such, universal design avoids creating specialised solutions for specific user groups. Instead, it seeks to address the widest possible range of user needs, striving wherever possible to deliver a single inclusive solution – or a combination of equally inclusive solutions. What I call a catalogue of solutions that together create the universal design solution.

René

If we think of universal design as a tool, who can use it?

Camilla

It is relevant to anyone developing a product, environment, programme, or service. In fact, there are hardly any professional groups for whom universal design would not apply. And it can be applied differently in all design/decision-making processes, as a core value, as a process tool, or as a tangible solution.

René

We have discussed the potential of universal design – but what limitations does it have?

Camilla

The most common limitation stems from linguistic misunderstandings. Many assume that universal design implies a single solution that fits everyone, which often leads to a natural scepticism, as it is misinterpreted as representing the lowest common denominator.

When Mace coined the term "universal", he did not mean "one solution for all" but rather "what we share in common". In the Danish context, the key challenge is often the communication of this rather than the concept itself.

Another challenge is that the concept's value lies in recognising that there is no "them and us" regarding bodily diversity and ability and not merely recognising it but emphasizing that all of us experience varying abilities throughout life. This creates a risk: disability and impairment may be downplayed if the concept is applied superficially.

If we lose sight of the concept's origins, its intention as an invitation to acknowledge disability and impairment as an intrinsic part of human life, we risk losing its potential to transform our understanding of the body, diversity, disability, and ability. This transformative potential lies at the very heart of universal design.

René

So universal design relates to bodily diversity, but how does it intersect with other identity markers? How should we understand it in relation to intersectionality?

Camilla

Universal design primarily concerns the identity marker of ability/disability, whether physical, sensory, cognitive, or neurodivergent.

Yet ability and the body intersect with other markers. For instance, ability/disability remains relevant when combined with ethnicity, sexuality, gender, or religion. Intersectionality examines how different identity markers interact, and few individuals identify with only one.

Since universal design embraces the diversity inherent in ability, it is relevant within the intersectional framework. However, it is crucial to remember that universal design is fundamentally about bodily diversity in abilities. If we discuss it solely in terms of gender, for example, without considering bodily variation, we miss the concept's essential contribution.

This is significant because we have lacked a concept capable of guiding the design of a society that genuinely includes the full spectrum of ability/disability on equal terms.

René

So is the goal of universal design that, in time, simply becomes "design"? That design in itself is so inclusive or accommodating that one no longer needs to call it universal design – it is just design?

Camilla

I would describe that as an ideal rather than a goal. The goal of universal design is to ensure equal inclusion for all, regardless of ability. It seeks to challenge our individual and collective understanding of what it means to be human, offering a kind of repositioning or renewed approach to designing society grounded in a broader understanding of humanity.

René

We have discussed working with universal design across society. What about health and well-being? How can it serve as a tool for change in that sector?

Camilla

It is relevant across multiple aspects – from digital and analogue communication with patients or between professionals, to the physical environment, to the design of treatments themselves, whether digital or physical. It could apply to surveys, appointment letters, scheduling, consultations, knowledge-sharing, or access to medical records. In this way, universal design can function as a quality benchmark throughout the health sector.

René

So, could it even help strengthen digital infrastructure in healthcare?

Camilla

Yes. There are already concrete universal design tools and methods – the seven principles, the eight goals of universal

design, and other researcher- and practitioner-developed tools. A universal design process can be applied across programmes and services in healthcare, increasing accessibility. This includes digital services, whether completing an online survey, receiving a digital appointment notification, or attending a virtual medical consultation. And as such, Health and Wellbeing serve as an example of how universal design can be relevant across all aspects and processes of any sector.

René

We've discussed healthcare as an example also, so does the same apply to politics and legislation? Can universal design drive policy and law towards greater inclusivity?

Camilla

Absolutely. Viewed as both value-based and process-oriented, universal design shapes legislation and reflects the underlying conception of humanity. The key question becomes: how do we ensure that laws account for the diversity of citizens' abilities? In other words, what understanding of humanity underpins our legislation?

René

Yes, in relation to social legislation in Denmark, there is a principle of compensation – providing compensation for a particular group of persons. Whereas within building legislation, and particularly the building regulations (where universal design was introduced in 2018), the aim is to avoid special compensatory solutions and instead work towards inclusive architecture – where everybody is considered from the outset.

Camilla

Well, again, universal design, in relation to the building regulations, would first and foremost represent a more realistic and holistic understanding of what it means to be human, and of who the users that you are designing for in reality are. In other words, who do we imagine will actually use the buildings that the building regulations cover? It also invites a process-oriented approach to regulation, which could produce a different kind of legislation altogether, ensuring that all users are considered equitably in every aspect of legislation, and also in this case, in the building regulations.

René

Do you think that stricter building codes and legislation is the answer to achieving more inclusive architecture?

Camilla

The current evidence does not suggest so. I believe that if building regulations – or indeed any legislation – were approached from a foundation of universal design as a core value, then over time we would create a society, including a built environment, that is far more equally inclusive.

But this also requires knowledge. Simply tightening requirements in the building code will not, in itself produce more inclusive architecture. That is precisely why interdisciplinarity is central to our research network. You can strengthen the code, but if educational provision does not equip future professionals, or if workplaces fail to support flexibility and equity, then regulation alone cannot secure inclusion. These are interdisciplinary, highly complex challenges, requiring the generation of new knowledge across fields.

René

What strategic considerations inform the research network's communication of universal design? In other words, how does the Bevica Foundation approach the dissemination of research-based knowledge?

Camilla

Several considerations guide us. First, we aim for researchers in the network to contribute to societal debates and public conversations, as well as to our strategic partnerships, so that the gap between research and practice is kept as narrow as possible. And the mutual information of research-based and practice-based knowledge is facilitated and developed. For example, through our partnership with Folkemødet – Denmark's annual democracy festival – research not only informs the design and organisation of the event, but network members also participate actively in the debates taking place there.

Beyond this outward-facing communication, we have also considered how the network communicates inwardly within academia. The long-term ambition is to help establish a research field in universal design across disciplines, which requires dialogue, critique, and further development in the academic community.

To support this, we facilitate opportunities for researchers to publish both in popular science formats and in peer-reviewed journals and anthologies. Within the anthology framework, we can set our own requirements – ensuring, for instance, that each article involves knowledge development and dialogue across disciplines. The result is a written dissemination that speaks both to the academic world and to practice.

René

And does the anthology explicitly encourage interdisciplinary collaboration?

Camilla

Exactly. We require contributors to co-author with network colleagues from other disciplines and to develop genuinely new knowledge together. Rather than merely describing completed projects, we encourage them to write around shared themes and problems, bringing diverse disciplinary perspectives into dialogue.

René

Why is it important to develop and disseminate research-based knowledge on universal design?

Camilla

At the Bevica Foundation, our work is grounded in research-based knowledge. In doing so, we complement other organisations and user bodies that represent practice-based, lived experiences or experiential knowledge. Our strategic choice has been to support and facilitate the development of interdisciplinary, research-based knowledge.

René

So, the idea is that, when universal design is to be put into practice, there is a research-based foundation to draw on? And following from that: how can you ensure that the knowledge developed within the Research Network is also transferable to practice?

Camilla

The task of the Universal Design Hub is to facilitate the development of research within the network and to make that research available to education, practice, and other relevant actors. We cannot guarantee that research will translate directly into a particular practice. By insisting on interdisciplinarity within the Research Network, we include a wide span of disciplines – and with that, a diversity

of methodological approaches and research traditions. That breadth is crucial to us, but it also means that some researchers will work in ways that are more practice-oriented than others.

René

Earlier, you mentioned that researchers also contribute to public debates, citing Folkemødet[4] as an example. But what is the relationship – or perhaps the tension – between advocating for universal design and conducting research on universal design? Are there contradictions or challenges?

Camilla

I would not say there are inherent contradictions, but they are certainly two distinct endeavours. It is important not to collapse them into one. Whether an individual also chooses to act as an advocate for universal design is, in my view, a personal decision – and it should remain so.

Alongside the question of advocacy versus research, I would add that members of the Research Network are encouraged to be critical, skeptical, and questioning of the concept itself. Universal design does not need to be one's primary research field in order to participate. But the constant focal point of the network is universal design.

René

There seems to be considerable interest in the Research Network, particularly in its interdisciplinary nature. With 40 members already, do you envisage the network expanding into a Nordic or even a global network?

Camilla

Yes, I do. From my experience, there is strong international interest, curiosity, and recognition that we have established something unique, an interdisciplinary research network centred on universal design. That is very encouraging.

One could certainly imagine the development of both Nordic and global networks, or a network of networks, at multiple levels. That is my hope. The enthusiasm, commitment, and professional engagement we encounter internationally suggest that similar networks will emerge elsewhere, inspired in part by what we have created.

4) Folkemødet is an annual event that attracts thousands of participants; politicians, experts, organizations and citizens. The 3-day program includes a wide range of events, ranging from panel debates and lectures to workshops and interactive discussions.

At the same time, the Bevica Foundation is rooted in Denmark. Our role is therefore to inspire, contribute, and actively participate in broader collaborations, while recognising that the strength of our network also lies in its Danish context. It is firmly embedded in Danish conditions while drawing on international knowledge and experience.

René

And this is also why you invite experts and researchers from other international environments to participate and share their knowledge?

Camilla

Absolutely. It is vital that the network does not become insular or rely exclusively on Danish knowledge.

The research is conducted within a Danish context, which in many ways – politically, culturally, and conceptually – exists in its own specific reality. But it is essential to remain in dialogue with international knowledge environments and to be informed by international development and agendas. That is why we invite international experts into the Research Network, for example, to lead masterclasses with members. In this way, the network benefits from close dialogue while continually being exposed to new perspectives and different kinds of knowledge. Knowledge that challenges both the network itself and the Bevica Foundation's own understanding. It is vital, I believe, that we remain in constant dialogue with the international knowledge field.

René

What do you see as the future of the Research Network? How might it look in ten years' time?

Camilla

I expect it to be strong, thriving, and firmly established. Many of those who are now early in their careers will, I hope, stay connected – having introduced their own PhD students or colleagues into the network. In that sense, I believe it will become an important environment for emerging researchers: a place where they can explore what universal design might mean within their own academic careers.

At the same time, I hope it will remain a forum that more experienced scholars use as a free and trust-based space for

exchange. Because it is a knowledge-sharing network, not a competition for resources, the diversity of disciplines and backgrounds creates a setting where inspiration flourishes, and where interdisciplinarity ensures that no question is off-limits.

The essential quality is openness – and intellectual curiosity about the potential of universal design as a concept. That openness is vital to the Research Network and central to our ambition of fostering change through universal design as a tool.

It is not as though, in ten years, universal design will have become redundant. On the contrary, the concept will continue to evolve, to be challenged and redefined in new contexts.

René

So, will the Research Network still be relevant ten years from now?

Camilla

Absolutely. I am convinced of that. By then, I expect the network will be more widely recognised within academia and better established, while still retaining a dynamic flow of new members. Indeed, the need may be even greater, as changes within education increase the demand for knowledge in this field. For that reason, the Research Network will only grow in importance. I believe universal design will no longer be seen as a niche concern but as a more widely recognised concept, encountered across many parts of society. And hopefully, by that, it will also be an implicit aspect of interdisciplinary knowledge development addressing imminent and key challenges in our society. A complex, nuanced, and reality-based interdisciplinary investigation, which is also reflected in the different chapters in this anthology, as it is in the questions posed by the network members, which we have just discussed in this conversation.

As I often say, universal design insists that 'diversity in abilities requires diversity in solutions', and in our research network, we insist that complexity in disability exclusion barriers requires interdisciplinary and new universal design knowledge. A task that requires a platform like the Interdisciplinary Universal Design Research Network on Universal Design.

Chapter 2

A Network for Universal Design: Perspectives from Denmark

Mia H. Mathiasson, Turid B. Øien, Barbara N. Carreras

Introduction

Social change is a common goal for many researchers and practitioners working within inclusion and Universal Design (UD). In Denmark, the Bevica Foundation and its UD Hub are actively aiming to foster socially inclusive change through UD. Bevica's Interdisciplinary Research Network represents both the practical application of and aspiration for UD across diverse fields of practice. Before we explore the motivations and perspectives for change, as well as the breadth and potential impact of the network, we will start out with a brief overview of the theoretical foundations. In what follows we begin with a contextualisation of UD as a framework that has travelled to Scandinavia and Denmark, and the work and agenda of the Bevica Foundation and its UD Hub as an actor supporting the dissemination and implementation of UD across different sectors and academic fields.

Universal Design in Scandinavia

Universal design (UD) is a value-based concept that challenges reductive views of humanity and disability by recognising the diverse ways in which people experience and relate to one another and their socio-material environments. As opposed to 'special designs' for people with disabilities, UD was introduced in the US in the 1980s as "a way of designing a building or facility at little or no extra cost so it is both attractive and functional for all people, disabled or not" (Mace 1985). Subsequently, UD travelled to Europe by the end of the millennium as 'Design for All' (EIDD 2004) and 'Inclusive Design' (Clarkson & Coleman 2015) and was further implemented in a global framework by the United Nations Convention on the Rights of Persons with Disabilities (CRPD) in 2006. In the Scandinavian countries, following the ratification of the CRPD in Sweden in 2008, Denmark in 2009, and Norway in 2013, all three countries acknowledge UD processes and products. UD has been a focal theme for projects and initiatives under the Nordic Welfare Centre since 2018 (Nordic Welfare 2024), and all three countries have been part of mobilising and running

the International Conference on Universal Design from 2012 onward. Yet the uptake of UD in national policies across Scandinavia differs. The different policies can be described as: a Norwegian top-down implementation, a Danish pending position for other sectors to adopt the concept (bottom-up), and a Swedish combined top-down and bottom-up approach (Grangaard, Hedvall & Lid 2024). In its Building Acts, Norway has delimited UD to physical and technical environments. In Sweden, policies other than the Building Act have implemented UD in versions that are more aligned with the CRPD's version and UD is used as a guiding principle in combination with accessibility and usability (ibid.). Danish governmental acts have been minimal, not defining or referring to UD but indirectly supporting a more open and dynamic understanding and use of UD in planning and design practices. Consequently, during recent years, UD has been implemented and interpreted in different Danish sectors and disciplines, e.g., as a lever for the UN Sustainable Development Goals. Efforts to implement UD across different areas of society have been possible through the advocacy labour of human rights organisations, policymakers, interest groups, and academics. As such, UD has slowly become an important concept to influence design practices across different sectors in Scandinavia.

Delving into Mace's reformation of architectural practices through theorising human diversity in design, Hamraie (2017) recognised that knowledge of UD was materialised as *epistemic activism:* Interventions by privileged groups in privileged sites of knowledge production, such as academic contexts and policymaking, to impact societal change through co-creation with marginalised communities who have historically been peripheral or neglected as experts in decision-making processes. Over the past decade, the implementation of UD in policymaking has become a new site where epistemic activism is remaking and challenging design practices and exclusionary understandings of bodies, minds, and design. In Denmark, such practices are reforming the exclusionary and oppressive policies and practices still present in our welfare systems and design practices (Hansen, 1996; Falster 2024). Moreover, framing UD as a means for a paradigm change in the way we understand 'ability' and 'disability' (Frandsen, Bonfils & Olsen 2024), fostering equal

experiences and opportunities for participation in society beyond architecture and design in education, healthcare, urban space, transport, cultural life etc. As these humanistic goals and values are highly situated in specific social and political contexts, we have accordingly focused on how UD has been implemented and adapted to the Danish context by studying the Interdisciplinary Research Network in Denmark.

Bevica and the UD Research Network

The Bevica Foundation is a 150-year philanthropic foundation "working for autonomy and independence for individuals with mobility impairments" (Bevica Fonden 2025). With the aim of strengthening the field of UD as a research-based field of knowledge in Denmark, Bevica established the Universal Design Hub (UD Hub) in 2020, along with an affiliated Interdisciplinary Research Network that gathers scholars across Denmark dedicated to the study of accessibility, disability, social inclusion, and UD. Based on its understanding of UD as a means of addressing complex challenges that span across different frameworks of social inclusion, Bevica has supported the interdisciplinary and cross-sectoral efforts towards a holistic understanding of human diversity and ability.

Initially, the research network was established based on the research and expertise of eleven senior researchers, subsequently extended to include PhD and postdoctoral researchers, to secure a long-term research environment around UD. Five full-time employees at the UD Hub facilitate communication between the network through articles, social media activities, and support for participation in public debates and relevant events (Bevica Fonden 2025). The focus on change and transformative processes within academia and research is central for understanding and discussing the possible impact of the UD Hub and the UD Research Network.

The Interdisciplinary Research Network

The network represents various research positions – from early-career researchers (ECRs), such as PhD students, postdoctoral researchers, and assistant professors, to docents, senior researchers, associate professors or lecturers, and professors. The different positions of the 38 active network members are listed in the table below. → Table 1

The members are based in Danish research institutions – universities, university colleges, art schools – with backgrounds in architecture (including landscape architecture), design (including lighting design), sociology, psychology, audiology, public health, ethnology, philosophy, media studies, social work, anthropology, political science, law, economy, library and information science, communication and IT, engineering, sports science, public administration, pedagogy, organisational studies, and visual culture. Through dialogue and discussion, the network supports and promotes an attitude-changing process, where societal understandings of normalcy are challenged towards social inclusion and equity, addressing questions of access, disability, inclusive design, and policies. The network members are associated with research-based educational institutions and represent different universities, schools of architecture and design, and vocational colleges. The researchers work with UD or similar concepts, such as inclusion, diversity, and accessibility, in their research and teaching and engage in developing the research field, both in their field of expertise, in interdisciplinary research and in their academic institutions.

Method

The aim of this chapter is to understand Bevica and the UD Hub as change agents and the Research Network as a forum for collaboration and knowledge creation around UD. The chapter is empirically driven, building on a deductive analysis of the results of a survey study shared with the network members. The survey examined the role of organisational change, defined as the proactive or reactive change processes initiated by members within an organisation (Battilana & Casciaro 2012). The survey asked the network members to reflect on how their research could generate change towards diversity, equity, inclusion, accessibility, and belonging (DEIA+B), and on the potential use of UD to reach this goal. The network members were asked to identify empirical examples of incentives and barriers to organisational change related to DEIA+B within their fields of research. The online survey was sent to the members of the research network in the Autumn of 2024 and received 16 respondents, including the authors of this chapter.

Research positions of network members	
PhD student	11
Postdoc	6
Docent	2
Senior researcher	3
Assistant professor	6
Associate professor / Lecturer	3
Professor	5

Table 1 Distribution of the research positions of the network members (n=38) as of October 2024.

Survey questions

1. What do you wish to change with your research?
   - → What is the problem(s) you want to solve?
   - → What level(s) of change is needed to solve the problem(s)?

2. How could your research generate (organisational) change towards diversity, equity, inclusion, accessibility, and belonging (DEIA+B)? Try to think of a concrete example and describe it.
   - → Thinking on the example you provided above, which organisational challenge(s) can you identify in relation to the DEIA+B change you want to see?
   - → Thinking with your example, which actors are part of the challenge within the change process? Try to map the actors and place them in relation to these levels: structural, group, individual

3. How can Universal Design be used in your research as a tool to create or initiate this change? (Select all that applies)

3.1 UD can be used as:
   a) a design principle (to generate Services / Programmes / Environments / Products / Other)
   b) a theoretical approach (e.g., as a conceptual framework)
   c) a methodological approach (e.g., to design and execute a study)

3.2 Which opportunities do you experience using UD in your research to create or initiate change?

3.3 Which barriers do you experience using UD in your research to create or initiate change?

Limitations

The survey data is limited to 16 respondents, including the authors of this chapter. The response rate represents less than half of the network, which counted 38 members at the time of the study. Being members of the network ourselves helped us interpret the data, however, it also makes it challenging to analyse the data without bias. We do,

however, consider the empirical insights and analysis presented in this chapter essential as a reflection on the work of the network. Moreover, we consider this study a first step in tracing the different agendas and perspectives, brought forward by the interdisciplinary network to inform the development of critical UD frameworks in a Danish and Scandinavian context.

Theoretical perspectives

We analysed the survey data qualitatively using a grounded theory approach (Lichtman, 2013), identifying themes across responses. To better understand the roles of Bevica, the UD Hub and the research network as actors and drivers of change processes and discuss their possible impact on local, regional, and national levels, we included two theoretical concepts from change theory: the multi-level perspective (MLP) (Geels 2002) and the idea of intermediaries (Kivimaa et al. 2017; 2019; Brodnik et al. 2020).

The MLP positions change within three system levels: niches, regimes, and landscapes (Geels 2002). Niches are "micro-level spaces in which we can observe radical innovations" (Kivimaa et al. 2019, 5). As such, they are characterised as alternative and local small-scale arrangements that combine the system's social and technical elements (Brodnik et al. 2020). Regimes are relatively stable and consist of shared rules, technologies, practices, institutions, and social elements that "guide actors within a system and create pathways along which incremental (step-by-step) change can take place" (ibid., 2). As such, regimes denote the *values*, *norms* and *routines* underpinning the system. Both niches and regimes are embedded in the system, characterised as "a broader social and technical landscape" comprising "the physical world, shared cultural beliefs, political ideologies and large-scale trends" (Kivimaa et al. 2019, 2). In the findings section, we build on the MLP to structure and guide the analysis of our findings. Moreover, we use MLP as a framework for discussing the possible impact evoked by the actors and the network.

To increase the speed and scale of societal changes, intermediaries or intermediary actors are particularly important. Intermediaries are "actors that connect other actors, link their activities and scale up impact" (Brodnik et al. 2020, 2),

pushing change beyond optimising regimes and practices into more "transformative territory" and shaping the broader landscape (Brodnik et al. 2020). As key catalysts in facilitating communication and collaboration towards common goals, intermediaries support the establishment of new actor networks by articulating and aligning interests to bring about desired changes, e.g., as more sustainable socio-technical systems (Kivimaa et al. 2019). Kivimaa et al. (2019) identify five types of transition intermediaries: user-, process-, niche-, regime-, and systemic intermediaries, with different roles based on the level of operation and origin, position, level of agency, and degree of neutrality. Brodnik et al. (2020) further describe *user-* and *niche intermediaries* as grassroots organizations, cooperatives, and local actors aligning niche innovations with regime priorities and demands; *process intermediaries* facilitate a change process or a niche project, often without explicit individual agency or agenda (Kivimaa et al. 2019) or *regime intermediaries* support the regime's redirection to unlock path dependencies. *Systemic intermediaries* serve as catalysts of innovation, driving broader transitions and systems-level impact by orchestrating other actors and intermediaries, fostering a common focus across niches, regimes, and landscapes, and facilitating knowledge sharing to establish a shared language and vision. We use the idea of intermediaries to inform the discussion of the role of Bevica, the UD Hub and the research network as agents and drivers of change processes.

Findings

Niche: Changes From the Inside Out

At a niche level, the researchers are interested in ways to use their disciplines and research to create societal change and address social and structural issues of social inequalities, ableism, inaccessible built environments, social exclusion, hostile architecture, racism, sexism, or stigma towards marginalised communities, in particular disabled people. However, when trying to adopt UD approaches in their research practice, they struggle to find methods and approaches for *doing* this. This is particularly the case for researchers outside of the fields of design, engineering, architecture, and urban planning. Moreover, we find that problem formulations are defined within a specific field of study and are challenging to translate to other fields.

For most respondents, UD creates a tension between the need to be specific and concrete within the discipline and research problem and, at the same time, the need to be interdisciplinary and to generalise their work within a UD framework. An example of this is wanting to support or understand specific communities, and at the same time generalise findings of this community to research. Furthermore, *change* is understood as conditional upon the field of research, the subject of interest, or the communities and individuals involved in investigation or collaboration. The motif of change is for example described by a PhD in architecture in relation to the historical and contemporary biases in Danish architecture and design education, represented: "[...]in the curriculum, syllabus and teaching methods, which reflect normative approaches to the human body in architecture and design."

We observe a shared desire to address social injustice and implement the values and principles of social inclusion, as well as an inclusive view of humanity (in Danish, *menneskesyn*), in which diverse bodies, minds, ways of being, and forms of communication are celebrated and valued in society. A desire to create social change toward diversity in abilities, guided by principles of equity, democratic participation, and social inclusion. However, researchers express different perspectives on these values and focus on various populations and problems, ranging from specific societal issues, such as ableism (a system discriminating against disabled people that assigns value to individuals according to constructed ideas of normalcy, citizenship, bodily norms, or productivity), inaccessible built environments, or hostile design, to organisational concerns, including exclusionary institutional practices, gaps in education and current curricula, and discriminatory policymaking.

Researchers in design, architecture, and engineering focus on the challenges of defining, measuring, and identifying problems in design research and practice in ways that better address marginalised perspectives and experiences and respond to the needs of a diverse user base. They also engage with ontological and epistemological questions within their own fields and canons, asking how design and research disciplines might be reformed locally – along with their existing power structures and social values – to address

exclusion and injustice within academic contexts and specific professions (e.g., social work, architecture, computer science, or education).

We identify a norm-critical approach (Christensen, Guschke, Storm & Muhr 2022) across responses. This can be illustrated with a response of a PhD scholar working at the intersection of engineering and the social sciences when referring to the desired changes or impact of the research:

"To advocate that there are diverse dimensions of inclusion (e.g., gender, disability, race). And, make DEI (diversity, equity, and inclusion) initiatives more integrated, that is to apply both top-down (e.g., policy) and bottom-up (e.g., social interaction) approaches".

The reformist approach expressed by the researchers aligns with the kind of epistemic activism that Haimraie (2017) observes in the early days of UD. Framing their impact of mapping participation and accessibility barriers, with the impacted communities or being able to influence policies and educational programmes to become more inclusive. Furthermore, researchers focus on challenging existing norms reproducing historical forms of exclusion and inequality to develop *situated methodological frameworks* that can account for marginalised experiences of design and social organisation, transparent design methods, inclusive evaluation processes, reflexive design and research practices, as well as supporting the implementation of feedback loops and organisational infrastructures – both bottom-up and top-down. Some contribute with examples of the changes already made in their organisations or projects, such as collaborative initiatives across quantitative and qualitative approaches with communities impacted by exclusive design or policies, or collaborations with practitioners, civil society organisations, and politicians. Researchers also mention the use of accessibility audits, or more concretely, the creation of gender-neutral signage and awareness programmes on intersectional forms of discrimination, not limited to gender or disability but also encompassing a critique to racism, sexism or the inclusion of policies and strategies of inclusion around neurodiversity and mental well-being.

We observe two key challenges across the answers that constitute a dilemma characteristic of UD: Because UD can encompass social inclusion of diverse populations, it is difficult for researchers to find a way to make the approach specific to their cases. At the same time, UD's origin in architecture and its broader application in design pose a challenge in terms of how UD can be implemented in research and practice in fields that do not engage in research-through-design.

While UD, as a concept, enables researchers to gather around questions of norm-criticism, accessibility, diversity, inclusion, or equity, researchers also reflect on the difficulties of working with universalism as both a concrete and vague framework in which the tension of designing for some and an unmarked "all" produces ambiguity in practice. UD, as a term and movement in research and practice, calls for interdisciplinarity for well-being (Lid 2014). However, some of the respondents reflect on how the emphasis on *design* in UD can discourage researchers outside design to contribute to the approach. This is illustrated by the response of a researcher working across computer science and anthropology, who describes the challenges of incorporating UD approaches to her work:

"It could be more intersectional; the word 'design' evokes designers and architects. Crucial actors in the organisation might not think it is relevant enough for them to engage with because they are not 'designers,' and it might feel overwhelming to consider all the different principles."

Most researchers attribute UD problems rooted in ableism, discriminatory practices and policies, or lack of equitable participation in society as we theorise as *wicked problems*: complex problems of multiple overlapping causal relationships, conditional and sometimes contradictory (Rittel & Webber 1973), which make them hard to solve and call for interdisciplinary solutions. While there is certain ambiguity regarding who can develop and adopt UD methods and approaches, it is clear for most respondents that problems of exclusion and discrimination must be addressed across disciplines, practices, and different levels of social

organisation: individual, social, and structural. Furthermore, whilst UD as a term vaguely indicates who benefits from it, researchers define in their answers specific communities they wish to understand and collaborate with, as well as issues with translating UD as an approach across different disciplines in the Danish context. These challenges are apparent as barriers when using UD as a framework, as explained by a researcher:

"Barriers to understanding. It is often applied to an architectural profession, and sometimes it can be challenging to transfer this to other disciplines and practices without misunderstandings". Another researcher similarly explains: "I think that the concept is too fluffy. This challenges the development of existing theory and the assessment of contributions".

A focus on universalism enables interdisciplinary conversations and problem formulations but also causes confusion in well-defined collaborations with specific communities. One member of the network makes this problem clear with a response to the survey "It is difficult to make room for diversity when the concept of UD is not clear enough". Indeed, literature revising the history of UD reflects that it is crucial for UD scholars to ask and clearly define who is included in the terms "all" or "everyone" when we engage in UD (Guffey 2023). Critical literature examining the history of UD reveals that companies and design studios have appropriated UD principles as a marketing strategy, rather than as a method to achieve more democratic and equitable societies (Guffey 2023). The survey responses indicate that the network finds UD as a framework in Danish research that can support change that benefits specific marginalised communities. Yet the promise of universalism remains a barrier to clearly define *who* is responsible for change and *who* will benefit.

Landscape: The interdisciplinary potential of UD

Across the responses, we notice the researchers' recognition of UD as a platform for interdisciplinary research and interventions, and that changing social structures and practices within their disciplines and society at large require interdisciplinary approaches and collaboration. This resembles the broader social and technical landscape, where the niche and regime levels are embedded and merged with

political ideologies and large-scale trends (Kivimaa et al. 2019). Most of the responses involve a range of stakeholders: practitioners from the respondents' disciplines, educators, politicians, civil society organisations, and citizens in marginalised and less advantaged positions. The responses show that UD enables researchers to formulate research problems in terms of both structural and interdisciplinary matters. As one researcher explains:

"UD can help provide an approach to address the lack of competences, and the need to collaborate (across academia, practice and laymen); however, UD must be in dialogue with adjacent concepts (social sustainability, comfort, usability, etc.)".

Another researcher describes: "UD creates a focus on the diversity of needs and the importance of physical settings. Connects the material and the social". When reflecting on the potential of UD as a framework, a researcher outlines:

"I think there is potential in using UD as a guiding principle (value) in the processes and service design toward all groups of users. For this to succeed, we need an easily accessible and translational framework for working with UD towards inclusive organisational change".

UD's value as a framework for interdisciplinary collaborations is evident across the survey responses connected to questions of social inclusion. Answers to the question "What do you wish to change with your research?" outline the ways in which social inclusion is often linked to specific disciplines and communities of practice, as in this example:

"Better quality of life and opportunities for people with diverse abilities to participate in society, with access to work and education. Professional quality in social work, and new social initiatives based on the needs of citizens" (Survey 2024).

What becomes clear from the survey's responses is that the network's members connect research objectives to a larger goal of societal change that requires interdisciplinary research and a multitude of societal actors to be involved in processes of change. The processes of change that respondents refer to have in common the goal of making Danish

society more inclusive and diverse. A change that relies on contributions and efforts across different sectors as well as within the university as an influential institution.

Discussion: The UD Hub and the Research Network as Intermediaries

The survey responses, for the most part, align with Bevica's overall aim: to create and share knowledge and establish a common language for addressing societal change through UD. The responses help us analyse, across an interdisciplinary and diverse research group, how network members seek to effect change across different levels of society. Questions of inclusion, access, and equity appear in relation to questions of interdisciplinary action. While there are challenges in defining UD across different areas of expertise and practice, the diverse background of network members that are bridged through Bevica as a foundation enables researchers to reflect and discuss their impact across institutional and structural levels of society. This is perhaps the most important factor behind networks like Bevica's Interdisciplinary Research Network, which supports interdisciplinary research for social change.

Reflecting on UD as a framework that has travelled to Scandinavia and Denmark, we argue that the network, together with the UD Hub, can be understood as intermediaries. The UD Hub can be considered a *systemic intermediary*, characterised by "operating at all levels (niche, regime, and landscape) promoting an explicit transition agenda and taking the lead in aiming for change on the whole system level" (Kivimaa et al. 2019, 12). The UD Hub is actively working to facilitate transformative change through network creation, knowledge sharing, and the establishment of a common language and mindset around UD in Denmark. Importantly involving academics and practitioners: municipalities, architectural firms, scholars, and other important communities of practice. The research network plays a central role as an *intermediary of intermediaries,* "orchestrating and coordinating these changing positions" (Brodnik et al. 2020, 4). The individual researchers and network members can be considered niche- or process-based intermediaries, working to reshape research and practice within, as well as outside of their disciplinary fields with different forms of an activist agenda. In this light, the network

members can be considered change agents operating and spreading "the word" at the niche level, while the UD Hub is operating across all levels, affecting regimes and, ultimately, changes across public and private institutions that can support societal change and social inclusion.

UD has historically evolved from a movement primarily advocating for design innovations within accessibility focusing on wheelchair access for middle-class white US citizens to encompassing intersectional agendas focusing on design led by blind, deaf, neurodiverse, low income, queer, chronically ill, or racialised communities, among others (Guffey 2023). Accordingly, UD can be understood as an intersectional movement within and outside design and disability activism, encompassing policymaking, education and other areas relevant to public life in which marginalised communities and those who have been silenced or disenfranchised from important decisions about organisational life and design are brought forward to create changes in society towards equity. Researchers in the network adopting a political agenda to amplify the needs of disabled people and other marginalised groups in the Danish society, operate within what is termed *targeted universalism:*

"A targeted universal strategy is one that is inclusive of the needs of both the dominant and the marginal groups but pays particular attention to the situation of the marginal group (...) Targeted universalism rejects a blanket universal, which is likely to be indifferent to the reality that different groups are situated differently relative to the institutions and resources of society. It also rejects the claim of formal equality that would treat all people the same as a way of denying difference. Any proposal would be evaluated by the outcome, not just the intent. While the effort would be universal for the poor, it would be especially sensitive to the most marginal groups" (Powel 2008, 804).

The researcher's orientation toward UD as closely related to targeted universalism demonstrates how UD becomes relevant to researchers as a framework for countering specific forms of exclusion and injustice. Importantly, members are both shaped by the specific ways in which UD is discussed within the network while also influencing who UD may benefit, with their own interest and research focus.

Since the members and the network influence each other, it is important to address the composition of the research network and who gets to influence it. The network currently is represented by predominantly white, Danish, non-disabled researchers employed at Danish universities who, per education and employment level, reside amongst a privileged academic and intellectual elite. The diversity of the network is an important aspect to consider in the future of the network, as the network can benefit from diverse perspectives and world views that will shape the specific UD framework that the network will promote in the future. In the years to come, it is crucial to reflect and document the role of the Bevica Foundation, the UD Hub and its research network to understand how UD networks can support societal change and more inclusive societies. However, regarding the role of the network and of research networks in general a survey is just a starting point. In the future, we encourage researchers to continue to study the network and the work they do and continue to ask questions that can help the network evaluate its methods and ways of working. Future research studies can address: How can research networks dedicated to UD be studied? What role should research networks have? How do you facilitate change through research networks? And what types of changes can be created this way? What opportunities and challenges do research networks dedicated to UD encounter? And how can these inform other networks interested in UD?

Concluding remarks

This chapter has explored the perspectives of members of the Interdisciplinary Research Network. We analysed survey responses of 16 members to examine how they discussed UD as a framework for change. We find that network members wish to address both social issues and material exclusion. However, the scope, scale, and populations researchers collaborate with constitute a patchwork of positions that influence different fields of study, communities of practice, and contexts of investigation, including design, architecture, policy, social science, humanities research, organisational practice, educational institutions, social work, and engineering.

The study offers insights into how an interdisciplinary network for UD can promote social change in the sociotechnical

landscapes and systems of society. The survey responses are analysed using the MLP of change theory and transitions in large sociotechnical systems. The analysis shows that the instrumentalisation of UD as a value-based framework facilitates interdisciplinary approaches and reflections on how societal change occurs at different levels of society. Researchers have a key role to play to reform academic fields within particular areas of society. However, members struggle with UD as a helpful yet vague and ambiguous concept that demands to be specified in each new research context to define clearly *who* benefits from change and *how*. We argue that the Interdisciplinary Research Network and the UD Hub can be seen as a crucial systemic intermediary operating at various levels, with different scopes and connections across different societal levels. In this sense, the Interdisciplinary Research Network and its members can be seen as intermediaries who are shaped by and shape the Bevica UD Hub's approach to making Danish society more inclusive.

Chapter 3

Different Aims and Approaches to Universal Design Research in Denmark

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Background

Presently, numerous researchers are working within the field of universal design (UD) or related value-based frameworks focused on the relationship between humans and their environment and understanding (dis)abilities (see for instance Mace, 1998; Mace et al., 1991; Pullin, 2009; Luck, 2017; Holmes, 2018; Lid, 2021 , Skagestad et al., 2023). The researchers are situated in different research fields, – domains, and – paradigms. Accordingly, their research aims differ and they apply various methodologies for engaging with people. Many of these diverse fields are represented in the Bevica Foundation's Interdisciplinary Research Network (Bevica Research Network), which comprises researchers working with UD in Denmark within their respective fields. The comparison and coordination of different approaches become essential, as interdisciplinarity in our collaboration is evidently highlighted. This research practice knowledge is seldom made explicit, yet conversations and knowledge sharing can reveal differences and communalities.

The interdisciplinary nature of UD underscores its foundational principle of inclusivity. By ensuring that designs are accessible, functional, equitable, and pleasurable, collaboration across various disciplines allows for considering multiple dimensions, including physical, cognitive, cultural, and social factors (Steinfeld and Maisel 2012). For example, an interdisciplinary team working on designing a new public park might include architects for the physical design, landscape architects for the choice and disposition of plants and other natural features, civil engineers for the construction, but also anthropologists, sociologists, and environmental psychologists to consider how people use the park and how the designed space can promote a sense of inclusion and community. The Bevica Research Network exemplifies the importance of this interdisciplinary collaboration by fostering an environment where scholars from diverse fields

explore UD from multiple perspectives. The integration of technical and human-centred insights facilitates a richer, more nuanced understanding of UD, enabling the development of innovative and creative solutions.

As UD intersects with numerous social and technical research domains, the different disciplines involved might employ different research methods to address their unique challenges. Qualitative approaches, such as interviews and observations, allow researchers to gain a deep understanding of user experiences and social interactions (Launsø et al. 2023). Quantitative methods, including surveys and experiments, provide data to describe users numerically (Launsø et al. 2023). Additionally, participatory design, which engages stakeholders directly in the design process, focuses on mutual learning and finding ways in which people's needs and aspirations are integrated into the solutions (see e.g., Simonsen and Robertson 2013). Collaborative case studies and interdisciplinary seminars also play crucial roles in sharing knowledge and blending different methodological perspectives. Whereas interdisciplinarity concerns different academic disciplines fusing and creating new integrated knowledge, transdisciplinarity also transcends academia and involves non-academic participants in this process (Tress, Tress and Fry 2005) of mutual learning that can catalyse institutional change (Roux et al. 2017).

There are well-documented research methods for gaining users' knowledge, however debate continues over research methods' integrity and applicability to describe embodied ways of living (Kajita 2020; Gheerawo 2016). Obtaining relevant information about users is essential for informing the design of built environments, products, services, and systems that accommodate users' diverse preferences and needs. With the intention of developing an interdisciplinary PhD course on UD, a group of researchers from the Bevica Research Network set out to map the various UD practices within the network, especially focusing on methodologies and scopes for engaging with people in various research projects. In what follows, the chapter describes this mapping process of diverse research methodologies and methods applied for investigating everyday living and uses in various situations. The initiative aims to explore commonalities and context-specific nuances of the different research practices,

providing a unique landscape for new interdisciplinary orientation and collaboration.

Method

The network members' various research aims, research methodologies, and interdisciplinarity in projects were mapped and analysed through an initial digital survey and a physical workshop, both conducted in September 2023.

Survey

Everyone in the network was invited to answer a survey based on a self-chosen (ongoing or finalised) UD-related project they worked on. Besides project titles, duration, and the respondents' role in the project, the following survey questions were posed:

1. What is the research field(s)?
2. What is the research aim/objective?
3. What is the research question(s)/hypothesis?
4. What is the study design?
5. What is the research approach for generating (empirical and/or non-empirical) material (methodology)?
6. How do you engage with the research context (methods, informants, environment, datasets)?
7. How do you document core research activities (methods)?
8. What kinds of data do you operate with?
9. What methods do you use for analysing empirical material/data?
10. What is the outcome of the research? For whom?
11. Where do you (wish to) publish and why?

16 members of the network replied to the survey.

Workshop

The workshop included a bottom-up co-analysis, in groups, clustering the printed survey replies with inspiration from affinity diagramming (Kawita 1991). Instead of clustering ideas (as in the original method) three groups worked in parallel and clustered the various answers from the survey using the walls as workspaces. The first group worked with answers to the first three questions; the second group with answers to questions four to six, while the last group worked with answers to questions seven to nine. The printed survey

replies were organised and clustered based on what the group members found as similarities within the sample.

The 16 participants were divided into three groups. Three of the authors present at the workshop facilitated the discussions in each group, and by circulating between different walls, everyone engaged with all the replies and got to know all the projects. The first iteration focused on creating clusters by identifying similarities or patterns in the data, in the second and third iterations, the groups were asked to elaborate on or change the previous groups' clustering and add titles for the different clusters. Each round lasted 45 minutes without any systematic oral handover when changing from one wall to another, but the participants were instructed to re-organise the material if they wanted. The workshop was ultimately finalised by oral presentations of the last group's interpretations of each wall and the various clusters made. The final presentations and a shorter discussion after the first iteration were video recorded, and all three rounds of mapping were photo documented.

Findings

To secure transparency in the content analysis and give a sense of how the different researchers describe what they do, excerpts from all projects are provided, cited by numbers (P1, P2, etc). The findings illustrate the diversity and similarities of the work in the field and how differently UD-related research projects can be practiced.

Research fields

The research projects' length ranged from three to four months (P5 and P9) up to six years (P3 and P6), and most of them involved several organisations and/or people across various academic institutions. Overall, the length and level of detail in the survey replies differed.

The first wall dealt with answers to survey questions one to three. At the workshop, the projects were organised into six "research fields," described in the following:

1) Architecture and Design included four projects. P1 developed a space in care homes for people with dementia, included architecture, landscape architecture, lighting design, and health design; P9 explored physical

and sensory characteristics of the built environment experienced by disabled people; P13 (PhD) studied the role of lighting in the everyday lives of people with visual impairments to create guidelines for lighting scenarios; and P15 gained knowledge on the phenomenon of vision loss and the role of the home environment and lighting included housing research, lighting design, and active ageing.

2) Service Design included three projects. P2 explored the experiences of digital access to welfare provision in collaboration with users of drop-in centres. It included anthropology, science and technology studies, and human-computer interaction; P4 on citizen-centred welfare design, developing new horizontal service models and social technology for increasing social interaction. This project mentioned the following research fields: Welfare technology, senior care, experimental design research, practice-based design research, human-centred design research, and qualitative research; and P11 studied how and why public libraries and librarians engage in the sustainability agenda and the possible impact of this. The research fields mentioned were public libraries, sustainability, sustainable transition, inside activism, future literacy, the SDGs and the LNOB (Leave no-one behind) agenda.

3) Education included four projects. P3 developed pedagogical tools for UD teaching for educators and UD resources for students and other faculties. No research fields were mentioned; P7 evaluated practice-based cooperation aiming to share knowledge and create a model for capacity building to integrate UD in adult learning in a new Knowledge Centre in Lithuania. No specific research fields were mentioned; P14 explored opportunities and support for education for children with neuromuscular diseases using telepresence robots in the education system in Scandinavia. The research fields mentioned were Qualitative Research, Public Health, and Psychosocial; and P16 aimed at understanding the main barriers to access experienced by neurodivergent university students in computer science. The research fields mentioned were Computer Science / Computer Supported Cooperative Work.

4) Health, Treatment and Recovery included three projects. P5 (PhD) developed, tested, and evaluated an electronic PRO questionnaire (NemPRO-2) tailored for use in stroke survivors with cognitive and/or communicative impairments to adjust an existing pilot questionnaire. The following research fields were mentioned: Stroke, aphasia, cognitive difficulties, communicative accessibility, ePRO, eHealth, complex intervention in healthcare, aphasia-friendly materials, digitalisation in healthcare, and inequality in health; P10 explored how it is possible to ensure that an improvement of the physical framework surrounding psychiatric treatment facilities will result in an enhanced recovery of psychiatric patients. The research fields were reported as mental well-being and recovery; P12 aimed to generate knowledge about the involvement of citizens in treatment, research, research dissemination about Parkinson's disease and other neurodegenerative conditions of illness and disability, and to generate knowledge about dance as a form of creative arts therapy in person-centred treatment. The following research fields were mentioned: Participatory health research, Dialogic communication, Arts-based research, and Critical disability studies.

5) Information Technology included one project, P8 on understanding the role of media (and mediatisation) for processes and practices of social recognition (disrespect), which combined media and communications research with social theory and social philosophy (Critical Theory).

6) Labour Marked included one project, P6 explored how to reduce the proportion of youth not in employment, education, or training (NEET), and to support them in becoming self-supporting members of society, reducing their risk of social exclusion and poverty. The following research fields were mentioned: Social science, employment, youth (NEETs), and mental health issues. Evidence-based Supported Employment / Individual placement and support (IPS).

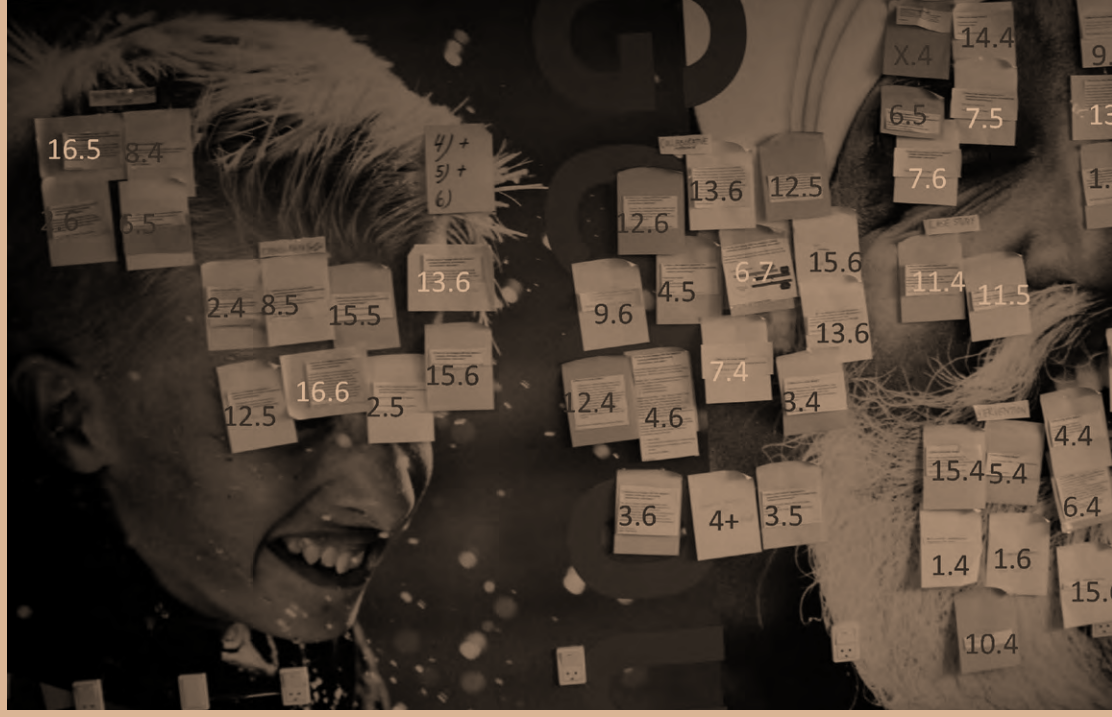

Figure 1 Wall 2 represents the joint co-analysis/clustering of question four, five and six and in addition the authors' mapping of projects after the workshop in order to track projects and answers.

Wall 2 of the workshop mapping included replies to question four, five, and six on research design, research approach, and engagement with research context.

Overall, nine projects (P2, P3, P4, P6, P7, P9, P12, P13, P15) were clustered as having a collaborative research approach. As in the following quotes:

"Research Through Design within the double diamond model. Case studies with means of observations and surveys. We use a number of well-established design methods that are composed as a playbook for participants in co-creation workshops. Prompts and guides for inclusion of participants of diverse abilities used to serve as a constant reminder of the importance of broadening one's perspective while working on engineering projects" (P3).

"Participatory design, co-design, design-anthropology, and performance studies, and Design and Living Labs: 3 co-design workshops with focus on exercise, cultural experiences, and meals [...]. Living Labs. Meeting every week or every second week in Valbyparken for 9 months. Making a new sustainable senior community" (P4).

"The research approach to generate empirical material based on the subjectivity of spatial experience and thus on the need for the direct involvement of the person to learn about his or her unique way of relating to the built environment" (P9).

"In a series of workshops using a range of creative, collaborative art-based methods, people with Parkinson's and their relatives participated in the co-creation of knowledge about bodily, sensual, and aesthetic experiences with Parkinson's dance" (P12).

"In the design part, my part will become more participatory (intersubjective), discussing my research choices and perceptions with the participants, to form a view together on the best praxis" (P13).

A collaborative research approach referred to many different things. As shown above, focus varied from individuals to groups, from one to several encounters with each person,

and whether people involved were affected by disabilities, or relatives and/or professionals, or a combination. Furthermore, the involvement of people also targeted different kinds of knowledge, as regarding spatial perceptions, or bodily, sensational, and aesthetic experiences.

Seven projects (P1, P2, P4, P8, P12, P13, P15, P16) included ethnography/anthropology in various ways: "Drawing on health research, ethnography and design research" (P1); "decolonial and disability anthropology" and "multimodal ethnography using comics and image description as a collective form of analysis" (P2), "design-anthropology" (P4); "(Digital) ethnographic fieldwork including various forms of qualitative interviews" (P8); "architectural ethnography" (P15); "I used the Life Stories Interview approach (by Atkinson) to design my interview guides. [...] I do applied research, and my study participants know that my goal is to help improve the institution, so often they got back to me with more things to say" (P16). Five projects (P2, P6, P8, P12, P16) were clustered as being based on a theoretical outset, two explicitly mentioning main theories. "Ethics of pace (Moya Bailey 2016), crip technoscience (Hamraie and Fritsch 2019)" (P2); "Collaborative research design based on a theoretical framework building on dialogic communication theory" (P12); "I draw on the political-relational model of disability (Alison Kafer), combined with theoretical concepts from accessibility research and Computer-Supported Collaborative Work. I use qualitative methods because they can provide rich insights into both organizational and attitudinal access barriers" (P16). The two following replies explained how both the empirical studies were based on informed concepts from theory, and how theory was used to analyse effects and costs: "The research approach is empirical. The effect evaluation and economic cost evaluation are descriptive. The qualitative studies are based on theoretically informed concepts and existing research to analyse the empirical findings" (P6) and "A qualitative study that aims to synthesize and build social theory, including an empirical case study" (P8).

Interviews played different roles in the projects, for some, as the primary empirical research data, and for others, as the first encounter followed by e.g. collaborative workshops and/or interventions. It seemed that the empirical material in for

example P10, P14, and P16 were mainly generated from qualitative interviews: "Qualitative interviews" (P14); "Qualitative interviews with patients at the mental hospital" (P10), and "Qualitative study based on semi-structured interviews (n=26) with a multistakeholder approach (interviews with neurodivergent students, disability officers and teachers), and document analysis (policies, reports and institutional webpages)" (P16). Several did not mention where the interviews take place, yet P9 described why the project needed to be carried out in a familiar space for the person being interviewed and why they conducted two interviews:

"The research approach to generate empirical material is based on the subjectivity of spatial experience and thus on the need for the direct involvement of the person to learn about his or her unique way of relating to the built environment. This is done throughout two interviews with each participant: first interview for knowing the person and his/her spatial experiences, particularly those related to the feeling of pleasure. The objective of this interview is to know the person, identify a specific location that the participant finds especially meaningful in terms of experiencing pleasure, and the reasons for that. Second interview in the context of the place that the person identified as particularly significant. This second interview is to explore the characteristics of the space and how these contribute to the participant's sense of pleasure. The investigation of the subject's experiences will lead to phenomenological representations to better understand and identify the contextual relation between the place and the person's feeling of pleasure." P9.

Several projects mentioned a mixed method approach: P1 drew on health research, ethnography, and design research, whereas P5 qualitative (semi-structured interviews) were combined with descriptive statistics of datasets from Sundhedsplatformen. P9 combined qualitative (semi-structured) interviews and observations in the field. In P13 the technical assessments were compared to the interview findings with the objective to find patterns on the relationship between lighting conditions and the experiences of individuals with visual impairments.

Research aims and objectives

The aims and objectives of the 16 research projects included in the survey fell into three categories: Understanding; opportunities and improvements; and models and tools.

As seen in Table 1, understanding as an aim played a role in 11 out of the 16 projects, additionally opportunities and improvements were aims for 11 projects, whereas development of tools and models was only an aim for 5 of the 16 projects. It was interesting that only five out of the 16 projects were described as having a onefold aim, either as understanding; opportunities and improvement; or tools or models. The other projects' aims were described as twofold, indicating both understanding and opportunities or knowledge and models/tools or opportunities and models/tools. Only three project descriptions indicated understanding as the only aim whereas the rest focused on opportunities and models and tools. This seems to reflect that research on inclusion, equity and UD has an underlying imperative for change.

Discussion and future directions

The research shows that working with UD within academia is often context-specific and shaped by the field of research, typically situated in smaller niches where UD is combined with and applied alongside other, more field-specific research areas. Furthermore, the analysis indicates that the methods applied were defined by the specific project and discipline. Most projects had several research aims or objectives. These were often problem-based approaches to describe and/or understand an issue, and in many cases, to learn from or change the status quo.

The mapping and analysis revealed commonalities and differences in the various practices. E.g., the theoretical offset or positioning was discussed in one of the groups as some "always start with theory and pre-analysis. To make the interview guide, I needed it to be grounded in some theoretical concepts in advance". While others were more empirically positioned. Moreover, in discussions regarding roles and degree of collaboration, questions like "*is participatory and collaborative the same? How do we place the interlocutors using anthropological approaches? ... or collaborative exploratory interventions*" show that there were different

Table 1 Based on the six identified research fields each project was analysed in relation to whether they provide understanding, opportunities and improvements and/or tools and models.

Research field	Understanding	Opportunities and improvements	Tools and models
Architecture and design.	P9: How physical and sensory characteristics of space help disabled people experience a feeling of pleasure? P13: The PhD project will create new knowledge on the role of lighting in the everyday lives of people with visual impairments P15: To gain knowledge on the phenomenon of vision loss, and the role of the home environment and lighting in this process.	P1: To develop a space in care homes for people with dementia, that allow to stimulate this group of elderly with dementia that cannot get out anymore sensorially, focusing on daylight, visual and smell stimulation from plants and flowers. P9: The objective is to explore and present the experiences of disabled people in the built environment, with particular attention to the nuances of pleasure and inclusivity and the characteristics of the built environment that contribute to these feelings. P10: The aim is to increase the recovery of psychiatric patients by improving the physical environment around psychiatric treatment facilities. P13: Generate guidelines for lighting scenarios, as well as contribute to methodological advancements in post-occupancy lighting evaluations of residential apartments. P15: That housing research and lighting design can benefit from user-focused approaches that consider the changing perceptual functioning and the diversity in visual perception P15: Develop methods that can acknowledge and facilitate the knowledge transfer of this group in a) housing research, b) design parameters acknowledging the dynamics and non-linearity of vision loss and c) support improvement of the physical environment for people with incipient vision loss/ changes.	P1: To develop a space in care homes for people with dementia, that allow to stimulate this group of elderly with dementia that cannot get out anymore sensorially, focusing on daylight, visual and smell stimulation from plants and flowers + a manual.

Research field	Understanding	Opportunities and improvements	Tools and models
Service design	P2: Experiences of digital access to welfare provision in collaboration with users of a drop-in centre. P4: Exploring and developing new horizontal service models and social technologies for increasing social interaction. P11: To understand how and why public libraries and librarians engage in the sustainability agenda and the possible impact of this engagement.		P4: Exploring and developing new horizontal service models and social technologies for increasing social interaction.
Education	P7: To gain knowledge about if and how this cooperation project realizes the aim to explore and develop cross disciplinary models for adult learning. P14: Can a telepresence robot be a supportive compensation for children with neuromuscular diseases in the education system in Scandinavia? P16: Understanding the main barriers to access experienced by neurodivergent university students in computer science.	P14: Opportunities and support for education to children with neuromuscular diseases?	P3: To support the planning and execution of universal design processes and co-creative activities with pedagogical tools. P7: It is a practice-based cooperation aiming to share knowledge and create a model for capacity building to integrate universal design in adult learning.

Health, treatment and recovery	P12: One aim was to generate knowledge about the involvement of citizens in treatment, research and research dissemination in relation to Parkinson's disease and other neurodegenerative conditions of illness and disability. What potentials and challenges arise in the tensions in dialogue in person-centred, participatory research and research communication.	P1: To develop a space in care homes for people with dementia, that allow to stimulate this group of elderly with dementia that cannot get out anymore sensorially, focusing on daylight, visual and smell stimulation from plants and flowers. P5: The overall aim of the PhD-programme is to develop, test and evaluate an electronic PRO-questionnaire (NemPRO-2) tailored for use in stroke survivors with cognitive and/or communicative impairments. P10: The aim is to increase the recovery of psychiatric patients by improving the physical environment around psychiatric treatment facilities. P12: How can we co-create, communicate and spread experience-based knowledge about the therapeutic use of dance for citizens with Parkinson's disease? Another aim was to generate knowledge about dance as a form of creative arts therapy in person-centred treatment. In both cases, a central goal was to further develop practices of citizen involvement in research and research communication and the use of dance in the person-centred treatment of Parkinson's disease.	P5: The overall aim of the PhD-programme is to develop, test and evaluate an electronic PRO-questionnaire (NemPRO-2) tailored for use in stroke survivors with cognitive and/or communicative impairments.

Research field	Understanding	Opportunities and improvements	Tools and models
Information technology	P8: To understand the role of media(tisation) for processes and practices of social recognition (disrespect).	P8: How do deep mediatization constitute and change, and limit or enhance, processes of and struggles for social recognition?	
Labour Market		P6: The overall objective is to reduce the proportion of youth not in employment, education or training (NEET) and to support them in becoming self-supporting members of society, reducing their risk of social exclusion and poverty. The purpose of this project is to evaluate the potential of a modified IPS programme named 'The SE-Youth programme' to support NEETs with symptoms of anxiety or depression.	

interpretations across the projects. Similarly, it was acknowledged that interviews, interventions, and case studies could be practised differently.

A majority of the projects were based on an ambition to get as close to understanding and involving 'possible users', including users as active participants in the projects in co-creation processes, narratives, interviews, films, etc. This indicates that research within the Bevica Research Network focuses on capturing diversity, delving into the individual's experience, and making the lived life visible rather than generalisation and transferability.

Present research has illuminated that, within the Bevica Research Network in Denmark, UD-related research is diverse. The research projects had very different aims, built on different disciplines, applied various methods, etc. Still, we are aware that we have only provided a snapshot of Danish UD research. Possibly future contributions from the research network members will represent an even more diverse and inclusive narrative than UD's original narrative positioned within a design discourse, which is welcomed. The interdisciplinary mapping has been valuable for the network members and has been foundational for the development of a transdisciplinary PhD course on UD, where the ambition was to illustrate and to embrace a whole range of different research approaches. In the mapping workshop one of the junior researchers highlighted this as important when stating: In the PhD course there *"... will be different understandings and epistemological positionings, and some students will already be fluent with certain methods..."* but it is *"important that these preconceptions are made explicit"*.

Our intention by presenting differences and context-specific nuances and bridging commonalities, has been to provide an interesting and inspirational landscape for new interdisciplinary orientation and collaboration. Moreover, we believe that the mutual learning that happens in transdisciplinary projects (Roux et al. 2017) across researchers, stakeholders, and user groups also applies to the research network members. We hope that the diversity and differences presented make readers critically reflect on the often tacit knowledge of our respective research practices. When we share and discuss across disciplines and domains, the

nuances open our understanding, sometimes conflicting with our ontological or even epistemological convictions. It is not easy and commonplace, but requires curiosity, openness, and respect for differences. Still, in a UD field which spans many disciplines, we believe in the strength of different approaches to handle the complexities of the issues we study and the realities we try to inform and even change.

Finally, the diverging level of experience with affinity diagramming and analysing empirical material across projects in groups, was unfamiliar to most participants and caused some confusion during the workshop. For instance, when summing up the mapping in the workshop, one of the groups shared that they had been occupied discussing the objective of the mapping exercise: "One of our major points of discussion was what the categorisation should be used for, e.g. to identify commonalities across the network for future collaboration or partnerships". The second group discussed whether to categorise by target groups, method, or "anything else", and "... categorizing according to 'aim & objective' was difficult. Every time we agreed on a way to categorise, we also found counterarguments for this specific approach." The third group had a much more grounded approach to the empirical material of the responses and was not guided by the initial questions or predefined categories: "Our mapping was more intuitively, looking at keywords, and from the keywords came up with clusters. We did not discuss the purpose or how to categorise; we were more looking at the actual wording of the responses". Additionally, compared to the original approach of affinity diagramming, we added circulating between various walls which further complicated conducting the joint analysis. It worked well in the sense that everyone involved got to know all 16 projects, but was challenging as a tool for joint analysis as one had to continue other groups' work without knowing their reasons behind their clusters etc. This should be something to consider if using the method for analysing empirical material.

To avoid the disciplinary bias of all authors representing fields of design (design-, architectural-, or building research) and letting the different jargons and styles of the individual disciplines be represented, the survey replies, as well as quotes from the workshop have been reproduced (except for a few very long passages). The mapping of the current

research related to UD in Denmark has the bias that the invitation to participate in the interdisciplinary network comes from the Universal Design Hub within the Bevica Foundation. This means that the Universal Design Hub's understanding of UD is pivotal in who is invited. We can therefore not, from this sample and representation, conclude for all research on UD conducted in Denmark. Still, we hope that the work, with its diversity within the field of UD, can be of inspiration for others.

This section offers theoretical reflections on universal design by examining how different understandings of UD shape how change is conceived. By critically examining the historical developments and philosophical assumptions of this evolving field, the chapters in this part offer new insights that can strengthen both research and practice.

Chapter 4 introduces and explains how ideas of social change have evolved throughout the history of UD, starting from the 1980s until today. It reviews some of the limitations of UD's theoretical content and its specificity, and shows how different assumptions about UD are embedded within three key texts.

Chapter 5 builds on archival research and interviews to explore the relationship between functionalism and UD, with a special focus on Danish architecture and design education from the 1920s to the 1990s. The chapter shows how intersectional perspectives have been historically disregarded and highlights the need for educators and others to critically engage with UD by addressing diverse human bodies more comprehensively.

Chapter 4

Foundational Assumptions of Universal Design: Locating Ideas of Social Change in Three Key Texts

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Introduction

This chapter examines ideas about social change that exist in different periods of the (research) literature on Universal Design (UD). We follow Aimi Hamraie's (2016) description of a historical development, where UD – with inspiration from the thinking of disability activists and communities from the 1960s onwards – was originally formulated by Ron Mace and colleagues in the 1980s as an idea that *foregrounded* people with disabilities and "other spatially excluded populations" (Hamraie 2016, p. 10), but later became characterised by a so-called *disability-neutral discourse*, which according to Hamraie is blind to issues around power and privilege and therefore functions more as a marketing strategy than a method of social justice activism. Hamraie's critique points out how certain interpretations and articulations of UD risk reinforcing existing political, economic and cultural hierarchies and thereby undermining the aspiration for just social change that proponents of UD otherwise see implied in the basic idea of the concept – and which the present anthology also revolves around.

In this chapter, we therefore locate ideas about social change in three key texts that represent different periods of UD (research) literature: Following Hamraie, we examine both (1) the initial discourse of "disability-focused Universal Design" (Hamraie 2016, p. 11) and (2) the disability-neutral discourse – but also (3) one of Hamraie's own influential texts, which we consider as representative of a more recent discourse that seeks to redefine or even move beyond UD (see Guffey 2023). More specifically, we ask three overall questions to each of these three texts to approach their ontological and epistemological assumptions in relation to the notion of social change: 1) What is the problem of the 'social world' and how is UD constructed as (part of) the solution? 2) How are various actors constructed and what are their roles in solving the problem? And 3) what sort of knowledge is used/needed to define the problem – and solution(s)?

In this way, this chapter contributes to the efforts to address what Rob Imrie (2012, p. 880) has described as a "call for a deeper level of engagement with, and evaluation of, [UD's] epistemological and conceptual foundations as a basis for strengthening what UD is or ought to be in theory and practice". These efforts relate to the continuous observation that despite the increasing popularity of UD in architecture and design and across other disciplines and fields, as well as related legislative and educational contexts, UD remains poor in terms of theoretical content (e.g., Herriott 2024; Imrie 2012; Lid 2013) or even atheoretical, so that it might fall under a range of different and perhaps contradictory theoretical paradigms, such as functionalism, pragmatism, positivism or critical theory (D'souza 2004).

Richard Herriot asks rhetorically in his paper 'The Incidence of Theoretical Content in Universal Design Research' (2024) if UD is a 'theory'? This, of course, depends on how one defines the notion of theory. Here, we will address some of the foundational issues and assumptions related to UD rather than assessing UD 'as a theory'. However, Herriot has an interesting point at the end of the paper when he states that tentatively "UD theory seems to be more a body of knowledge, with commentaries" (p. 150). Without going deeply into the argumentation, this statement does capture the provisional and eclectic dimension of much of UD theorization. The 'body of knowledge' and its multiple connections to disciplines and fields of practice is not an inaccurate way of describing UD. It should be mentioned that Herriott predominantly has a focus on UD within HCI (Human Computer Interaction) and not so much architecture and design as is the focus in this chapter. Nevertheless, the trope 'a body of knowledge, with commentaries' is a useful pointer for us when we start exploring the foundational assumptions of UD. Moreover, we would claim that moving beyond simply being a body of knowledge with commentaries requires some foundational thinking and reflexivity. Some of which we will suggest in the conclusion of this chapter.

Ronald Mace (1985)

The first text we examine is Ron Mace's 'Universal Design: Barrier Free Environments for Everyone', an "education update" from the November 1985 issue of Designers

West. The brief text is often cited as the foundational text on UD (e.g., Frandsen et al. 2023; Hamraie 2016; Ostroff 2011) and even considered an inspiration for the later UD definition in the *UN Convention on the Rights of Persons with Disabilities* (Ostroff 2011, p. 1.3).

Although the normative basis for Mace's ideas had been developed earlier in his own and others' work and activity (Hamraie 2016, pp. 7–9; Ostroff 2011, p. 1.5), the text includes Mace's seminal definition that describes UD as "a way of designing a building or facility at little or no extra cost, so it is both attractive and functional for all people, disabled or not" (Mace 1985, p. 147). Mace then adds:

> "The concept of universal design will find growing support in the decade ahead as the graying of America produces an ever-larger pool of people with physical limitations. Universal design is the only economically feasible answer to this growing need for access." (p. 147)

While the text later adopts a more disability-focused view of UD, Mace initially engages in what Hamraie (2016, p. 11) calls "a convenient marketing discourse" aimed at persuading architects of accessible design's appeal – a tone that shaped UD's later disability-neutral language. By stressing "little or no extra cost" and framing accessibility economically, Mace presents UD less as social change in itself and more as a response to demographic trends, notably the "graying of America." In his problem framing, "disabled and elderly people" (p. 148) are linked, and this demographic concern expands when he argues that "everyone is 'disabled' to some extent at one time or another" (p. 150) and notes in the section "Current Trends" that "[t]he number of active disabled people is rapidly escalating today" (p. 150).

Mace frames demographic change and related economic concerns as a persistent problem, positioning UD as a timely solution: "Universal design is a concept whose time has arrived" (p. 152). Yet he also identifies a social issue – designers and society hold misconceptions about disability due to historical invisibility and exclusion. While "misconceptions" sounds cautious compared to later UD literature,[1)] it still foregrounds disability in what Hamraie calls a "political act of renaming" that reclaims disability as cultural agency

1) For instance, Inge Marie Lid (2020) argues that the overall goal of implementing UD in all areas of society is to "counteract *discrimination* on the basis of disability" (p. 12, our translation and italicization), just as the notion of *ableism* has become prevalent in the UD literature to conceptualize the very injustices that Mace terms misconceptions, although both to normatively motivate (e.g. O'Neill 2021) and criticize (e.g. Hamraie 2016) UD.

(Mitchell & Snyder 2003, p. 10, quoted in Hamraie 2016, p. 11). Thus, UD responds not only to demographic-economic challenges but also to a struggle for social recognition – though the economic frame remains close in the text when Mace illustrates injustices caused by inaccessibility:

"Young people with moderate mobility impairments are placed in nursing homes because it is too difficult to have them live at home with their families in inaccessible houses. An older couple no longer goes out to restaurants because it is embarrassing when they cannot read small print menus in dim light. A corporation loses an experienced executive who suddenly must use a wheelchair and his job site is inaccessible. A deaf person dies in a minor fire because he is the only one who could not perceive the audible alarm. None of these situations would occur if buildings and products were universally designed." (Mace 1985, p. 148).

Except for perhaps the last example, concerns about expenditure, consumption, and productivity loom in the background.[2] These concerns are brought explicitly to the foreground in the paragraph immediately following, where Mace stresses the unnecessary cost of retrofitting – adding a ramp to a building "may cost $10,000 extra to build" (p. 148) – to meet minimum accessibility requirements instead of designing from UD principles from the outset.

These overlapping yet distinct narratives – UD as an economic necessity and as a response to a social struggle – also become evident when we examine the construction of social actors in the text. Given the presumed audience and Mace's position as "one of the country's foremost authorities on accessible design" (p. 147), designers are conceived as the primary actors. It is designers whom UD "offers the chance to challenge conventional thinking" (p. 152) and who can "provide attractive, inexpensive access for all people" (p. 148). As indicated earlier, Mace's outline of misconceptions seeks to establish some agency for people with disabilities, but primarily as "a viable market segment" (p. 148), beneficiaries of UD, and as part of a much larger overlooked group involving "children, elderly people or women and their differing abilities" (p. 150) – not explicitly as designers or active participants in the design process.

2) See also Mace et al.'s *Accessible Environments: Toward Universal Design* (1991), which starts its overall argument by countering the so-called *"no-market" misconception*, where Mace's different misconceptions from the 1985-text seem to have been named under a common label that, according to the authors, "must begin to give way to a more humanistic recognition of the difference between 'physical disability' and 'environmental handicap'" (p. 3).

Neither Mace nor the editorial introduction invoke his personal perspective as a wheelchair user. However, a related, but distinct, actor-construct appears when Mace highlights "disability rights and accessibility advocates" (p. 150) and a "viable disability rights movement" whose efforts have "forced upon the building industry" new laws and accessibility standards (p. 150), paving the way for designers to move beyond minimum compliance and embrace UD. In this constellation, people with disabilities are framed as an expanded – and expanding – category tied to demographic change, while disability rights advocates push the social struggle for recognition. Designers, in turn, are positioned as responding to or extending this change, aligning UD with both economic logic and cultural transformation.

This brings us to the question of what kind of knowledge is used or needed to define problems and solutions. While it follows from the above that Mace seeks to educate fellow designers about the breadth and agency of people with disabilities – and notes that this is not taught in design schools – this knowledge is generally framed as a one-off revelation, as suggested by his use of the term "misconceptions." Indeed, Mace emphasizes often in the text that designers lack the "correct" or "right" information about specific design products or solutions. For example, in the second-last paragraph he points to the need to specify products that are "well-designed and usable by everyone" (p. 152) but acknowledges that "this can sometimes be difficult without the correct information, especially when one must sift through a myriad of products on the market" (p. 152). Accordingly, Mace devotes the longest section of the text – titled "Products" – to examples of items he considers universal designs, such as door handles, doors, bathtub controls, and electronics.

In sum, Mace's text constructs UD as both an economically rational and socially transformative concept, while framing designers as key agents and people with disabilities primarily as beneficiaries and advocates. This dual framing – between demographic trends and social recognition – sets the stage for later UD discourse, where technical knowledge and product specification remain central to realizing accessibility as a universal design principle.

Steinfeld and Maisel (2012)

The second text examined is Edward Steinfeld and Jordana L. Maisel's seminal work *Universal Design: Creating Inclusive Environments* (2012). As North American scholars and practitioners in architecture and design, Steinfeld and Maisel share both geographic and professional ties with Ron Mace. Their definition of UD builds on Mace's but addresses later criticisms of the utopian implications of "all" and the lack of clarity in outcomes: "Universal Design is a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" (p. 29).

This definition positions UD as a continuous endeavour to address the complex interplay of factors hindering participation. The problem of the social world, as constructed here, is not limited to demographic change but conceived as the universal condition of barriers – persistent, relational, and socially unequal. Steinfeld and Maisel write: "In everything we do, there are barriers: barriers to movement, barriers to space and time, barriers to access, barriers to communication, to perception, or to expression" (p. 4). Barriers are not intrinsic properties of environments or objects; they emerge through interaction with diverse bodies and abilities. Design becomes the active process with potential to overcome such barriers by adapting the "world" to meet people's needs:

> "Through design, humans both remove barriers and develop supportive environments, products, and systems to facilitate achievement of their goals. Design interventions have evolved with human experience and the development of technology." (p. 1)

By situating UD within this evolutionary narrative, Steinfeld and Maisel cast it as the latest stage in a long trajectory of adaptation – "the architecture of social participation, with the goal of equality in opportunity through universal design" (p. 21). UD thus becomes a driver of social change, not merely a response to demographic trends but a proactive strategy for enabling inclusion across all spheres of life. However, this construction of barriers as a universal human condition is significant: it frames exclusion less as a question of power and more as a technical challenge solvable through design innovation. To address this challenge,

Steinfeld and Maisel outline a conceptual framework for UD practice that "requires constant innovation" (p. 69) in form, technology, and marketing. Innovation extends beyond design methods to persuasion strategies aimed at consumers, producers, and policymakers: "Help consumers and clients recognize universally designed products" (p. 69).

This emphasis on market communication underscores a recurring theme: UD is constructed as both an ethical imperative and an economic opportunity. Moral arguments for inclusion coexist with pragmatic appeals to cost-effectiveness and competitive advantage, echoing Mace's earlier discourse but in a more systematic form. The societal problem is thus dual: overcoming barriers to participation while aligning these efforts with market viability. UD is imagined as a mechanism for reconciling social responsibility with economic rationality – a foundational assumption shaping much of the book's logic.

Actors in this narrative are multiple and interdependent. Designers occupy a central role as agents of innovation and custodians of evidence-based practice, tasked with translating abstract goals into tangible solutions that accommodate diversity without stigma. Yet designers do not act alone. Steinfeld and Maisel repeatedly invoke a broader constellation of stakeholders – manufacturers, service providers, policy-makers, and clients – whose interests must be negotiated. These interests fall into two categories: direct ethical commitments to inclusion and indirect economic incentives tied to demographic shifts and consumer demand. Users, by contrast, appear primarily as generalized beneficiaries rather than active co-designers. Despite acknowledging contextual variation, the text offers limited guidance on integrating empirical user perspectives into design processes. Instead, agency is concentrated in professional expertise, suggesting a top-down model in which universal designers identify and remove barriers on behalf of others. Exceptions occur when users possess sufficient financial leverage to influence decisions (pp. 177–178), reinforcing the economic framing of participation.

The knowledge base underpinning this framework is presented as scientific, systematic, and measurable. Steinfeld and Maisel advocate organizing existing knowledge into four

categories – "goals, guidelines, strategies, and best practices" (p. 89) – to support evidence-based design. They introduce eight goals of UD[3] to align with the seven influential, established principles of UD (Connell et al. 1997) (co-authored by Steinfeld) and to address the criticisms of vagueness and lack of operational clarity (p. 88). The new eight goals cluster around three domains: human performance (Goals 1–4), wellness (Goal 5), and social participation (Goals 6–8) (p. 90). Practitioners, the authors argue, "need to know how best to support human performance through the design of the environment and products" (p. 95). For this purpose, four "bodies of knowledge" – anthropometrics, biomechanics, cognition, and perception – are prioritized as sources of reliable data (pp. 88–95). While qualitative aspects and contextual variance are acknowledged, the text privileges metrics tied to "unambiguous classes" as the foundation for design decisions. Knowledge translation is framed as a linear process that "transforms a discovery, from science or practice, to an innovation" (pp. 88–89), reinforcing a positivistic orientation where universality is operationalized through standardization.

However, distinctions between generalizations, knowledge, and evidence remain unclear. For instance, when describing how universally designed laws and equipment could eliminate barriers preventing women from working as firefighters, they write:

"Laws can mandate that, if a woman wants to get a job as a firefighter and is physically and intellectually qualified to do the work, she should receive a chance to compete for the job on an equal basis with men ... if firefighting equipment and protective gear is designed for people of smaller stature and smaller hands, it will make firefighting easier for women to do (and perhaps also for many men)." (p. 182)

Here, social participation is linked to technical adaptation, yet the focus remains on artifacts rather than structural inequities. Besides addressing issues such as quality of life and well-being, the domain of "wellness" bridges the domains of "human performance" and "social participation." Central to wellness is health, closely tied to diversity, as "ongoing health disparities relate to socioeconomic status, race, and gender" (p. 137). Designing for better health

3) These goals are:
1. Body fit,
2. Comfort,
3. Awareness,
4. Understanding,
5. Wellness,
6. Social integration,
7. Personalization,
8. Cultural appropriateness.

becomes both a social responsibility and a financial necessity amid rising healthcare costs (p. 137).

Maslow's hierarchy of needs is invoked to justify a taxonomy of design priorities, from physiological safety to self-actualization, while acknowledging that "not everyone has the same needs" (p. 153). Yet when addressing contexts such as refugee camps, proposed interventions remain narrowly functional:

"The most important priority, or even the only affordable focus of design intervention, may be preventing the spread of disease from poor hygiene facilities, unsanitary water, and insect infestation." (p. 137).

These examples illustrate two tendencies: first, users are constructed in generalized, often abstract terms; second, economic considerations persist alongside ethical claims. Despite emphasis on diversity and context, the operational model privileges standardized data and professional judgment over participatory knowledge. UD emerges as a solution engineered through expert systems rather than co-produced through lived experience.

Thus, Steinfeld and Maisel advance UD as a continuous, innovation-driven process aimed at dismantling barriers and promoting inclusion. Their framework integrates ethical and economic imperatives, positions designers and allied stakeholders as primary agents, and grounds decision-making in scientific evidence organized for practical application. In this sense, Steinfeld and Maisel exemplify what Hamraie identifies as a disability-neutral discourse: one that prioritizes technical universality and economic viability over explicit engagement with structural inequities. While this approach strengthens UD's technical legitimacy and market appeal, it also reveals epistemological tensions – between universality and situatedness, generalization and specificity – that shape its capacity to deliver on the promise of social change.

Hamraie (2017)

The book *Building Access: Universal Design and the Politics of Disabilities* by Aimi Hamraie (2017) is also what we consider a landmark text. Hamraie has become a major voice in critical disability studies, and this work offers an

extensive, critical literature review with its own positioning in the UD field. Its historical and archival dimension is detailed and meticulous, providing deep contextualization of the ideas Ron Mace coined decades ago. The book both summarizes insights from Hamraie's earlier work (some mentioned in the introduction of this chapter) and sets the agenda for critically reinterpreting UD.

Hamraie aims to do three things. First, to provide a more critical and historical account of UD. Second, to bring an intersectional perspective with explicit attention to disability, race, and feminist critiques that attune UD to power and privilege. To advance this ambition, Hamraie introduces *access-knowledge* as a nomenclature for "a regime of legibility and illegibility [that] emerged from interdisciplinary concerns with what users need, how their bodies function, how they interact with space, and what kinds of people are likely to be in the world" (p. 5). Third, Building Access places the category of the "user" at the center – particularly how the "user" has been a "shifting figure" that over time enabled new justifications for material practices and ways of envisioning UD (p. 5).

Instead of going deeply into the text (which is not possible within this short chapter), we highlight key markers of Hamraie's contribution and the foundational assumptions it exposes. If one feature stands out, it is criticality. The ambition to rewrite and rethink UD's history with a critical lens is the book's main contribution, leading to vital repercussions for UD's underlying assumptions.

This focus rests on a detailed historical account of universal (or inclusive) design as emerging from efforts to rehabilitate wounded WWII soldiers and reintegrate them into a booming post-war workforce – revealing how UD was tied to economic productivity. This connects to Hamraie's ambition to show the plasticity of the "user" as a shifting figure enabling new justifications for design interventions. What appears as an inclusive response to vulnerable groups also reflects a pragmatic need for labour in a capitalist system. Thus, Building Access calls attention to UD's blind spots regarding power and the societal rationales behind its embrace in policy and regulation. It teaches how UD's development links both to emancipatory discourses for

citizens "out of sync" with the built environment and to economic imperatives for growth. As Hamraie argues:

> "By treating Universal Design as a shifting historical discourse, a tool for making distinctions to create meaning and shape material realities, rather than a stable idea or practice, this book disentangles the aspiration for a more accessible world from the ideologies and values used to promote it." (p. 7).

Hamraie urges us to disentangle the foundational assumptions behind UD, which extend beyond Mace's personal experience as a wheelchair-dependent architecture student excluded from campus. This means recognizing the societal values and ideologies that sustain UD at different historical moments and incorporating a sense of power and exclusion into its framework – elements Hamraie finds missing in mainstream UD discourse. Drawing on critical disability, race, and feminist perspectives, Hamraie asks: "how did Mace's concept [Universal Design] come to signify a disability-neutral approach?" (p. 7). The answer, according to Hamraie, lies in UD being "ahistorical and under theorized" (p. 8), lacking critical methodologies from the humanities and social sciences. While this is a broader debate, Hamraie's position that pragmatic fields like architecture could benefit from theoretical rigor is valid (Jensen, 2024).

Actors in Hamraie's narrative foreground these tensions. Disabled activists appear not as passive beneficiaries but as epistemic agents whose embodied critiques – such as the Capitol Crawl – exposed discriminatory built environments and catalyzed legislative change. These acts of "epistemic activism" challenged dominant notions of the user and unsettled rehabilitation experts, whose focus on productivity and normalization shaped accessibility standards. Designers are depicted ambivalently: as participants in techno-scientific regimes that objectified disabled bodies, yet also as potential allies in "crip technoscience", where design becomes a site of resistance and world-building. Institutions – universities, research centers, funding agencies – figure prominently as arenas where knowledge and power converge, shaping UD's scope and meaning. The Center for Universal Design, for example, emerges as both a catalyst for

innovation and a conduit for rehabilitation logics, illustrating complex intra-actions between activist ideals and bureaucratic structures.

Knowledge, in Hamraie's account, is not neutral but a terrain of struggle. The book traces how access-knowledge materialized through practices like anthropometry, usability research, and environmental design studies – methods promising objectivity while reproducing normative assumptions about race, gender, and ability. Hamraie critiques these positivistic practices, which rendered diverse bodies legible through measurement and standardization, often serving liberal ideals of productive citizenship (pp. 223–239). At the same time, the text highlights counter-knowledges from disability movements, feminist theory, and critical race studies, reframing access as justice rather than efficiency. This epistemological contest underpins Hamraie's call for a "critical Universal Design" attentive to history, ideology, and intersectionality. Rather than treating accessibility as a technical fix, Hamraie situates design within systems of oppression and imagines futures grounded in collective access and liberation.

Other critical discussions deserve attention: the ambiguity of "universality," which at times confused more than clarified and earned UD the label of "common sense"; UD's neglect of marginalized groups such as homeless people, refugees, aging populations, and ethnic minorities; and its unfulfilled potential to connect with disability justice, design justice, and design ethics. While *Building Access* critiques UD, it does so constructively – engaging its blind spots without dismissing its relevance. UD is neither static nor theoretically coherent, but remains a vital field for addressing exclusion in the built environment. Ending on Hamraie's positive note:

"Reorienting Universal Design towards disability justice lets us imagine a future in which the legacies of racial segregation, mass incarceration, homelessness, immigration systems, and environmental injustice, alongside aging, disability, and gender are issues that shape who counts as 'everyone' and how designers can know. But these futures will require realigning Universal Design's relationship to disability. If the stories we tell about bodies and users matter for questions of justice, then it is with more accountable, historical knowing-making that we must begin. How we take up space depends on it." (p. 261)

Table 1 Construction of problem frames, actors, knowledge and the role of UD in social change in the three key texts, as well as development in construction over time.

	Mace (1985)	Steinfeld and Maisel (2012)	Hamraie (2017)	Development in constructions over time
1) What is the problem of the 'social world' and how is UD constructed as (part of) the solution?	Demographic change; misconceptions about disability	Universal barriers hindering participation	Power hierarchies, capitalist logics, lack of critical reflection	From demographic/ economic adaptation to justice-oriented critique
2) How are various actors constructed, and what are their roles in solving the problem?	Designers as primary agents; people with disabilities as beneficiaries and advocates	Designers as expert innovators; stakeholders as partners aligning ethics and market viability; users as generalized beneficiaries	Disabled activists and users as epistemic agents and co-designers; designers as ambivalent; institutions as arenas of power	Shift from top-down expert-driven to participatory/ activist-centred
3) What sort of knowledge is used/needed to define the problem – and solution(s)?	Pragmatic "information" (about products)	Scientific, positivistic data; evidence-based guidelines	Critical, intersectional, historical knowledge	From technical standardization to epistemic activism
The role of UD in social change	Reactive response to demographic trends and justice struggles	Continuous process of barrier removal and market expansion	Perspective for dismantling oppressive structures and reimagining justice	From accommodation → innovation → structural critique

Universal Design is "still under construction" in Hamraie's account, and its capacity to address social change and justice depends on confronting the foundational assumptions and epistemological blind spots identified in this key text.

Concluding remarks

Table 1 provides a condensed overview of our answers to the three guiding questions and the development of ideas about social change across the three texts. It illustrates a trajectory from accomodation (Mace) through innovation (Steinfeld & Maisel) to structural critique (Hamraie). Yet this synthesis also reveals that UD's foundational assumptions are far from uniform: they differ in how they define the social problem, construct actors, and mobilize knowledge.

Our analysis shows that Mace and Hamraie converge on foregrounding disability, albeit in different registers – Mace pragmatically, Hamraie critically – while Steinfeld and Maisel exemplify a disability-neutral discourse that leans towards framing exclusion as a technical challenge rather than a question of power. These differences shape the imagined role of UD: for Mace, a reactive response to demographic and justice struggles; for Steinfeld and Maisel, a continuous process of barrier removal aligned with market viability; for Hamraie, a critical project aimed at dismantling oppressive structures and reimagining justice.

However, these texts share another feature: they are all North American. While they are rightly considered key contributions, UD has developed along other trajectories. Scandinavian scholarship, exemplified by Lid (2020), offers arguably a more normatively robust interpretation of UD. Lid situates UD within what could be termed a welfare-state framework, emphasizing equality, participation, and citizenship as ethical imperatives. UD here is not a technical abstraction or a marketing strategy but a moral commitment to inclusion, grounded in human dignity and rights. This perspective reframes UD as a societal obligation rather than a design option, aligning it with CRPD and the principle that "no one shall be left behind" in the UN Sustainable Development Goals.

Lid's relational model further challenges static notions of universality. Rather than treating universality as uniformity,

it understands accessibility as emerging from the dynamic interaction between individuals and environments – a "gap" to be closed through systemic and contextual interventions. This approach resonates with Hamraie's critique of ahistorical and under-theorized universality but moves beyond critique by offering a constructive normative foundation. It also underscores that universality cannot be reduced to compliance with technical standards; it requires ethical sensitivity, participatory processes, and recognition of diversity as a societal value.

These insights point to an unresolved question: What should count as the foundational assumptions in UD theory and practice? Our three texts provide partial answers – economic pragmatism, technical standardization, critical justice – to put it bluntly, but none of them fully articulate universality as a normative principle. Lid's contribution suggests that future UD scholarship must integrate ethical and relational perspectives with global commitments to equality and sustainability. Doing so would strengthen UD beyond "a body of knowledge with commentaries" (Herriott 2024) and position it as a transformative framework for social justice.

In short, UD remains "under construction." Its capacity to deliver on the promise of social change depends on critiquing and transforming these divergent discourses – market-oriented, technocratic, critical, and welfare-based – into a coherent, reflexive, and ethically grounded paradigm.

Chapter 5

Universal Design: A Shift from or an Extension of Functionalism?

Christine Bjerke, Emil Falster

Introduction

Universal Design (UD) has emerged as a critical framework for designing and fostering buildings, environments, and products that are accessible to as many people as possible, regardless of disabilities. At its core, UD often emphasises usability and functionality. Principles that appear to echo key tenets of Functionalism; a paradigm that dominated architecture and sociology throughout much of the 20th century in Western Europe. This chapter examines the relationship between Functionalism and UD in sociology and architecture, with a primary focus on Danish architectural and design education from the 1920s to the 1990s, when Functionalism emerged. We do this by investigating how functionalistic ideals are present in architectural and design pedagogies and how to critically assess their roots in relation to UD. This, with the aim of contributing to the continuous development of UD and to inform how it is applied in education. Further, highlighting how norms foster different forms of inequalities and how they connect and accumulate. As for instance argued by the scholar Jay T. Dolmage (2017); "Ableism is never alone."

In this chapter, we bring together the perspectives from sociology and architecture as an interdisciplinary study, to enable the chapter to investigate the connections between education and society more thoroughly. In the first part, we introduce background, theories, and critiques of Functionalism in sociology and architecture. This is followed by an analysis of selected empirical archival material, which is then discussed in relation to the theories of Functionalism in architecture and sociology. Further, we will identify potential critiques of UD and reflect on these findings in relation to how to continue to critically develop UD. In this regard, the investigations in the chapter are especially interested in the emphasis on participation and social integration, which is present in both Functionalism and UD. As UD possibly has persistent roots from Functionalism, does it for instance then also consider people who cannot or

would not like to participate and be actively included? By investigating the functionalist origins of UD, we thereby ask the question: Is UD a shift from or an extension of Functionalism?

Background

Functionalism in sociology and architecture

In sociology, Functionalism represents a theoretical approach that views society as a whole composed of various parts, each with distinct functions, working together to maintain the stability and social order in society. The approach was founded by sociologists such as Herbert Spencer and Émile Durkheim in the 1880s and further developed by thinkers like Talcott Parsons and Robert K. Merton during the 1950s. In Functionalism, society is understood as an organism, where institutions, norms, and social practices have specific and specialised functions that ensure the stability and reproduction of society. Just as the organs of the human body work together to ensure survival, society's systems and institutions cooperate to preserve stability. One of Functionalism's most fundamental ideas is that institutions – such as the family, the educational system, religion, and the legal system – serve specific purposes necessary for society to function as a cohesive and stable whole. For instance, the family's function is to socialise children, while the educational system prepares individuals for the labour market and instills them with dominant cultural values and norms within society. This aligns with the functionalist notion that society's various components operate most effectively when they work together and when there is consensus among its systems and members regarding societal values and norms. Functionalism and the development of the Danish welfare state are closely intertwined, as both are grounded in the idea of society as a system of interdependent parts that contribute to overall stability and continuity (Till 2006; Rostgaard & Christensen 2022). The Danish welfare state – particularly from the 1960s onward – was built on the functionalist notion that social integration and shared cultural values and norms promote cohesion and societal stability (Ibid.). This principle is evident in the historical policies of the Scandinavian welfare states, which have consistently aimed to reduce social disparities and inequalities. However, from the 1930s to the 1980s, this same

commitment to cohesion was paradoxically accompanied by the institutional confinement of disabled people in large-scale residential facilities – what Goffman (1961) would later describe as 'total institutions'. Framed as care within a biomedical and functionalist discourse, these institutions regulated all aspects of daily life and enforced a spatial and social segregation that excluded disabled people from mainstream society. In this context, institutionalisation can be seen not merely as a logistical or medical response, but as a socio-political mechanism for safeguarding normative social order through the marginalisation of those deemed unable to conform to dominant standards of ability, productivity, autonomy, and non-disabled citizenship.

Functionalism has faced considerable criticism for its deterministic outlook and its tendency to overlook social class conflicts and structural inequalities within society. Sociologists Karl Marx (Marx & Engels 1848) and later Ralf Dahrendorf (1959) argued that societal subsystems and institutions do not serve the interests of all members equally; instead, they often reinforce the power and privilege of dominant groups. From this perspective, Functionalism fails to account for the unequal distribution of power and privileges, as well as the conflicts that arise from these disparities. Feminist theorists, such as Betty Friedan (1963) and Simone de Beauvoir (1949), have highlighted how Functionalism implicitly reinforces traditional gender roles by portraying them as essential for social stability. This approach, they argue, legitimises gender inequalities and upholds patriarchal norms by framing them as necessary components of societal order. Subsequently, sociologists such as Pierre Bourdieu and Anthony Giddens have sought to move beyond Functionalism, for example by reconceptualising the actor-structure dichotomy (Bourdieu 1977; Giddens 1984). In summary, these critiques reveal significant limitations in Functionalism's ability to address inequality, power dynamics, and the transformative potential of conflict. By focusing predominantly on stability and consensus, Functionalism risks ignoring the very forces that drive social change and shape the lived experiences of individuals and marginalised groups. Within Functionalism, conflicts or deviations from norms are considered temporary disruptions, typically corrected through social mechanisms such as legislation, education, or social and criminal sanctions. This emphasis

on stability and continuity is both a strength and a limitation of Functionalism: While it is well-suited for explaining how systems and institutions work together, it is less effective in analysing societal inequalities, value disagreements, and the conflicts that arise from them.

In architecture, Functionalism emerged in the early 20th century as part of the broader Western modernist movement (Till 2006; Rostgaard & Christensen 2022). As also argued by disability scholar David Gissen (2023): "Functionalist concepts became instantiated in architectural practice and education from the beginning to the middle of the 20th century, particularly in Europe and the Americas". It emphasised simplicity, utility, and the integration of *form follows function*. Rooted in ideals around efficient and standardised designs, it aimed to prioritise the needs of "the masses". Further, it extended beyond individual buildings to urban planning and public infrastructure, aiming to improve societal well-being and productivity through human-centred design processes. In Danish architecture, the functionalist principles were primarily introduced by architect and educator Kay Fisker from around 1900 and continued by architect and educator Kaare Klint from the 1920s. Although they did not necessarily actively position themselves as functionalists, they were both building on international functionalist principles, as for instance: efficiency, productivity, and standardisation. In this regard, Klint focused on the human body through measuring that became recognised guidelines within the field of architecture and design in Denmark from the 1920s and onwards (Hansen 2018). Following Klint, other architects and designers – often students and employees of Klint – employed a similar methodical approach to gathering dimensions of the body (Ibid.).

Functionalism in architecture has faced substantial critique, both within and beyond Denmark (Till 2006). One key criticism is that it tends to disregard the social context of complex societal structures, leading to design solutions characterised by uniformity and homogeneity. These solutions often fail to account for individual differences and the diversity of human needs and abilities. Disability scholars, such as Aimi Hamraie (2017), have extended this critique by highlighting the exclusionary assumptions often inherent in functionalist design. Drawing on the concept of the

"normate", a term coined by humanities scholar and thought leader in disability justice and culture Rosemarie Garland-Thomson in the 1990s (1996), Hamraie challenges the medical model of disability, which frames the disabled body as something that needs to be fixed to fit into society. Instead, this critique advocates for centering "non-normative" bodies in architectural discourse, emphasising inclusivity and the recognition of human diversity and bodily variations.

Analysis

Crip genealogies

The empirical data in this chapter is based on a PhD study working with archival research to contextualise the historical perspective on the human body in architectural and design education in Denmark.[1)] The archival material has been collected from Danish public and private archives, with a primary emphasis on educational institutional archives from past and today's architecture and design schools. To investigate the archival material as empirical data, the study collects, organises, and analyses the findings as an incomplete genealogy of pedagogies, drawing on the contemporary approach of crip genealogies (Chen et al. 2023). The study enables the exploration of divergent histories, critical reflections across centuries and decades, and unveils how various forms of inequalities intersect and accumulate.

Identified representations of the human

Common to the theories of Functionalism in sociology and architecture is the notion of the "measurable human" through standardisation and the focus on a so-called "average human" as the starting point for design processes. These norms and 'normate templates', as previously argued by Hamraie (2017) and Garland-Thomson (1997), emphasise the dominant role of standardisation based on a non-disabled human. This chapter examines four key archival examples that illustrate pedagogies focusing on the human body in relation to architectural and design education in Denmark. These examples are identified as 1) The productive human, 2) The standardised human, 3) The functionalist human, and 4) The individualistic human. They are selected to highlight the pedagogical approaches and methods applied in teaching, spanning from the early 1900s to the late 1990s. Together, they represent significant moments that reflect both the shifts and the continuity of functionalist ideals over

1) The PhD is under development by Christine Bjerke, Centre for Spatial Inclusion, Royal Danish Academy, 2024.

time. Based on the analysis of the archival material, this study identifies these examples as functionalistic. However, the authors of these examples might not have officially identified directly with Functionalism at the time. While this chapter focuses on the past century, the emphasis on the non-disabled human in Danish architectural and design education can be traced the whole way back to the 1750s, when the first formal architecture program was established.[2)]

The productive human

The first archival example traces back to the early 1930s, when Functionalism was introduced in Danish architectural education. [3)] → Figure 1 It exemplifies the earliest – in the archival research – known official pedagogical description of Functionalism in Danish education and was introduced by Klint. Based on the description of the Furniture School at the Royal Danish Academy, which Klint founded in 1924 and led until his death in 1954, the pedagogy was evolving around the human, as argued by Per H. Hansen (2018). In this curriculum description Klint explains; "Measurements as preliminary to later reworking – human dimensions and movements – the measurement of objects – constructive relationships in connection with decisions about usage – methods of joinery treatment of texture, aesthetic considerations, communal work." (Klint 1930, pp. 193–224). It is noticeable in the pedagogical description that the body is visually indirectly represented through furniture, objects, and clothing. It depicts and describes an upper-middle class, non-disabled, male, as the human standard. Mentioned as a man's wardrobe in the material, all elements represented in the visual are standardised and systematised to accommodate the man to be productive and able to participate in society (Klint 1930). It is apparent that other human bodies deviating from this drawing are not considered, and as scholar Patricia H. Collins (2019) unfolds through intersectionality as the accumulating inequalities of social categorisations such as socio-economic class, disability, and gender.

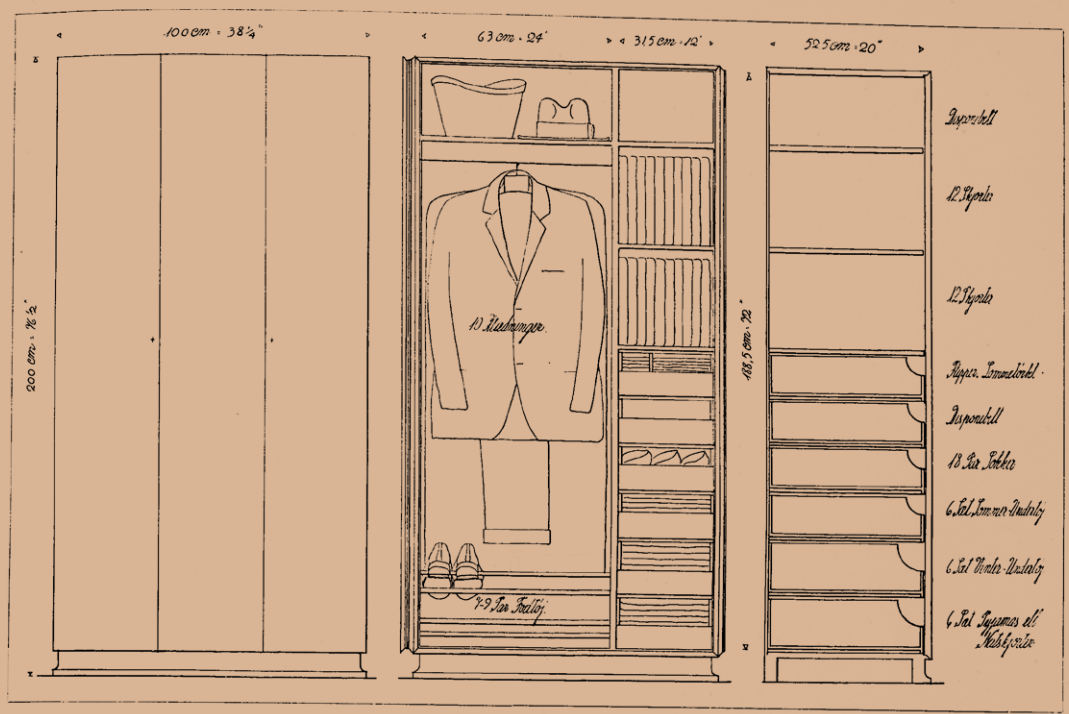
The standardised human

Following the functionalist traditions dating back to the 1920–1930s, this pedagogical approach was later reinterpreted and practiced by multiple teachers in different architecture and design schools in Denmark.[4)] The second archival example is from the 1970s and exemplifies the

2) The first architecture institution was The Academy of Painting, Sculpture, and Architecture (Maler-, Billedhugger- og Bygnings-Academiet) established in 1754.

3) At this time the education was categorised as architecture, however it included the scale of for instance furniture.

4) This is supported by the empirical data from the archival research in this study.



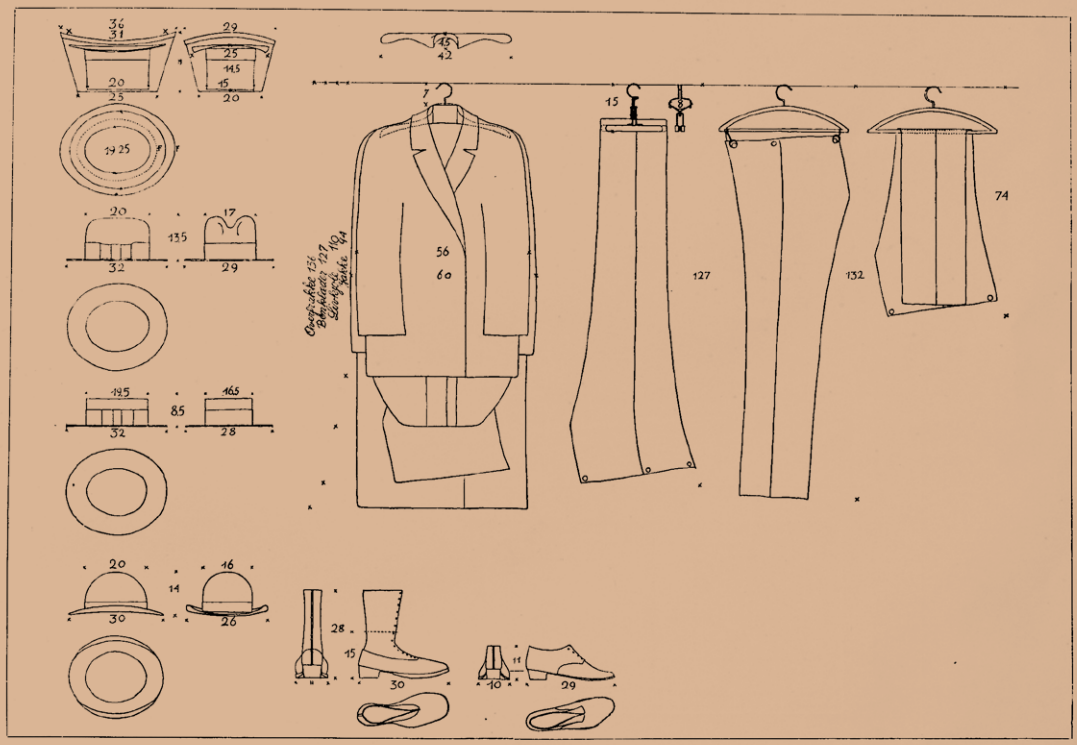


Figure 1 The image depicts a technical line drawing or design schematic by students Flemming Teisen and H. Hachenberger in the pedagogical description by Kaare Klint from 1930 for a wardrobe, including precise measurements and illustrations of how clothing and accessories are organised. The scale and proportions of the clothing illustrated suggest a standardised non-disabled male. This is evident from the clothing and shoes, which traditionally cater to male attire of a certain class in society. It reflects assumptions about uniformity in body size, clothing preferences, and gender roles. Photograph by the authors.

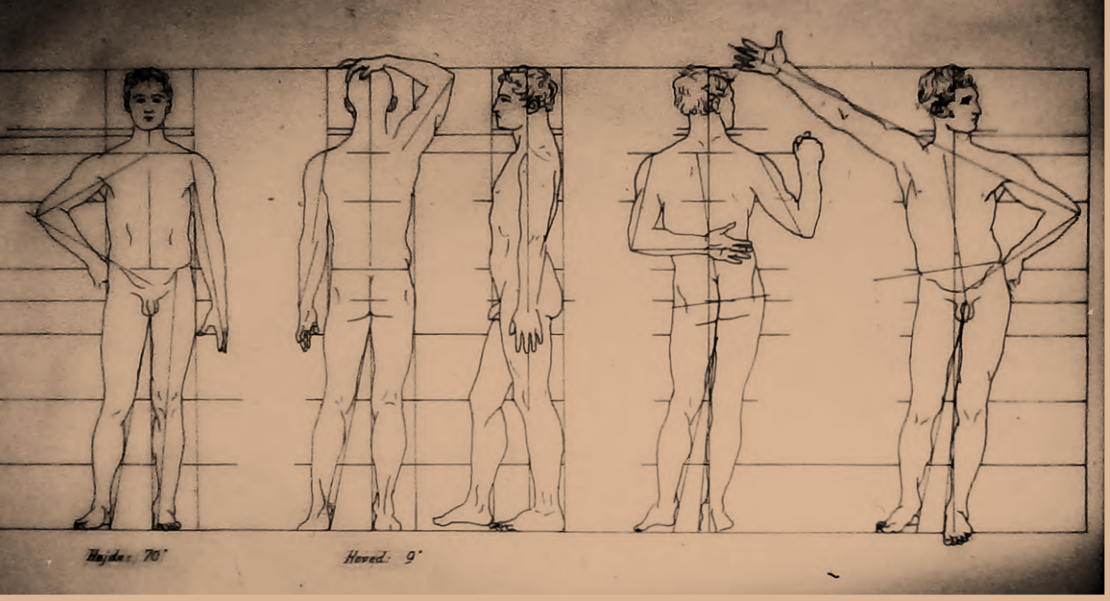


Figure 2 This image depicts a series of schematic line drawings representing a human body in poses emphasising the muscular body. The drawings are dated 1978–1979 from a workshop at The School of Applied Art. The grid emphasises proportionality and measurements, suggesting a focus on the mathematical and geometric analysis of the human body. It represents a series of non-disabled male figures, with references to Ancient Greek and Roman ideals. Scanned analogue slide by the authors.

dominant role of measuring from the foundation of Functionalism as an applied teaching method in the education of architects and designers. → Figure 2 Throughout the 20th century, the archival research reveals that the act of measuring the body was key to teaching. The example included in this chapter depicts one of these instances, through a series of drawings from a workshop at The School of Applied Art[5] in the late 1970s. The students were asked to do anthropometric drawings of selected male and female bodies. However, the body is often depicted as a non-disabled male figure. This exemplifies a continuation of the human as non-disabled and often male through a biomedical approach to the applied teaching of the body. In this example, the description of the group work findings also acknowledges variation of the body; "We have taken a few examples: To reach upwards, forward to the side, registration of a simple sitting position. One could have brought out other equally – or more – relevant things – e.g. how eye level varies with different positions. One could also have talked about traditional movement patterns – people in different cultures move differently – and therefore create different furniture. But we had to stop somewhere." (Description of workshop findings, The School of Applied Art 1978–79). Although the description touches on different variations, it still does not address disability as significant to the teaching of the body in architectural and design education at the time.

The functionalist human

A decade later, in the 1980s, the archival research identifies examples of pedagogies that are referring directly back to the functionalist roots of the 1930s.[6] One such example is a compendium from Aarhus School of Architecture from 1985 by architect and educator Arne Karlsen.[7] → Figure 3 It exemplifies the use of the renowned anthropometric drawing by Klint from 1917 on the cover of the teaching material. → Figure 4 The image depicts a non-disabled male figure with stretched arms, reminiscent of the *Vitruvian Man* by Leonardo da Vinci from the late-15th century. The body is contextualised from various notes about distances and relations between measurements, especially also to furniture and objects. However, the image is cropped to not include the context of other humans and most of the furniture and objects in the original drawing, emphasising a focus on the individualistic. The isolation of the human figure is noticeable

5) The School of Applied Art (established in 1973), in Danish: Skolen for Brugskunst. Later known as Danish Design School, which was established in 1989.

6) See first archival example and Figure 1.

7) Karlsen was a student of Klint from 1945–1950 and he later became rector of Aarhus School of Architecture from 1968–1972.

as it removes the contextualisation that was otherwise present in the initial functionalist approach from Klint.

The individualistic human

Lastly, in the 1990s, the archival research identifies that the functionalist roots are still present within pedagogies and applied teaching methods. One such example is from the Danish Design School in 1994 as the yearly compendium for foundational teaching in drawing.[8] → Figure 5 It depicts a muscular non-disabled male figure isolated without context on the cover of the applied teaching material. One such representation can be argued to reproduce the idealised approach to the body, as it solely focuses on the anthropometric and does not consider diverse bodily abilities and needs. Further, it isolates the body from a spatial and relational context. Instead, it refers to known historical conceptualisations of the human body based on geometry, anatomy, and non-disabled male figures reminiscent of certain ideals, as also exemplified in the archive material from the 1980s. Further, it can be argued that this newest instance is an example that ties most directly to ideologies and ideals three centuries back to the 1750s, when the first architectural education was established in Denmark.

The four archival examples across Danish architectural and design education reveal commonalities emphasising non-disabled and masculine representations as the ideal body. Notably, the most recent examples tend to revisit and perpetuate the earliest ideological bodily frameworks, demonstrating the persistence of normative principles in relation to the body. This continuity and interpretation underscores the possibly enduring impact of entrenched biases within education. By analysing these patterns, this study highlights the need for more inclusive approaches that broaden representations of human diversity, opening up to transformative changes in education.

Discussion and reflections

Functionalism in architecture is as mentioned rooted in the idea that form should follow function, prioritising functionality and efficiency in design. In sociology, Functionalism describes society as a system where various parts work together to maintain stability, functionality, efficiency, and social order. Both forms of Functionalism are primarily

8) The same drawing can be found on the compendium published three years later in 1997.

Figure 3 This image depicts the cover of the compendium for 'En linie i Dansk arkitektur og brugskunst' ('A programme in Danish architecture and craft') from the Aarhus School of Architecture, department of møbel- og rumkunst og industriel design (department of furniture, spatial and industrial design), by Arne Karlsen dated to 1985. The image on the cover is part of the technical drawing by Kaare Klint from 1917, featuring a non-disabled male figure with arms outstretched, reminiscent of Leonardo da Vinci's *Vitruvian Man* from the 15th century. The figure is positioned within a grid-like framework, indicating measurements and proportions. The sketch includes various notes and annotations, likely describing dimensions or design elements related to the figure and surrounding objects. Photograph by the authors.

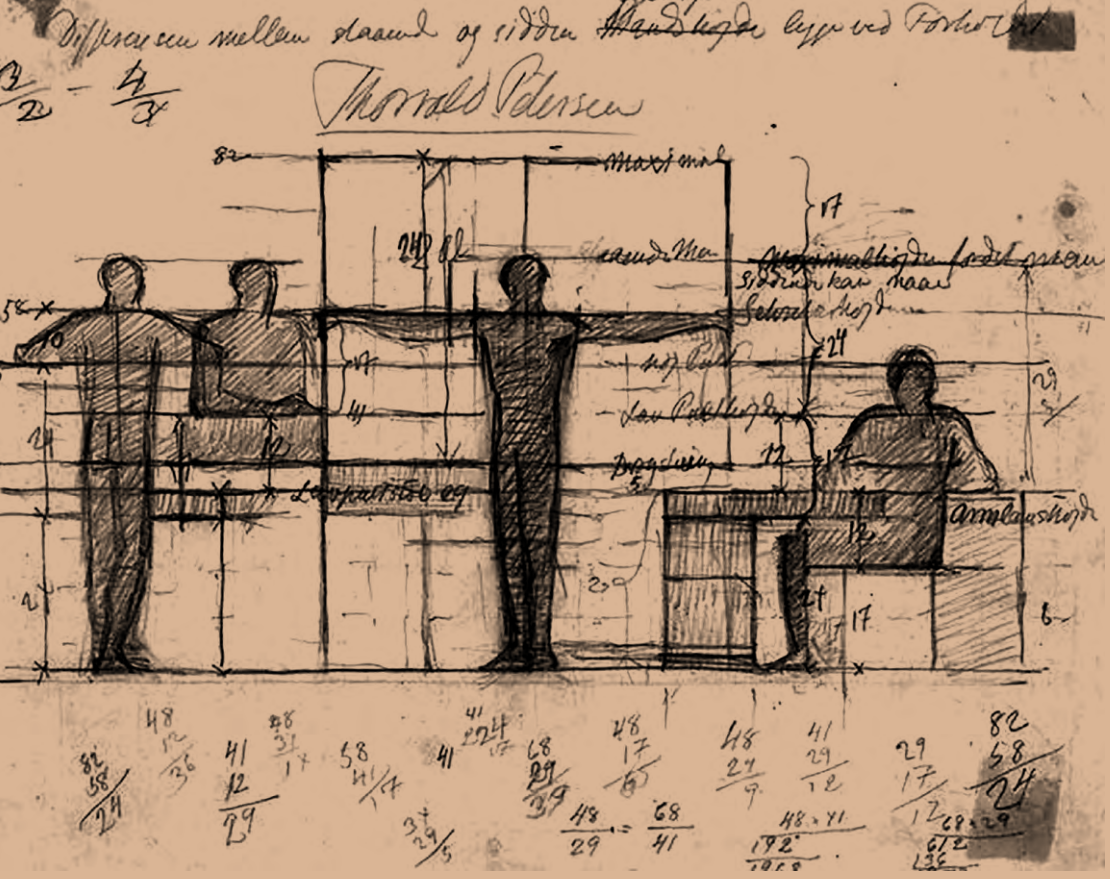


Figure 4 The image depicts drawing studies for a factory made shelving system by Kaare Klint from 1917. The image appears to be a technical line drawing sketch that features human figures interacting with different furniture and objects. The sketch includes three human figures depicted in various postures – standing, reaching, and sitting. These figures seem to be used to measure or demonstrate the interaction between human bodies and the surrounding built environment. Central to the image, a non-disabled male figure is featured with arms outstretched, reminiscent of Leonardo da Vinci's Vitruvian Man from the 15th century. The drawing is overlaid with a grid, and there are numerous numerical annotations around the figures and structures. These annotations likely represent measurements or proportions related to the human figures and the architectural elements they are interacting with.

based on a one-sided understanding and representation of the human being as a standardised, productive, and average non-disabled individual. The question that arises is whether UD represents a radical break from Functionalism or an extension of it? In the following, we will discuss the conceptual overlaps and critical divergences between UD and Functionalism, considering the analysis of the empirical archival material, and theoretically examine the paradigms' possibilities and limitations within the contexts of sociology and architecture.

Functionalistic roots and commitment to efficiency

Despite their theoretical differences, UD and Functionalism share some common ground in their commitment to functionality and less attention to decorative elements in favour of designs for the human that fulfil practical and functional purposes. The paradigms emphasise a "rational design process". In Functionalism, rationality manifests through standardised designs and methods, such as Le Corbusier's 'Modulor' and 'Neufert' by Ernst Neufert or Klint's standardisations, as exemplified in the analysis of the archival material. These design standards become dominant in relation to how the body is imagined, conceptualised, and taught in education. In UD, rationality involves systematically addressing the spectrum of human variation and disability. In this sense, UD can be viewed as a shift from Functionalism, where functionality is redefined to include social inclusion and human diversity as a fundamental aspect of design.

Both UD and Functionalism share a commitment to efficiency. Functionalist architects and designers aim to design buildings, environments, and products that serve clear, utilitarian purposes. Similarly, UD focuses on creating products, programs, services, and environments that efficiently serve the needs of a diverse population. While Functionalism emphasises efficiency, productivity, and the fulfillment of predetermined functions, it often fails to account for the diverse needs of people. Functionalism can inadvertently exclude individuals who fall outside the normative conceptions of the body conceptualised by architects and designers. As argued by Gissen (2023); "What I call a 'functional' or 'functionalist perspective' has a history that precedes accessible design concepts: it describes beliefs that buildings

should represent essential physical capacities and activities." UD, on the other hand, challenges normative conceptions of the "average"; instead of optimising designs for efficiency alone, UD prioritises equity and usability for a diverse population. As stated by architects Steinfeld and Maisel (2012); "Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness and social participation." So, while Functionalism tends to adopt a mechanistic view of design, focusing on mass production and optimising environments, systems, and processes. UD, in contrast, adopts a more human-centered approach, often considering the lived experiences and everyday challenges of people, particularly those who have historically been marginalised and excluded in society, e.g. disabled people.

The 'average'

Both Functionalism and UD contain and propagate a specific normativity. Functionalism emerged in response to the societal and social changes and challenges of industrialisation, seeking to address issues such as poor living conditions and inefficient urban planning. Similarly, UD arose from a recognition of the exclusion faced by marginalised people and the need for more equitable products, programs, services, and environments. UD is further driven by principles of human rights, reflecting aims to foster inclusion, equity, and social justice. Functionalism, while progressive in its time, is primarily concerned with technological progress, industrial efficiency, and mass production. The result is that UD tends to produce more humane and adaptable spaces, whereas Functionalism may produce efficient, but sometimes exclusionary spaces. In that sense, UD represents both a continuation and a shift from Functionalism. It builds on the functionalist commitment to functionality and efficiency, but expands these principles to include a broader and more diverse range of people. By prioritising usability, flexibility, and human-centered design, UD addresses the limitations of Functionalism – particularly its tendency to focus on the "average human" and "fixed solutions". Therefore, UD can be seen as a progressive evolution of Functionalism, one that aims to align with contemporary societal values of inclusion, equity, and social justice.

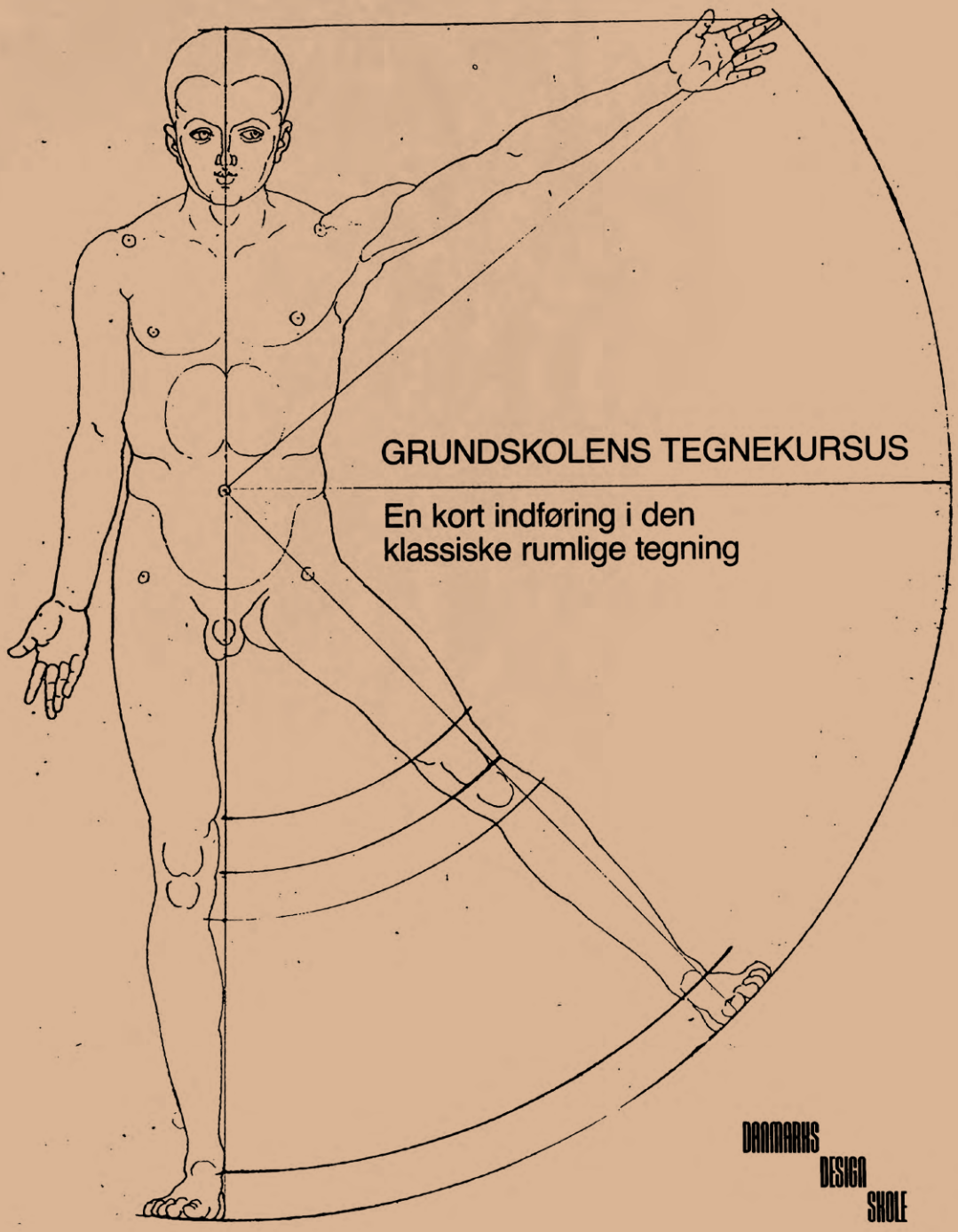


Figure 5 This image depicts the cover of the foundational teaching in drawing from Danish Design School dated to 1994. It represents a line drawing of the human body as outlined on a dark background in a geometric and anatomical style, divided by lines and arcs that emphasise symmetry and proportion. The extended pose and integration with circles suggest a focus on classical spatial drawing techniques and the body's role in teaching fundamental design principles. Reminiscent of historical ideals, it refers back to The Vitruvian Man by Leonardo da Vinci from the 15th century and other non-disabled male standardisations. Photograph by the authors.

Critiques

However, UD may still be subject to some of the same criticisms as Functionalism. While UD emphasises inclusion, equity, and social justice, it also shares methodological and philosophical traits with Functionalism, which makes it vulnerable to similar critiques.

First, Functionalism has been criticised for producing cold, monotonous mass solutions that prioritise functionality and efficiency over aesthetics, cultural heritage, and tactility. This approach may result in designs that lack diversity and emotional appeal, making them feel impersonal, alienating, and dehumanising. Similarly, UD, in its effort to accommodate the widest range of people, risks creating designs where functionality, accessibility, and standardised solutions overshadow design variations, which may lead to generic, clinical, or institutional designs and spaces. However, in recent years UD has also proven to foster spatial practices centering tactility and diverse ways of sensing architecture and design, as emphasised by scholar Camilla Ryhl (2024).

Second, Functionalism often relies on the authority of architects and planners, leading to a top-down approach that often silences the voices of marginalised people. Even though UD aims to be inclusive, the design process can still be dominated by non-disabled experts who dictate what constitutes accessibility and usability. If the direct knowledge from disabled experts is limited, the resulting designs may not reflect the diverse perspectives.

Third, both UD and Functionalism are underpinned by a normative framework that conceptualises human participation and contribution – such as engagement in the educational system and labour market – as fundamental to societal reproduction, stability, and efficiency.

Persisting ideals

Neither paradigm critically examines the foundations of this normativity; why is participation, inclusion, and contribution inherently desirable? What assumptions underlie such ideals, and for whom are they beneficial? While UD can be understood as both a critique of and a progression beyond Functionalism, it similarly often fails to interrogate dominant societal ideals, such as the notion of the

"productive human", as also exemplified in the analysis of the historical material. By implicitly aligning with these ideals, UD risks perpetuating normative assumptions about human values being tied to productivity and individual contribution, without providing scientific or philosophical arguments to justify their legitimacy. This potential uncritical adoption exposes a blind spot within UD, where inclusion and participation are treated as self-evidently positive goals, rather than constructs shaped by for instance specific socio-economic and cultural contexts. This raises a fundamental question; does UD merely address surface-level symptoms – such as lack of participation, contribution, and inclusion – without engaging with the deeper, ontological structures of society? By focusing on outcomes rather than causes, UD risks overlooking the generative mechanisms that produce exclusion and marginalisation, such as systemic economic inequality rooted in capitalism. In this sense, UD may inadvertently confine itself to "symptom management" rather than interrogating the structural conditions that underpin these very symptoms. Put differently; is it truly programmes, products, environments, and services that exclude people, or is exclusion a result of a capitalist system that incentivises developers, architects, and designers to prioritise economic efficiency over equity and social justice? Probably both. By adhering to what is perceived as economically advantageous, the structures of exclusion are reproduced rather than dismantled. This critique underscores a potential limitation of UD and how it might be taught in education; its focus on practical and technical solutions risks leaving unchallenged the historical roots and systemic forces – such as economic inequality and capitalism – that fundamentally are part of shaping societal design and human inclusion.

Conclusion

Based on the analysis in this chapter, this study suggests that UD represents both a shift from and an extension of Functionalism. To address the critiques outlined, UD must expand its focus beyond eliminating visible barriers to inclusion and actively challenge the deeper structural inequalities and power dynamics that sustain exclusion and marginalisation. While UD seeks to rectify the shortcomings of Functionalism, it is not immune to similar critiques. How the evolving paradigm of UD will respond to these

challenges remains an open question. However, ensuring that UD engages critically with its own theoretical and practical foundations is essential for its continued relevance – particularly in relation to the development of pedagogies and its application in architectural and design education. Moving forward, this requires systematic examinations of UD's roots, a recognition of its potential shortcomings, and an exploration of future pathways for its development.

What does it take to move from universal design principles to practice, creating real social impact? Section 3 turns to this question by exploring how UD requires more than principles to be operationalized – it demands a shift towards more inclusive mindsets in order to create change within lived, complex contexts. This section also presents practice-oriented case studies situated in educational and participatory environments.

Chapter 6 builds on a scoping review and interviews with design and engineering educators to conceptualize Inclusive Mindset as an internal mechanism that drives inclusive behaviour across various contexts, including UD. This chapter highlights actionable strategies for embedding inclusivity into practice, such as norm-critical reflection, participatory co-creation, and systemic support for inclusive behaviours. It also expands UD understandings to include diverse dimensions of identity, such as gender, race, culture, and socioeconomic background.

Chapter 7 examines how a large-scale Danish music festival such as the Roskilde Festival can serve as an experimental site for fostering inclusive mindsets in design education. By integrating universal design principles into students' projects at Roskilde Festival, the chapter explores how temporary urban environments can function as "living laboratories" for inclusive design education. Students engage in co-creation workshops, develop physical prototypes, and use virtual reality (VR) simulations to understand and address real-world accessibility challenges.

Chapter 6 Inclusive Mindsets as a Tool for Change: Advancing Universal Design

Akrimar Tongakaew, John Paulin Hansen, Dagný Valgeirsdóttir

"The growth of Universal Design is ultimately a shift in culture – one that begins with a shift in mindset"

Universal Design (UD) offers a guiding principle for creating products, services, and environments that are accessible and equitable for all. In practice, however, UD is often treated as an afterthought, limited to addressing accessibility requirements or fulfilling specific project briefs (Holmes 2018; Tatara & Giannoumis 2017). Therefore, achieving UD requires more than design tools and methods – it demands a shift in mindset that prioritises diverse users not just in design decisions, but in broader organisational practices, policies, and cultural norms.

However, this mindset remains vaguely defined. It is often described in broad terms – as valuing diversity, supporting inclusivity, or holding certain beliefs. Without a clearer understanding of what this mindset entails, how can we advocate for it effectively? To address this gap, we introduce the concept of an Inclusive Mindset – an internal mechanism that drives inclusive behaviour across various contexts, including UD. This chapter builds upon insights from a scoping review of 47 studies and subsequent interviews with design and engineering educators to present the Inclusive Mindset Model (Tongkaew et al., in press). The model identifies influencing factors, core components, and resulting behaviour of an inclusive mindset.

This model provides a practical framework for understanding and fostering inclusivity across diverse domains, from architecture and industrial design to digital technologies, policymaking, media, and education. It also highlights UD's potential beyond disability, emphasising its role in fostering inclusion across various diversity dimensions. Understanding the components of an inclusive mindset enables practitioners to integrate inclusivity proactively and intentionally into their work. Moving beyond theory, this chapter offers

actionable insights for fostering this shift in mindset and leveraging it to advance UD and drive meaningful societal change.

What is an Inclusive Mindset?

Inclusion refers to ensuring that all individuals, regardless of background, identity, or ability, have equitable opportunities to participate fully in society. The United Nations Department of Economic and Social Affairs (2016, p. 20) defines social inclusion as "the process of improving" the terms of participation in society for people who are disadvantaged on the basis of age, sex, disability, race, ethnicity, origin, religion, or economic or other status, through enhanced opportunities, access to resources, voice and respect for rights

UD emphasises that inclusion extends beyond accessibility compliance. It is about proactively fostering equity, dignity, and meaningful participation in the built environment, digital spaces, and social interactions. UD also invites us to challenge exclusionary norms and systems to create solutions that benefit all users, rather than adapting existing systems for a select few.

However, inclusion does not happen automatically – it is shaped by the mindsets of those who create policies, spaces, systems, and communication. To better understand how mindsets drive inclusivity, Tongkaew and Lomberg (2024) propose an Inclusive Mindset Model as a conceptual framework for understanding and fostering an inclusive mindset.[1)] The updated Inclusive Mindset Model → Figure 1 is then adjusted based on insights from interviews with design and engineering educators and authors' reflections.

According to the model, an inclusive mindset consists of five main elements: openness, awareness, empathy, attitude, and motivation. These components work together, reinforcing one another to drive inclusive decision-making and action.

Openness or open-mindedness is a willingness to consider diverse perspectives, values, and beliefs that may challenge one's own (Price et al. 2015). It is the most referred quality of an inclusive mindset in both the scoping review and interview. This openness also involves curiosity in learning

1) The model is developed based on a scoping review of 47 papers that discuss an 'inclusive mindset' concept, supplemented by expert interviews for refinement and validation.

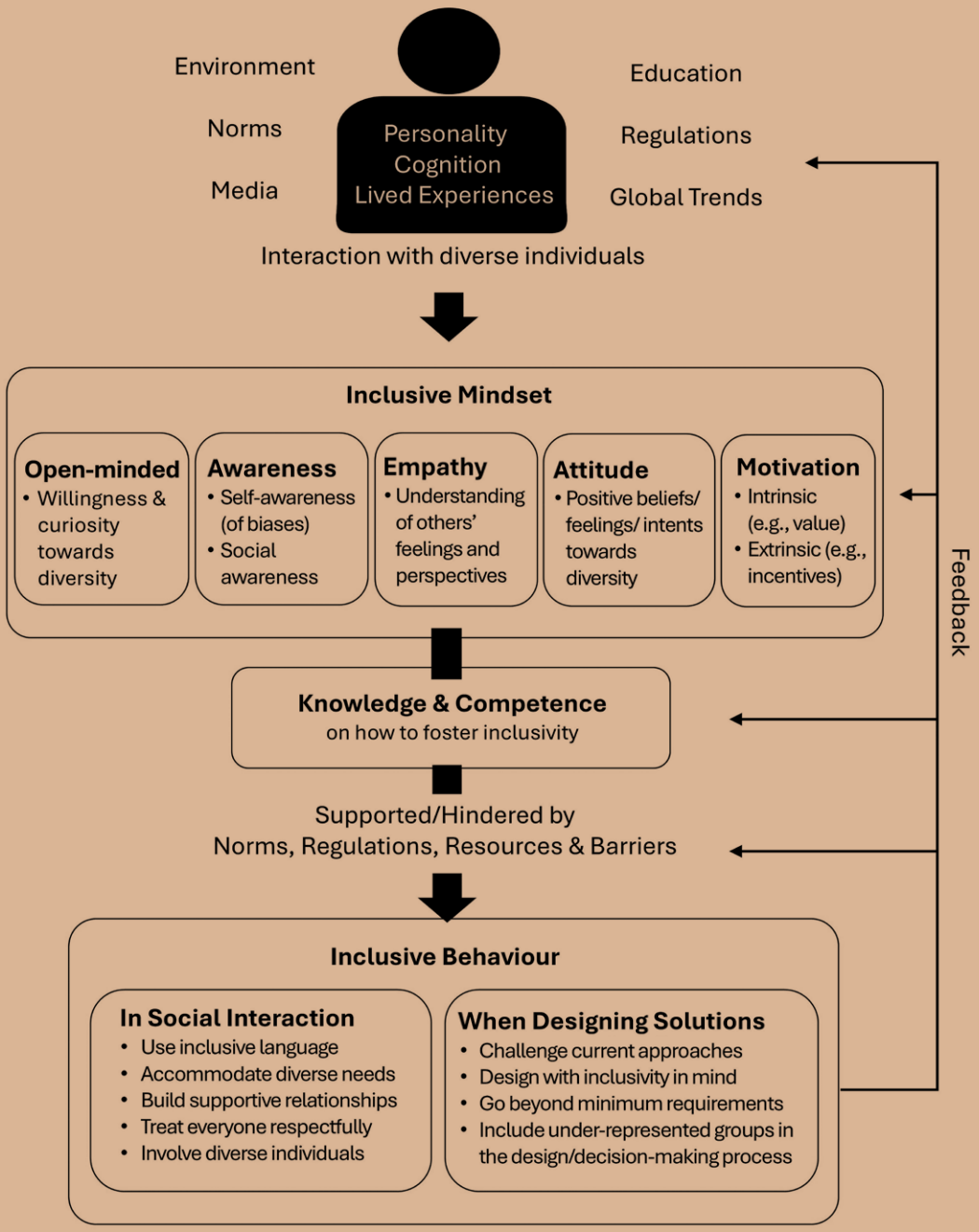


Figure 1 An Inclusive Mindset Model (Tongkaew et al., in press)

about differences (Bosio 2023; Forsberg 2022) and willingness to explore alternative options (Weaver 2002).

Awareness is central to an inclusive mindset as it enables individuals to critically examine how their perspectives influence inclusion. It consists of two key components. Self-awareness involves reflecting on one's own biases, privileges, and assumptions, as well as understanding how personal actions and decisions impact diverse individuals (Nezafati et al. 2022). Meanwhile, social awareness entails recognising systemic barriers that contribute to social exclusion and understanding their impact on different groups within society (Nezafati et al. 2022).

Empathy refers to the ability to recognise, connect with, and appreciate the emotions, perspectives, and lived experiences of others (Rogers 1959). Empathy fosters compassion and helps individuals build meaningful relationships with people from diverse backgrounds and abilities. It can serve as emotional reason to change towards inclusion (Altinier et al. 2022).

Attitude shapes how individuals perceive and respond to diversity. It is a personal evaluation towards someone or something and consists of three main components – cognitive, affective, and behavioural (Eagly & Chaiken 1998). Thus, an inclusive mindset encompasses positive beliefs, feelings, and behavioural intentions towards diversity and individuals from different backgrounds and abilities.

Motivation determines whether mindset translates into action. It comes from two main sources. Intrinsic motivation stems from within individuals, such as how they value inclusion and diversity, leading to genuine openness to learn and embrace differences. In contrast, extrinsic motivation is encouraged by external factors such as organisational incentives, regulatory requirements, or societal expectations. An inclusive mindset often requires a combination of both, where personal conviction aligns with external reinforcements.

Therefore, an inclusive mindset is a combination of openness, awareness, empathy, attitude, and motivation that supports meaningful participation for diverse populations. This definition builds on the UN's concept of social inclusion but broadens the focus from 'disadvantaged groups' to

'diverse populations.' This shift acknowledges the complexity of intersectionality, where individuals may experience both privilege and marginalisation, and avoids framing people solely through disadvantage. Instead, an inclusive mindset empowers individuals to recognise diversity as a source of strength and support reciprocal relationships.

From Mindset to Action

An inclusive mindset lays the foundation for inclusive behaviour, but whether individuals will translate their mindset into inclusive behaviour or not, depends on multiple factors. The Theory of Planned Behaviour (Ajzen 1991) suggests that intention is a key determinant of behaviour. Yet, even when individuals are motivated, they may not act inclusively if they lack the confidence, skills, or authority to do so.

A key enabler in this process is knowledge and competence. Whereas mindset reflects how individuals orient themselves toward diversity, knowledge and competence equip them with the tools to act accordingly. This includes both factual understanding (e.g., knowledge of UD principles) and practical skills (e.g., how to co-create solutions with under-represented users). Without this foundation, even well-intentioned individuals may feel unprepared to take inclusive action. For instance, a designer may feel empathy toward users with disabilities, but without inclusive methods, their solutions may unintentionally exclude. In this way, knowledge and competence bridge the gap between intention and impact.

Beyond individual capacity, external conditions also shape whether inclusive behaviour is supported or hindered. Factors such as social norms, regulations, resources, and barriers can either reinforce or inhibit inclusive action. For example, a designer working in a team that values co-creation and allocates time for community engagement is more likely to enact inclusive practices. Conversely, rigid timelines and a lack of management support may prevent motivated individuals from engaging in inclusive design.

Then, inclusive behaviours can manifest both in social interactions and when designing solutions. In interpersonal contexts, inclusive behaviour involves fostering respectful

and supportive relationships with people from different backgrounds and abilities. This includes using inclusive language that acknowledges people's strengths without reinforcing stereotypes, being flexible to accommodate diverse needs, and ensuring that all individuals feel valued in group settings. Treating others with respect, regardless of their background or abilities, is a fundamental aspect of inclusivity. Additionally, proactively engaging with people with different backgrounds, identities, and abilities – whether in conversations or in social groups – helps challenge biases, build empathy, and foster intergroup collaboration.

In design practices, inclusive behaviour is reflected in how products, services, and environments are created to benefit the widest range of users. This requires questioning conventional approaches and assessing whether existing norms and standards perpetuate exclusion. It also involves designing with inclusivity in mind by considering the diverse needs of all stakeholders and going beyond minimum requirements. A key aspect of this process is involving a broad range of stakeholders, including underrepresented and marginalised groups, as active collaborators in decision-making. Through co-creation and participatory design methods, designers can integrate diverse perspectives to shape more equitable and effective solutions.

What shapes an Inclusive Mindset

An inclusive mindset is not innate. It develops through ongoing interactions between personal characteristics and external influences. While previous sections focused on the components of an inclusive mindset and how it drives behaviour, it is equally important to understand how this mindset is formed in the first place.

External factors establish the broader social and structural conditions that shape an inclusive mindset. The environments in which individuals grow, live, and work significantly influence how they approach diversity. Supportive settings that encourage curiosity, dialogue, and collaboration make individuals feel safe to express and engage with diverse perspectives (Chitra & Chandra 2017; Prasad et al. 2019). Conversely, environments that promote conformity or reinforce bias can suppress inclusive thinking (Brooks & Strunc 2022).

Social norms, embedded in these environments, shape expectations around how people respond to diversity. For instance, the societal shift to view disability as a result of environmental barriers instead of personal impairment has driven significant progress in inclusive design (Clarkson & Coleman 2010). However, outdated narratives in media, such as the protagonist in *Me Before You* choosing death over disability, may reinforce negative stereotypes that disability is a burden.

At the same time, positive global trends toward diversity and inclusion are challenging exclusionary norms and prompting institutions to adopt more inclusive practices. These trends are supported by leading institutions and companies, such as the UN Convention on the Rights of Persons with Disabilities and Microsoft's Inclusive Design initiative. Regulatory frameworks, including accessibility standards, also encourage individuals and organisations to engage with inclusion more deliberately.

Education is one of the most common ways to foster both an inclusive mindset and knowledge. For instance, implicit bias training aims to raise awareness of unconscious attitudes (Owen 2021). Meanwhile, ability prompt cards developed by Valgeirsdóttir (2021) use different (dis)abilities as a constraint to challenge designers to create a more inclusive solution.

Direct interactions with people from different backgrounds and abilities can break down stereotypes, foster empathy, and promote deeper relationships (Cohen Carrus 2017; Kopmann & Zeinz 2018). Close relationships with individuals who are affected by biases can also strengthen one's motivation to act inclusively (Nezafati et al. 2022; Zallio & Clarkson 2021). Yet, these interactions enhance an inclusive mindset only when they are positive. Negative experiences can reinforce harmful stereotypes instead of breaking them down (Paolini et al. 2010).

While external factors shape the broader context for developing an inclusive mindset, internal factors influence how individuals engage with these experiences and integrate them into their worldview. Personality traits influence how individuals engage with diversity and inclusivity. Traits such as openness to experience, curiosity, and sensitivity shape one's

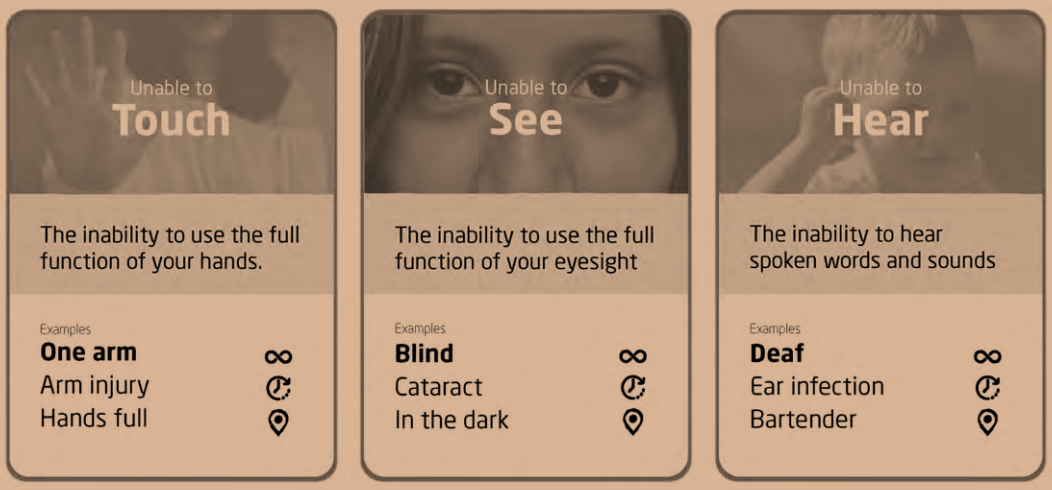


Figure 2 Example of Ability Prompt Cards

willingness to embrace different perspectives (Ashton-Hay & Williams 2023; Bradford et al. 2021; Forsberg 2022).

Furthermore, cognition shapes how individuals process, interpret, and apply knowledge about inclusivity. Cognitive flexibility, or the ability to shift perspectives and adapt thinking based on new information, allows individuals to reconsider assumptions and embrace different viewpoints. Similarly, critical thinking skills enable individuals to analyse systemic barriers and question exclusionary norms, fostering a deeper commitment to inclusive behaviour.

Lived experiences, including demographic identity, shape how individuals perceive and engage with inclusivity. Those with marginalised backgrounds may develop a heightened awareness of social barriers through personal experience, while those from privileged backgrounds may require structured learning to recognise systemic inequities.

Together, these factors shape the development of an inclusive mindset. Recognising this interplay is essential for fostering inclusion at both individual and systemic levels. This understanding highlights the need to intentionally design environments, systems, and communication that actively cultivate inclusive thinking and behaviour.

The Feedback Loop

Inclusive behaviour is not the end-point of the process but part of an ongoing feedback loop. Positive experiences, such as improved relationships, successful collaboration, or external recognition, can reinforce inclusive behaviours and strengthen the underlying mindset that supports them. Conversely, negative experiences such as resistance, lack of support, or unintended consequences may cause individuals to question their approach or disengage from inclusive practices. However, such setbacks can also serve as learning opportunities, prompting reflection that leads to deeper insight into how inclusion can be practised more effectively.

Engaging in inclusive actions often builds knowledge and competence. Through practice, individuals develop a deeper understanding of inclusivity and become more confident in applying inclusive methods. This growth, in turn, feeds

back into the mindset itself, enhancing awareness, shifting attitudes, and reinforcing motivation.

Therefore, engaging in inclusive behaviour is never a lost cause, even when the outcomes are not immediately successful. Each effort contributes not only to personal learning but also to shaping a more inclusive environment – whether through evolving social norms, improved practices, or policy change.

Inclusive Mindset Model as a Tool for Change

The Inclusive Mindset Model offers a practical framework for advancing Universal Design (UD) by guiding individuals and organisations in fostering inclusivity across social interactions and design practices.

Educating an Inclusive Mindset

To effectively persuade individuals or organisations to engage with or advocate for UD, we need to address one or more elements of an inclusive mindset. Openness can be nurtured by encouraging curiosity and non-judgmental exploration. Awareness grows through self-reflection that helps individuals recognise their biases, assumptions, and the broader societal issues affecting underrepresented groups. Empathy can be deepened through personal stories, immersive simulations, or direct interactions with those affected by exclusion.

Attitude is influenced by how we frame diversity – as a challenge, or as an opportunity. Educators can help shift perspectives by highlighting the value of inclusion and the strengths of diverse teams. Motivation can be encouraged when the benefits of engaging in inclusive practices are clear. So, UD should be framed not as a matter of social justice or a solution for specific groups, but as a pathway to improved usability and innovation for all.

Critically, knowledge and competence must be built to ensure individuals not only want to address inclusivity issues but also know how to do so. Active listening, perspective taking, and effective communication are key competencies for inclusive social interaction. Meanwhile, the knowledge and skills around UD principles, co-creation, and user research are essential for designing inclusive solutions.

Since the five mindset elements are interdependent and closely linked to knowledge and competence, effective learning programmes should target multiple components at once. A practical example comes from the value-sensitive design intervention by Nezafati et al. (2022). In their approach, students were guided to reflect on non-inclusive designs and their implications for themselves or the people they care about. This reflective process led them to discover the underlying biases and assumptions. It was then followed by a redesign exercise where students applied inclusive design principles to improve these flawed solutions. This intervention seamlessly combined raising awareness, fostering empathy, and imparting technical knowledge, illustrating how multiple elements of an inclusive mindset can be integrated into learning experiences.

Furthermore, an inclusive mindset model can serve as a guideline for designing and evaluating learning interventions. Educators and facilitators can use the model to identify which elements of an inclusive mindset the intervention seeks to address and whether they succeed in doing so. Moreover, the model's behavioural outcomes provide a practical benchmark for evaluating the effectiveness of interventions. By identifying the kinds of behaviours they expect students or design practitioners to perform – such as involving diverse stakeholders or designing beyond minimum accessibility standards – the model helps align learning goals with real-world outcomes. This dual focus on mindset and behaviour ensures that interventions are not only theoretically grounded but also result in meaningful, measurable changes in practice.

Beyond Learning Interventions: Fostering Inclusive Behaviour in Design Practice

While learning interventions are among the most popular methods to foster an inclusive mindset, they are not the only way. The Inclusive Mindset Model highlights that factors including social norms, environments, and interaction with diverse individuals also play a crucial role in shaping inclusive mindsets and behaviours. By addressing these factors, organisations and individuals can create systems and practices that support inclusivity beyond the classroom.

Societal norms, in particular, dictate expectations around inclusion and thereby influence behaviours. For instance,

Kille-Speckter and Nickpour (2022) illustrate how societal attitudes toward disability have evolved, transforming design practices over time. During the Industrial Revolution, disability was primarily seen through a medical lens, leading to the creation of assistive devices aimed at fixing impairments. This perspective evolved post-war as returning disabled veterans pushed disability into the realms of social welfare and civil rights, catalysing the implementation of accessibility standards. More recently, a shift towards viewing disability as a result of societal design flaws has reframed inclusivity in design, aligning with the global trend of an ageing population and the rise of UD principles.

However, while inclusive norms are emerging in many areas, exclusionary norms remain deeply embedded in many aspects of society, often without question. Therefore, we need to train ourselves and our students to be norm-critical – to actively evaluate the norms embedded in our environments, communications, and the solutions we create. This involves questioning which norms are being exhibited, who they benefit, and who they exclude or oppress. At the same time, we must also take an active role in creating new inclusive norms. For example, the shift in terminology in discourse – from impairment and treatment to accessibility and diversity – has reframed conversations about inclusion, emphasising empowerment rather than limitation (Kille-Speckter & Nickpour 2022).

Furthermore, environments in which designers work and learn also play a vital role. One actionable step is for organisations to assess their internal culture: Do employees feel empowered to challenge exclusionary norms? Are there mechanisms in place to ensure diverse perspectives are heard and valued? Creating workplace policies that actively support inclusion, such as diverse hiring practices and mentorship programmes for underrepresented groups, helps cultivate an environment where an inclusive mindset can translate into sustained action.

Another practical way to create inclusive environments is by increasing diverse representation in the design field itself. Drawing on Allport's optimal contact conditions (1954), research shows that meaningful intergroup interactions – characterised by equal status, shared goals, and institution-

al support – can reduce prejudice and promote empathy (Pettigrew & Tropp 2006). By attracting underrepresented populations into the design workforce, organisations not only diversify perspectives but also cultivate natural opportunities for challenging biases and fostering innovation.

Furthermore, fostering inclusive behaviour requires ongoing reinforcement through supportive structures and reflective practice. While an inclusive mindset provides the foundation, external factors such as policies, institutional norms, and available resources shape whether inclusive behaviours are adopted and sustained. Regulatory frameworks and organisational cultures can either enable or hinder these efforts, while feedback loops play a crucial role in strengthening or weakening inclusivity. Positive reinforcement, such as successful UD implementation or increased stakeholder engagement, motivates continued inclusivity, whereas barriers or resistance may prompt reassessment and refinement.

In essence, the Inclusive Mindset Model offers a valuable framework for navigating this complex interplay between mindset, action, and external factors. By addressing the broader systemic influences of societal norms, environments, and diverse interactions, organisations can move beyond temporary interventions to create lasting, systemic change. Advancing UD requires intentional effort, ongoing adaptation, and the commitment to translate inclusive mindsets into transformative actions.

Concluding Reflections: Advancing Universal Design

The Inclusive Mindset Model offers a practical and reflective framework to support Universal Design (UD). By outlining how internal dispositions, knowledge, and external factors interact to shape inclusive behaviour, the model helps individuals and organisations take concrete steps toward more equitable design practices.

While the ultimate goal of an inclusive mindset is to be universal – fostering inclusivity for all – it is important to recognise that, in practice, individuals may exhibit an inclusive mindset towards certain groups while holding biases against others. For example, someone may advocate

for disability rights yet overlook the needs of racial, religious, or gender minorities. Recognising these blind spots is essential for self-reflection and growth.

In design practice, it is often necessary to focus on specific target groups to ensure their needs are properly addressed. At the same time, fostering an inclusive mindset requires recognising the interconnected nature of identities (i.e., intersectionality). Intersectionality reminds us that individuals' experiences are shaped by overlapping aspects of identity, such as gender, disability, race, or socioeconomic status. For example, a wheelchair user from a low-income background may face not only physical accessibility barriers but also financial constraints and societal stigma around poverty. An inclusive mindset must consider these combined aspects to address the full diversity of human experiences.

As such, while disabilities have traditionally been the central focus of UD, expanding its scope is critical. Design practitioners often acknowledge the importance of addressing other diversity dimensions, yet they frequently find the process abstract and challenging (Lamirande et al., 2022). This challenge may arise from the limited availability of tools and frameworks that explicitly address non-disability-related inclusivity. While established design methodologies such as UD, inclusive design, and human-centred design are inherently adaptable, their application often remains narrowly focused on physical accessibility and disability.

Expanding UD to embrace the full diversity of human experiences requires reimagining these tools and approaches. For instance, integrating co-creation processes with individuals from varied backgrounds and identities can provide designers with nuanced insights into the needs and preferences of different user groups. Co-creation not only enriches the design process but also empowers underrepresented voices by ensuring they play an active role in shaping solutions (Sarmiento Pelayo, 2015).

Ultimately, moving beyond disabilities does not mean diminishing their importance but rather recognising that true inclusivity encompasses all aspects of diversity. By addressing the broader dimensions of inclusivity, UD can fully realise its potential as a transformative framework for

creating equitable and accessible solutions that benefit everyone, regardless of their background, ability, or identity.

More broadly, cultivating an inclusive mindset – through education, reflection, interaction, and systemic support – is essential to realising the full potential of UD. By embedding inclusive ways of thinking into how we design, collaborate, and lead, we can create more equitable solutions and more inclusive societies.

Chapter 7

Leveraging Festivals to Nurture Inclusive Mindsets in Design Education

Ole B. Jensen, John Paulin Hansen, Dagný Valgeirsdóttir

Introduction

Understanding how the music festival Roskilde Festival might nurture an inclusive mindset, we take a point of departure in the pragmatic and design-oriented part of the so-called 'mobilities turn' (MT, Jensen 2015; Urry 2000). MT is concerned with the importance of bodily movement and sensations to problematise that transportation simply is about relocating things, vehicles, and bodies from point A to point B. Within the MT framework it is illustrated that the way we move – or are being prevented from doing so – deeply affects who we are, how we relate socially to others, and how we understand the material world around us. Put in short terms, mobility affects *identity, sociality, and materiality* (Jensen 2013). It is on this background that MT has coined its key statement that 'Mobility is more than A to B' movement. The ways in which we inhabit urban spaces and infrastructural landscapes of the contemporary city can therefore be said to have deep repercussions for us. This goes if we are commuters by public transport or car or when we are exploring the city on foot. This also becomes important if we have issues with moving or utilizing any of the artefactual landscapes that have become second nature to us.

People with challenges related to their cognitive or bodily capacities face specific hurdles related to mobility. Moreover, there might be social dimensions such as resources or knowledge that privilege certain groups against others. Hence there are issues of 'mobility justice' (Sheller 2018) to be included. Besides exploring how mobility systems may be socially unjust in their configuration, the mobility justice framework from Sheller foregrounds the key issue of 'who counts as a person?' (p. 39).

This connects to the universal design perspective deepening the accessibility question to address much more than how to go from A to B. Creating a universal design solution to mobility is to materially respond to who counts as a

person. The ways in which we negotiate the built environment with our bodies suggest that we are deeply relying on the configuration of the materiality. Hence the design of spaces, technologies, and infrastructures becomes key in understanding what we may or may not do within these frames. The 'mobility design' (Jensen & Lanng 2017) reaches beyond transport and deeply into how we may live as humans. In this paper, the mobility design of festival facilities is our prime case.

The ways in which mobility design shapes the environment creates specific 'mobility affordances' (Jensen 2013, p. 120) and these are always relationally configured. Instead of understanding the human body as dislocated and separate from the built environment we might see it as 'immersed' and relationally intertwined and entangled. Elsewhere, this has been described through terms such as 'extended bodies' and 'elastic situations' (Jensen 2021). The point is that we need to understand the nestedness of the moving bodies into the technologies and infrastructures.

The pragmatic features of the spaces where we 'do mobility' are then key in understanding how mobile practices are enabled or prevented. Here the 'mobile situation' (Jensen 2013) is at the centre of attention. A mobile situation is analytically composed by a material, a social, and an embodied dimension. → Figure 1 An example could be that when an individual crosses a street, the individual does so in a material environment, potentially in interaction with other mobile bodies (some of whom might be nested into vehicles), and this action would be categorized as an embodied practice. Therefore, it can be stated that the individual sees, feels and senses when in that mobile situation. However, some elements of the mobile situation have been pre-determined elsewhere, or 'staged from above'. For example, the width of the street or the speed limits governing the actual sites. There are also elements related to decisions and acts directly dependent on the individual in the situation. For example, the decision to cross the road or to ask a fellow guest at a festival for the location of the nearest toilet. These are situationally determined, or 'staged from below'.

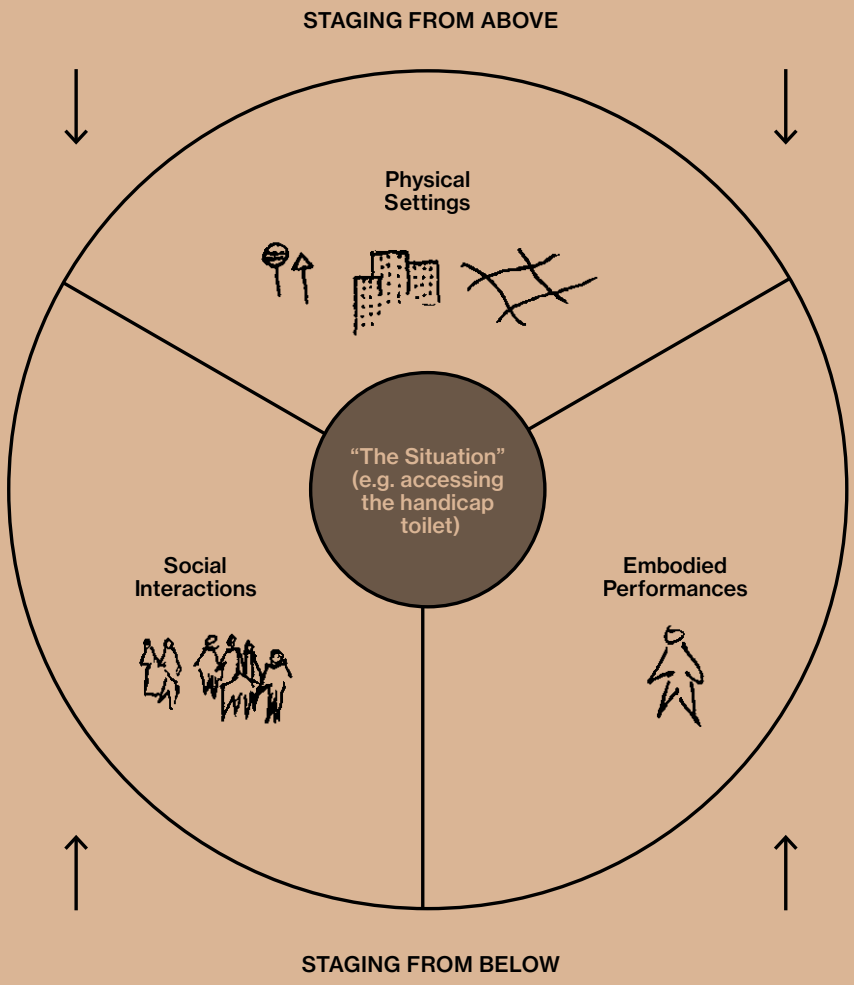


Figure 1 *Staging Mobilities* (modified from Jensen 2013:7)

In sum, a mobile situation is a composition of materiality, sociality, and embodiment. Moreover, it is either predetermined through choices and decisions made elsewhere (in planning offices, boardrooms, or design studios) as well as it is situationally staged by the individual as an autonomous agent. If we apply this model to mobile situations we understand how we are related to the built environment but also why it makes sense to see us as much closer related than as a separate body standing against a material space. Such Cartesian perceptions are crude and unhelpful models for understanding mobile situations. The model moreover makes clear that the mobile situations are mediated by materialities and hence that the mobile affordances are created through *mobility design*.

We sense the mobilities of the everyday life-world through more than rational and calculative registers (e.g. shortest distance, fastest route, cheapest fare). Rather, we feel desires, anxiousness, loathing, attraction and a host of other sentiments (Elliott & Urry 2010). This also goes for the ways in which we understand our options for movement as something related to justice. Elsewhere, Jensen (2026) has argued that as mobile creatures we are sensing 'mobility injustice' and in particular that this may be experienced as an effect of design (ibid.). For instance, a festival guest who cannot access a toilet by wheelchair will rightly consider this as "unfair" design.

From this perspective we find useful pointers to understand what is going on when users are moving through a festival space. Moreover, we suggest that part of this understanding may also be gained when people are immersed into VR applications simulating such mobilities – even though there may be missing registers at play in VR compared to the real-life situation.

With a MT perspective on mobilities design we are arguing for a sensitivity to choices made by the individual based on more-than-rational bases. These are also sensed and emotional registers. We also suggest that the designers – broadly spoken – have made decisions with repercussions for the mobile individual. The mobility affordances created by the specific ways in which the built environment is laid out furthermore suggest that we should pay attention to

mobility justice and mobility injustices. This is always the case. However, we want to pay special attention to this dimension when it comes to mobile humans that are challenged in one capacity or the other. We connect these insights to critical disability studies (Dokumaci 2023; Gissen 2022; Hendren 2022) as well as to the agenda within universal design (Frandsen et al. 2023; Ryhl 2024).

The upcoming sections explore the potential of music festivals as experimental spaces for cultivating an inclusive mindset by implementing universal design principles among design students. Drawing on the concept of festivals as 'urban laboratories' with the Roskilde Festival as our case, we propose an innovative approach to educating future designers about inclusive practices and accessibility. At festivals, students can examine how design decisions impact the mobility and experiences of individuals with cognitive and physical challenges in complex, temporary urban spaces. We argue that this immersive, experiential learning method can help bridge the gap between theoretical knowledge of universal design and its practical application, addressing both invisible attributes (e.g., open-mindedness, awareness of biases) and visible attributes (e.g., designing with accessibility in mind) of an inclusive mindset. By engaging students in real-world festival accessibility challenges, we aim to foster a deep sense of material awareness and empathy, challenging the misconception of design as inherently benevolent and inclusive. Our approach applies co-creation workshops, physical prototypes (mock-ups), digital simulations (i.e., virtual reality (VR)), and artistic interventions to enhance students' understanding of accessibility challenges in complex environments.

This research contributes to ongoing discussions about the role of design in promoting social inclusion and justice in urban spaces, by providing a teaching approach to identifying and nurturing the constructs of an inclusive mindset in design education.

Festivals as a Teaching Context

The integration of festivals into students' curricula demonstrates the transformative potential of co-creation and universal design (UD) methodologies in fostering an inclusive mindset among design and engineering students.

By immersing students in the vibrant and multifaceted context of a large-scale festival, course- and project activities encourage participants to address real-world accessibility challenges while engaging in collaborative problem-solving.

Design courses at Technical University of Denmark (DTU) are deeply rooted in the principles of universal design as an integral lens for cultivating inclusive practices. Universal design goes beyond accessibility, advocating for the creation of environments, products, and services that are inherently inclusive, serving the broadest spectrum of users without the need for adaptation. This perspective shifts the design focus from accommodation to empowerment, making inclusivity a proactive design ethos. The framework emphasizes a holistic understanding of UD, recognizing its visible attributes – such as physical accessibility – and its less tangible aspects, including open-mindedness, empathy, and awareness of biases. At its core, this methodology seeks to blend internal factors like motivation and understanding with external influences such as social expectations and cultural norms (ref. Tongkaew et al. in progress, Valgeirsdóttir, 2024).

The design projects and courses are organized to balance theoretical understanding with hands-on applications. It begins with foundational sessions introducing universal design and co-creation methodologies, grounded in examples of inclusive practices and real-world challenges. Early lectures set the stage by linking theoretical constructs to practical design considerations, highlighting how mobility and temporary spaces influence user experiences.

The course "Staging co-creation and creativity", led by one of the authors, has become popular among all groups of engineering students at DTU, attracting more than 100 participants each year. This course provides students with opportunities to engage in iterative design processes. Students collaborate to identify accessibility challenges within the festival environment and develop co-creative (Sanders and Stappers 2008) solutions. The use of tools such as boundary objects (Bergman et al. 2007) and design games (Brandt et al. 2008) foster an atmosphere of exploration and creativity, enabling students to address complex issues

through participatory methods. Reflection is integral to the process, with students documenting their learning and iterating on their designs after each workshop.

The workshops align with the "Double Diamond" framework (Design Council 2005), a structured design process that alternates between divergent and convergent thinking. This approach allows students to broaden their understanding of user needs before narrowing their focus to refine and prototype solutions. Students also engage directly with festival stakeholders, including attendees, volunteers, and organizers, to ensure their designs are grounded in authentic user insights. The presentations, evaluated by festival representatives and course instructors, emphasize the inclusivity, creativity, and feasibility of the proposed solutions. The iterative process of receiving feedback and refining designs mirrors real-world professional practices, preparing students for future challenges in universal design.

The Roskilde Festival offers a living laboratory for students to apply their learning in a real-world context. Its complex, high-pressure environment exemplifies the challenges of designing for inclusivity in temporary spaces. Students are tasked with addressing diverse issues such as improving physical accessibility, creating sensory-friendly zones, and fostering social inclusion. The festival is an annual event which has taken place for more than 50 years and attracts 100,000 guests for a weeklong music and cultural experience (Marling & Kiib 2011). Around 30,000 volunteers enable this, serving as organizers, builders, stagehands, food and drink servers, security assistants, and cleaners. The festival also facilitates the "Handicamp", a dedicated campsite for people with special needs. This area provides essential services to ensure a comfortable and inclusive experience for all guests. Special amenities include accessible toilets, electricity for recharging wheelchairs, and a range of tailored activities to make the festival enjoyable and engaging for camp guests. For instance, a co-creation workshop was held with Handicamp guests to address specific challenges faced at the festival, with a particular focus on improving toilet facilities (*cf. Section 2.2*). This collaborative approach allowed participants to share insights and solutions, leading to more informed upgrades to the camp's infrastructure. In parallel with this work, a VR model of a mobile,

accessible toilet was made to explore user experiences and accessibility issues. Section 2.3 will present more details on this work.

Student design projects with Roskilde Festival

DTU and Roskilde Festival have maintained a formalized partnership for more than 10 years under the title "Roskilde Festival Powered by DTU Students." This collaboration allows students to propose projects they would like to test at the festival. If their project is approved, they receive free access to the festival, where they are tasked with collecting data related to their project and presenting it at a dedicated exhibition stand, which the students staff themselves. Each year, approximately 100 students participate in this collaboration, which has a broad focus on sustainability, well-being, hygiene, food, entertainment, music, and, in recent years, universal design (Jensen et al. 2018).

In this section, we will summarize around 70 student projects that have incorporated a universal design perspective. Some of these projects have emerged from the co-creation course, and following the course several of them have been tested at the festival. The summary of the projects will be conducted using the MT framework introduced in the first section of this article.

The case study demonstrates how user studies can be implemented in a music festival such as the Roskilde Festival. However, it can be argued that similar activities could be implemented in other festivals. The demographic of Roskilde Festival consists of young adults, with a focus on individuals younger than 25 years of age, although people of all ages attend the festival. We believe that our approach may be implemented and conducted in festivals with older demographics and broader interest areas, however that would ultimately have to be determined by the purpose of the studies on a case-by-case basis.

Social interactions have been supported through design solutions that elevate individuals with mobility impairments to standing eye level, ensuring they can participate fully and equitably in event spaces. These solutions address the material dimension of mobility by overcoming height

barriers in physical spaces while responding to the social dimension by fostering a sense of inclusion rather than isolation. Some student projects designed adjustable and mobile ramps that allow users to remain integrated with the crowd rather than being relegated to separate spaces. Other projects explored foldable and supportive seating options to address the needs of individuals who require periodic rest while staying near their peers. Such solutions bridge the material and embodied dimensions by providing adaptable structures that reduce physical fatigue while facilitating social participation. A few designs also explored tools for communication and visibility, which enhance users' presence in crowded or noisy environments. These tools compensate for physical limitations while addressing the social need for recognition and interaction within event spaces.

Embodied performances have been a central focus of several projects, particularly through seating and navigation aids. Seating solutions, such as ergonomic seating systems or bar-integrated resting options, emphasize the embodied dimension by addressing physical strain and providing adaptable comfort that encourages prolonged engagement in social and cultural settings. For individuals with visual impairments, navigation aids like tactile guidance ropes and illuminated pathways were explored to improve spatial access. One project also tackled assistive drinkware solutions to minimize spillage for users with motor impairments. These tools ensure practical ease of use while aligning with the embodied experience of interacting with everyday objects in a way that avoids stigma. Other projects focused on interactive maps that visualize terrain challenges like mud or obstructions. These systems address the material dimension of mobility by enabling confident planning and movement while empowering users to engage fully in the social environment of public events.

Physical settings, material spaces, and design innovations were explored through modular and adaptable systems that address mobility challenges. Some student projects presented modular seating solutions that can be reconfigured to accommodate varying user needs, transforming static spaces into dynamic, user-centered environments. Another group of projects explored mobility pathways ramps to address accessibility challenges on uneven or obstructed

Figure 2 VR Simulations for Universal Design. Top: A mobile VR wheelchair simulator. Bottom left: A design student simulating an emergency in the wheelchair simulator to assess whether the alarm string can be reached after falling on a restroom floor. Bottom right: A mobile accessible toilet manufacturer testing the accessibility of their product at the Roskilde Festival.

Figure 3 Top: Design student Morten Deurell leading a co-creation workshop with wheelchair users at Roskilde Festival's "Handicamp." Bottom left: Final design proposal featuring a foldable ramp with railings and improved handles, offering remote control via an RFID keychain. Bottom right: Detail of lamps with enhanced visibility, ensuring they can be seen both from inside and outside.

surfaces. These innovations facilitate smoother, less physically taxing navigation for wheelchair users and others with walking impairments. Several design concepts tackled tactile navigation systems, such as braille maps or tactile indicators, supporting visually impaired users who rely on sensory feedback to navigate public environments independently. Some student designs also addressed inclusive queuing systems, integrating features like large buttons, audio feedback, and braille displays.

Case study: VR-support for Design

Research highlights the effectiveness of VR in accessibility testing, with studies such as those by Palmon et al. (2005) and Götzelmann and Kreimeier (2020) demonstrating how VR environments enable detailed evaluations of wheelchair access in both urban spaces and building interiors. Perez et al. (2022) further illustrated how user-driven VR environments can assist in the iterative design of accessible spaces by systematically collecting feedback on usability constraints.

Access to appropriately designed toilet facilities is essential for ensuring independence, dignity, and inclusion for users with disabilities. Poorly designed mobile toilets at festivals often create significant *material and embodied barriers*, such as insufficient maneuvering space, steep ramps, or poorly placed fixtures, which restrict bodily autonomy and limit users' ability to participate fully in the social environment. The integration of virtual reality (VR) and wheelchair simulators offers a groundbreaking approach to assessing the accessibility of mobile toilets. These technologies allow designers and stakeholders to experience and evaluate spatial configurations and usability constraints from the perspective of wheelchair users.

DTU students and researchers (Hansen et al. 2019) developed a low-cost wheelchair simulator to support manual and electric wheelchairs, providing flexibility and portability for diverse applications. → Figure 3 This technology was showcased at the 2023 World Congress of Architects, presenting a VR game integrated with their wheelchair simulator. This system tracked user interactions in virtual cityscapes and apartments, automatically logging collision data and identifying areas of restricted mobility. Evaluations confirmed

the simulator's capacity to replicate embodied experiences of wheelchair navigation, eliciting comments such as "it felt very realistic" and "I gained a deeper understanding of the challenges faced by wheelchair users."

The use of VR in assessing mobile toilets can similarly identify material challenges like collision points and spatial constraints, ensuring that fixture placement and spatial dimensions align with users' mobility needs. By integrating VR wheelchair simulators into the design process, students, researchers, and manufacturers were able to simulate material constraints and embodied experiences before real-world implementation. The simulator provided actionable insights for improving layouts, fixture placements, and spatial dimensions, ensuring that mobile, accessible toilets met diverse user needs.

Case study: Co-creation design workshops to improve mobile, accessible toilets at Roskilde Festival

A student project (Deurell 2024) emphasised user-centred design processes to co-create toilet facilities that support bodily autonomy while improving usability for diverse needs. Stakeholder engagement revealed critical issues such as poorly designed access systems, including heavy doors, difficult locks, and steep ramps. These challenges impact the *material dimension* of accessibility, where the physical design of ramps and entrances directly affects users' ability to navigate independently. To address this, Deurell proposed lightweight, automated door systems combined with modular ramps. The interior layout of accessible toilets was another focus area, addressing the *embodied performances* of users as they move and interact with assistive devices within confined spaces. Solutions included foldable grab bars, adjustable fixtures, and increased interior space, which improved functionality and comfort. For users with limited hand strength or dexterity, intuitive lock mechanisms were developed, reflecting the *minimal physical effort* principle of universal design. Feedback from visually impaired users underscored the importance of visual, tactile, and auditory cues for navigation. In response, Deurell enhanced the signage to improve the visibility of the toilet and clearly indicate its occupied or available status from a distance. → Figure 3

Discussion

The integration of the Mobility Turn framework and Universal Design principles at the Roskilde Festival highlights the potential of temporary urban spaces as platforms for cultivating inclusive design practices. However, while festivals provide a unique "living laboratory" for experimentation, they also pose significant challenges that raise broader questions about the effectiveness and generalisability of this approach. In this section, we will discuss some of these using the theoretical framework.

Festivals are inherently temporary, which can limit the scope and durability of implemented solutions. While this temporality encourages rapid prototyping and adaptability, it also raises questions about the scalability and sustainability of design interventions. For instance, solutions tailored to the festival environment, such as modular ramps or accessible seating, may not seamlessly translate to permanent urban infrastructures where longer-term use, weather conditions, and broader regulatory requirements must be considered. This raises the issue of whether festival-driven designs risk being overly situational, focusing on immediate usability rather than long-term applicability. Furthermore, the regulatory frameworks that make up the technical and legal context in 'real life' are absent from Roskilde Festival. Roskilde Festival is a 'simulation' with constraints but also simplifications compared to the world outside.

The resource-intensive nature of co-creation processes, particularly when involving diverse stakeholders, can be challenging to scale. Festivals like Roskilde attract a quite a wide demographic, yet logistical constraints often limit participation to select groups, potentially excluding perspectives from underrepresented users. Additionally, the focus on user-centered design can inadvertently prioritise the needs of more vocal or accessible stakeholders, marginalising those who are less able to engage in co-creation workshops. This raises questions about how truly inclusive these processes are and whether they risk reinforcing, rather than mitigating, systemic inequities.

The MT framework emphasizes the interconnectedness of physical, social, and cultural dimensions of mobility, highlighting how barriers are often systemic rather than

isolated. However, festivals typically operate within controlled environments, which may not fully replicate the complexities of mobility justice in broader urban settings. For instance, while addressing physical barriers like steep ramps or narrow doorways is relatively straightforward, tackling invisible barriers, such as stigma or unconscious biases against people with disabilities, requires deeper cultural shifts that extend beyond the festival context. This raises a critical question: to what extent can festivals serve as proxies for real-world mobility challenges? On the other hand, we may also find in the festival's temporary and complexity-reduction an inspirational model for 'urban experimentation' that city governments might find inspiration in.

Festivals have tight schedules, budget constraints, and competing priorities. Balancing inclusivity with cost-effectiveness can lead to compromises in design quality or implementation. For example, while modular solutions and low-cost materials may be practical for festival use, they might not meet the durability or aesthetic standards required in other settings. Additionally, operational pressures, such as managing large crowds or ensuring quick installation of facilities, may deprioritize the thorough testing of inclusive designs. Hence, the collaboration between festival organisers and research environments may guarantee the needed systematic and rigorous data- and evidence collection.

Using festivals as test beds for design experimentation raises ethical concerns about the balance between innovation and user well-being. While participants may consent to engaging with experimental prototypes, there is a risk that untested solutions could inadvertently inconvenience or harm users. For instance, poorly executed locking mechanisms or navigation aids could exacerbate frustration for people with disabilities, undermining the intended benefits of the designs. Ensuring that experimental interventions adhere to rigorous ethical standards is crucial to avoid unintended consequences. Here we might envision a stronger involvement of e.g. disability NGOs or municipal 'accessibility councils' when setting up the design experiments.

From an educational perspective, festivals provide an invaluable opportunity for students to apply theoretical principles in dynamic, real-world contexts. However, this focus on student learning can sometimes overshadow the primary goal of addressing accessibility challenges. Design solutions may be constrained by students' limited experience or resources, potentially resulting in projects that prioritize creativity over practicality. This raises the question of how to strike a balance between fostering an inclusive mindset among students and delivering meaningful, impactful solutions for festival attendees. To ensure the latter the involved educational institution must take on the responsibility for preparing, monitoring, and debriefing the students involved.

Roskilde Festival has successfully integrated inclusive design practices, but their influence on broader social change remains uncertain. Temporary design interventions may inspire awareness but lack the systemic reach needed to drive lasting societal shifts. Addressing deeper issues of mobility justice and universal access requires sustained advocacy, policy changes, and widespread cultural transformation – goals that cannot be fully achieved within the confines of a festival setting. To move towards such goals requires recurrent and systematic data collection and research evaluation with the aim of generalizing principles for inclusive social transformation, and re-circulating these into wider societal contexts.

While VR provided an immersive tool for understanding accessibility challenges, it also presented practical and conceptual limitations. A key issue was the lack of tactile feedback, reducing realism in interactions like gripping door handles or navigating uneven terrain. This gap between virtual simulations and real-world experiences is crucial in the MT framework, which emphasizes both visual and physical engagement. VR-induced discomfort, such as cybersickness, posed barriers, especially for users with sensory sensitivities. These limitations highlight the need for complementary methods like physical mock-ups or mixed reality (XR) to enhance immersion while mitigating challenges. Logistical hurdles, including equipment costs, technical expertise, and iterative design time, also impact VR's scalability, particularly in resource-limited settings like temporary festival environments. Despite these challenges,

VR proved valuable for design and empathy-building when integrated with the MT framework. For instance, simulating wheelchair users struggling in festival toilets helped identify subtle but impactful barriers, such as unreachable alarm strings.

Integrating VR with co-creation methodologies offers another promising direction. Engaging stakeholders in participatory VR environments enables richer feedback and collaborative problem-solving, such as visually impaired users refining virtual tactile navigation aids before real-world prototyping. Additionally, translating VR insights from festival settings to urban environments could help simulate complex mobility interactions, including traffic systems and pedestrian movement.

Future VR/XR applications should enhance embodied realism through haptic feedback or multisensory environments. For example, force-feedback devices could simulate the effort required to operate locks or maneuver wheelchairs, improving real-world accuracy. Beyond design validation, VR/XR could support mobility justice by visualizing hidden accessibility barriers, such as the effects of crowd dynamics or wayfinding challenges. Finally, ensuring broad access to VR/XR tools is essential for maintaining inclusivity in mobility design. Making these technologies affordable and accessible will help uphold the universal design principles central to mobility justice.

Final Reflections on Universal Design and Mobility Justice

The Roskilde Festival initiative demonstrates the transformative potential of combining the Mobility Turn framework with Universal Design in design education. By addressing the material, social, and embodied dimensions of mobility, students developed solutions that prioritised inclusivity and empowerment. The festival served as a "living laboratory", where students engaged with real-world challenges and tested their designs in dynamic, high-pressure environments.

Combining the MT and UD perspectives suggest that the fundamental human practice of moving (aided or not) within a built environment could be foregrounded when making

design experiments at Roskilde Festival. Taking point of departure in the understanding that one's body's movement within the set-up and staged experimental settings expose both practical and enabling dimensions of design solutions, but also where design becomes excluding, where bodies feel friction. The merit of taking this relatively mundane perspective of movement and accessibility into a wider mobility understanding points towards understanding the effects of mobility and immobility that touches on issues of justice, inclusion, and emotional responses to exclusion. The didactic point about foregrounding such a mundane practice as moving in the built environment is for the students to understand that 'functional' problems of access and inaccess reaches deeper into the social realm. And here the UD perspective suggests that by lowering the threshold for access and use (one of the key pointers of UD) we are not just enabling movement but also social justice and human flourishing.

In using experiments at the Roskilde Festival we are engaging a field of 'temporary urbanism' (Hayden & Temel 2006), 'catalyst architecture' (Kiib & Marling 2015), and 'performative urban design' (Kiib 2010), 'participatory actions in public' (Guerra & Ottolini 2019) exploring 'arsenals of exclusion and inclusion' (Armborst 2017). This is a tradition of critically challenging an abstract and detached modernist top-down planning and instead engaging with grassroots, bottom-up, civil society actors. The temporary nature of such operations are often strategically key when operating 'outside' a confined space as a festival for the political system to accept experimentation (assuming that no damage is done if one quickly can go back to normal). This is both a blessing and a burden. The temporary intervention allows for flexibility but at the same time any fruitful insights might fall on infertile grounds and be quickly forgotten. In our case here the focus is not big societal transformation, but rather didactic explorations and stimulating learning environments. However, there is merit in exploring the experimental model and collaborating with an organisation like Roskilde Festival might hold the potential for taking the results and findings from learning experiments towards a wider societal agenda.

Festivals are in a sense 'simulations' of cities (at least when they reach a size and magnitude of Roskilde Festival which is

at the size of a large Danish city). They hold urban properties such as streets, quarters, service- and welfare functions. Needless to say, they are not real cities. Rather, as simulations they are liminal spaces where aesthetic and cultural explorations (and consumption) might be enjoyed. However, seen from the point of scientific thinking, simulations hold the general property of a model. Models are like maps – they are not the world! They are extractions or simplifications of the world. Hence in that respect, 'thinking with Roskilde Festival' as we have done here is akin to a fundamental scientific modality: explore smaller parts of the world to understand the larger relationships.

In this account we have also touched on another dimension of 'simulation' namely the one we engage when using VR. As a matter of fact, the mock-up and building of physical interventions in this 'laboratory space' might also be understood as a simulation. But for the VR application the simulation dimension stands very strong in the foreground. In order to build good and persuasive simulations one must be well prepared and exercise the design imaginary before the event. Building up the artificial and simulated environment requires many skills and meticulous attention. The craftsmanship of building VR simulations is not our key concern here. However, we want to end on this note that with the exploration of universal design at Roskilde Festival we have engaged in a double – or perhaps even triple – simulation. There are strong didactic lessons to harvest from this work and we have pointed at some – as well as some of the limitations of course. But there is perhaps also a wider agenda for applying simulations and experimentations. Broadening out beyond the festival fence we see these simulations as strong inputs to wider policy and planning discussions relating to mobility justice and thus Sheller's key concern about 'who counts as a person?' but also to the pertinent and crucial question raised by critical disability scholar Sara Hendren when she asks 'who is the world built for?' (Hendren 2020, p. 17). To answer these two questions we find that combining the MT and UD perspective within an experimental and simulated setting as Roskilde Festival makes a productive and promising outset.

Section 4 Future Perspectives

Building on the previous sections, we challenge conventional understandings of universal design and centre the creative agency and work of disabled researchers, designers and activists.

Chapter 8 builds on disability justice and acknowledges disability as a generative force for innovation and for disrupting conventional design norms. These approaches advocate for the active participation of disabled experts, valuing their knowledge and lived experiences as essential contributions to design and scholarship. Bridging critical disability studies with architectural and digital design, this chapter argues for disability-led approaches to be a central transformative force in future UD projects.

Chapter 9 is framed around a conversation with the Danish disability visibility activist Cath Borch Jensen, who, through a combination of integrated dance and digital activism, challenges stigma and fosters dialogue on taboos related to disability. It presents how disability activism can offer new ways to approach UD as a tool for change and ends with a set of recommendations.

Chapter 8

Reframing Disability in Universal Design: Critical and Creative Practices Beyond Traditional Approaches

Roberta Cassi, Barbara N. Carreras, Valeria Borsotti, Masashi Kajita

Limits of conventional approaches

Universal Design (UD) aims to create environments accessible to the widest possible range of users, based on the belief that inclusive design benefits not only disabled individuals but society as a whole (Imrie & Hall 2003). UD emphasises inclusivity and functionality for all, accommodating various needs. Central to UD are principles such as equitable use, flexibility, simple and intuitive design, and perceptible information. These elements provide a foundation for the accessibility and usability of spaces and products, yet they have often been critiqued for their limited perspective on human diversity and the intersecting experiences of the surrounding world.

While UD undoubtedly offers practical benefits, it often obscures disability itself, along with the diversity of disability experiences that exist (Hamraie & Fritsch 2019). Moreover, accessibility, usability, and inclusion are often defined and implemented by non-disabled designers and professionals who, despite efforts to understand disabled experiences, lack the lived experience and knowledge of disability culture and community necessary to grasp the full complexity of disability (Boys 2018). Differently, scholars in critical disability studies and architecture Aimi Hamraie and Jos Boys advocate for approaches that integrate disability as an active, creative, and critical element in design.

Hamraie's critique of traditional approaches stems from the notion of "access" not as an automatic or unquestioned good but as a concept requiring collective discussions on experiences of inclusion and exclusion (Hamraie 2017). In *Building Access*, Hamraie revisits key historical moments in the evolution of UD as a design movement to illustrate how, despite rights-based approaches to accessibility, such as the Americans with Disabilities Act (ADA), systemic inequalities persist as compliance frameworks are insufficient to encompass the diverse access needs of the population.

These inequalities are often reinforced through architectural, economic, and political structures that continue to marginalise disabled individuals of different backgrounds at the intersections of race, class, gender, or other markers of oppression (Hamraie 2017). As a response, Hamraie examines how design choices and societal norms influence how questions of access and UD are framed. Hamraie foregrounds the need to re-examine the assumptions embedded in so-called "universal" solutions that promise to include all, while contributing to different forms of exclusion that span not only disability, but also race, gender, class, sexuality or religion. Within this perspective, rather than viewing access as a matter of compliance or smooth integration, Hamraie and co-author Kelly Fritsch frame access as a frictional and ongoing negotiation that necessitates constant re-evaluation, adaptation, and critique (Hamraie & Fritsch 2019).

Similarly, Jos Boys proposes a radical shift in how we conceptualize disability in architecture, advocating for disability to be seen not as a marginal concern but as a central, generative force in creative design (Boys 2014). Boys argues that the traditional view of disabled people as passive recipients fails to acknowledge the unique insights and agency that disabled people bring to architectural discourse. This limits the potential of architecture to challenge assumptions about ability and disability and to explore how designed spaces might accommodate a broader spectrum of human experiences (Boys 2018). Instead, starting from disability – viewing it as an integral part of the design process rather than as an afterthought – opens up architecture to the possibility of new forms of creativity and design sensibility that move beyond compliance-oriented solutions.

Through this chapter, we aim to explore how Hamraie and Boys' theories, at the intersection of architecture and Science and Technology Studies (STS), challenge traditional frameworks. Drawing on these perspectives, we show examples of how alternative approaches that centre disability as an informative and creative source have been put into practice and applied in real-world contexts. Following the examples, the chapter concludes with a discussion on the implications for UD, analyzing how these practices both extend and critique traditional UD, advocating for more

collaborative and participatory approaches that actively involve disabled people as experts.

Frameworks for critical and collective accessibility

Participatory design and UD practices have often been critiqued for their reliance on non-disabled experts designing solutions *for* disabled individuals, rather than engaging them as active collaborators or leaders in the design process (Hamraie 2017; Bennett & Rosner 2019). In response, Hamraie introduces the concept of crip technoscience, a transformative and disruptive praxis (Goodley 2018) building on crip theory and feminist scholarship that re-centers the leadership and expertise of marginalized people, including disabled people. Drawing from critical disability studies bridging intersectional research and STS, this framework emphasizes *knowledge-making* – the dynamic interplay between knowledge creation and material production – which is profoundly enriched when disabled people and other marginalised communities are at the forefront of design initiatives (Hamraie & Fritsch 2019).

By emphasizing the expertise of disabled individuals, crip technoscience redefines accessibility as a relational, frictional, and collaborative practice and experience (Hamraie 2017) (Hamraie & Fritsch 2019). In crip technoscience, accessibility requires pushing against dominant norms and practices in society that privilege whiteness, heteronormativity, able-bodiedness, self-reliance, and productivity, or other forms of marginalisation, often revealing the complex barriers within supposedly accessible environments (Hamraie 2017). By framing access as an opportunity for resistance rather than assimilation, crip technoscience emphasises that accessibility arises from shared cultural practices and relationships of solidarity.

Projects carried out within the *Critical Design Lab (https://www.criticaldesignlab.com/)* exemplify this approach. The *Critical Design Lab* is a multidisciplinary collaborative project of disabled artists, researchers, technologists, and designers and the name makes it clear that the design work they do is meant to challenge assumptions about design. This multidisciplinary collaborative project focuses on creating design protocols informed by disability culture rather than adhering to prescriptive design standards. The protocols developed,

which are open-source and adaptable, serve as an alternative to the normative approaches to design made by non-disabled researchers. Also, these protocols, unlike standards, are meant to evolve based on context, community, and cultural significance, reframing access as a collaborative, relational, culturally embedded and continuous practice that extends beyond compliance with disability laws and rights-based models of access (Hamraie 2017).

By centralising disability as an asset for design, designers can become more sensitive to the many social and cultural dependencies that are part of the everyday experiences of people with disabilities (Merit et al. 2024). Boys emphasises the importance of valuing diverse embodiments and ways of interacting with space, arguing that such diversity enriches rather than detracts from design practices (Boys 2014) (Boys & Kajita 2023). On the same line of Hamraie's work, through a critical exploration of "not ordinary" practices, Boys seeks to promote an architectural shift, envisioning a built environment that does not simply accommodate disability as an exception but that encompasses a fuller range of human experiences and capabilities (Boys 2014). By foregrounding diverse experiences, this approach underscores diversity as a "creative generator for design" (Boys 2020) (Roberts & Boys 2020), highlighting the potential for more innovative solutions that embrace and prioritise varied human experiences.

Building on these transformative perspectives, it is essential to integrate participatory approaches that actively involve individuals with disabilities in the design and planning processes. These collaborative methodologies not only foster a sense of ownership and empowerment among people with disabilities but also uncover innovative solutions that might otherwise be overlooked (Boys 2014). Additionally, these approaches can further dissolve assumptions and norms, encouraging a shift from viewing disability as an exception to recognising it as a natural aspect of human diversity, therefore transforming how disability is both perceived and addressed.

Examples of alternative practices:

The following section presents a range of practices that go beyond traditional approaches to accessibility and

inclusion, centering the lived experiences and expertise of disabled individuals. These examples include 1) participatory accessibility mapping projects, 2) disabled-led artistic initiatives, and 3) collaborative digital design projects that illustrate the transformative potential of disability as a generative force. By showcasing these alternative models, we highlight how shifting from compliance-based frameworks to participatory and justice-oriented approaches can reshape both physical and digital environments. While the examples we analyse are situated in the Global North, it is crucial to consider how differing geopolitical contexts and factors – such as economic resources, policy frameworks, and cultural perceptions of disability – differently influence the implementation of inclusive design practices. Furthermore, these are just a few examples of practices that the authors have encountered through their research and professional engagement, but they represent only a fraction of the diverse and evolving landscape of alternative accessibility and inclusion initiatives and projects that may be blooming around the globe.

1) Participatory accessibility mapping projects

The built environment often fails to meet diverse access needs and accessibility standards, presenting barriers such as visually dominant wayfinding, poor lighting, perfumed areas, non-existent ramps, narrow doorways, inaccessible toilets, or poorly maintained elevators, etc. Even refurbished or new buildings, while compliant with regulations, often do not consider the complex experiential aspects of accessibility, rendering them inaccessible or uncomfortable to many individuals. In response, disabled activists have been instrumental in challenging systemic forms of neglect, amplifying the lived experiences and access needs of disabled people and other marginalised communities who may not identify as disabled such as immunocompromised people, and advocating for equitable access across all areas of public life. A critical tool for addressing these inequities is accessibility mapping, which highlights gaps in the built environment that hinder mobility and inclusion. Below, we highlight a few examples of mapping practices that emphasise participatory methods and center the voices and experiences of disabled individuals, moving beyond regulatory compliance toward justice-oriented and solidarity-oriented design strategies.

Mapping Access, by Critical Design Lab

The *Mapping Access* project, led by Aimi Hamraie and the *Critical Design Lab*, is an interdisciplinary initiative focused on rethinking accessibility through alternative mapping methodologies. Based at Vanderbilt University, in Nashville, and rooted in principles of Disability Justice, the project applies the protocol developed within *Critical Design Lab* by engaging diverse communities, particularly disabled individuals and other marginalised communities in participatory activities to assess and visualize the accessibility of built environments (Figure 1). Through tools such as community conversations, user-generated surveys, and Map-a-thon events, the project invites participants to critique traditional compliance-based standards and develop alternative analyses of built environments that show how different forms of marginalisation across race, gender, class, and disability intersect with spatial inequities. The aim is not only to collect data but also to transform accessibility into an ongoing understanding and commitment.

The Urban Belonging

In Denmark, researchers from the Techno Anthropology Lab (TANT Lab), Gehl Architects, colleagues at Aalborg University, the Visual Methodologies Collective, and the Public Data Lab created a digital app to enable local communities to generate data about their attachments to urban spaces in Copenhagen. → Figure 2 The project involved local community members representing Deaf, unhoused, and disability rights advocates, as well as racialized communities and LGBTQ+ representatives. Researchers developed a mobile app which participants could use to take photo routes and share annotations using geolocation data. Single photos are geo-stamped while photo routes are geo-traced for a limited amount of time. The data collected was later analysed by researchers and participants through a series of workshops where both qualitative and quantitative data were discussed. The app has later been used in other projects where geolocation data, photos and annotations are useful to spark conversations about belonging and access in public spaces. The app is currently under development to comply with web accessibility standards and be usable by blind persons and people who benefit from digital accessibility. The development is driven by the ECHO Lab at the Technical University of Denmark and the TANT Lab.

Figure 1 A map showing an aerial view of Vanderbilt University's Campus with different pointers of different colours and symbols like a drop of water, a chemical bottle, a circle, a house, a gender binary sign, a wheelchair user symbol, among other symbols. The map is shown on a website titled VU Mapping Access. A menu displays three web pages: 1) About, 2) Vanderbilt Library, 3) Mapping Access Facebook. In the top right corner, there is a search function on the menu and a button inviting users to submit data points to the map. All points are selected. One of the pointers displays a pop-up window showing a photograph of an entrance to a building that seems accessible to wheelchair users. The pointer also displays a wheelchair user symbol. The title of the photo is Curb Center Building. The user has left an annotation: "There are three barrier-free entrances." A previous and next links on the image may allow users to see other photos pinned on the map.
© Critical Design Lab
(https://www.criticaldesignlab.com/project/mapping-access)

Figure 2 A screenshot from the Urban Belonging Project shows a map of Copenhagen with geodata pointers in different colours. At the top, the logos for Urban Belonging app, TANT Lab, Masshine, and the ECHO Lab. A text below the menu explains that the map shows 981 photos and 127 walks created by mobile users. On the left side of the map, users of the website can select between different user segments through different filters: internationals, Deaf people, physically disabled, mentally vulnerable, LGBTQ+, ethnic minorities, houseless, researcher, and SUMO. The map also enables users to organize information according to how users agree to the question: "Do you feel this is for you?" Categories made by users are displayed as tags answering the question: "What do you notice in the picture?" The tags are architecture, urban environment, objects, signs and symbols, urban nature, wind and weather, culture, consumption, people/community, infrastructure, memories and associations, atmosphere, don't know. On the right side a photograph by one user corresponding to a point on the map displays a forest path. The annotation responds to the question: is this for you? Through a slider "for me". There are 5 reactions to the photograph, but these are not displayed or within the screenshot composition.
© The Urban Belonging Project (https://urbanbelonging.com/)

Mapping Disability, access to Danish art spaces

The project *Mapping Disability* is an artistic initiative that aims to generate dialogue about the persistent inaccessibility of many art spaces in Denmark, both privately and publicly funded. While these spaces are intended to serve all members of society, they often remain inaccessible to disabled individuals. Using the app developed by Urban Belonging, artists Anthony Dexter Giannelli, Cath Borch Jensen, and Anna Walther have documented their personal encounters with inaccessibility, creating maps that visually represent these challenges and that show the complexities of navigating the art field while living with a disability. This mapping process is not meant to offer solutions or a definitive account of the broader systemic issues; instead, it seeks to highlight individual perspectives, fostering awareness and critical reflection within the cultural sector. Through ongoing documentation and future collaborations with other artists and curators, *Mapping Disability* aims to challenge the barriers that prevent disabled individuals from fully participating in art and cultural spaces and events. The goal is to demonstrate the impact of these obstacles, to encourage institutions to engage with new conversations, and contribute to a framework that advocates for change in Danish art spaces.

2) Disabled-led artistic initiatives

Art and design have long been powerful mediums for challenging societal norms and amplifying marginalised experiences and knowledge. In recent years, disabled artists and collectives have used various platforms to express their unique creativity while championing greater accessibility, and representation in cultural and social spaces. Through mediums such as painting, sculpture, digital media, and performance, disabled artists explore themes of identity, embodiment, agency, and social justice. Also, collaborative initiatives, such as participatory workshops and co-design projects, further amplify these efforts by fostering dialogues between disabled and non-disabled participants, reshaping the cultural and physical landscapes of art and design. As the cases presented below illustrate, these initiatives aim to address the inaccessibility of many art spaces and highlight the value disabled artists can bring to contemporary art practices.

DisOrdinary Architecture Project

The *DisOrdinary Architecture Project* is a UK-based not-for-profit organisation platforming disabled, neurodiverse artists and architects to challenge norms around disability, art, design and inclusion in the built environment and cultural sectors. Founded in 2007 by Zoe Partington and Jos Boys, the project views disability as a creative generator for design, advocating for socially just and inclusive spaces through participatory workshops, co-designed interventions, and collaborative research. With a living archive of resources and projects, *DisOrdinary Architecture* reframes access and inclusion as dynamic processes rooted in disability justice, aiming to inspire cultural and architectural practices to embrace and celebrate diversity. Among the resources developed within this project, "Many More Parts than M!: Reimagining Disability, Access and Inclusion beyond Compliance" is a prototype compendium that brings together a wide range of concepts, narratives, artistic works, and architectural details. Organized around an alphabet of key terms, it introduces ideas that challenge the British regulation on buildings' accessibility and use by encouraging a broader and more imaginative discourse on accessibility.

Project Art Works

Project Art Works (https://projectartworks.org/the-organisation/) is a collective of neurodivergent artists that has been active for 25 years. Based in Hastings, England, the collective has built an archive of over 6,000 artworks, ranging from figurative to abstract styles. The collective's exhibition, Residential, reflects *Project Art Works'* approach by offering open art-making spaces where individuals of all abilities can explore materials, connect, and co-create, thereby positioning artistic practice as a fundamental human right. The collective space, temporarily established at Copenhagen Contemporary (CC), → Figure 3 not only facilitates inclusive participation in the art experience but also provides CC with a model for developing similar initiatives that invite neurodivergent groups to engage with art.

DISrupt

DISrupt (https://disruptartsleeds.co.uk/) is a collective of disabled artists in Leeds committed to dismantling barriers that exclude disabled artists from full participation and recognition in the art world. The *DISrupt* project works to

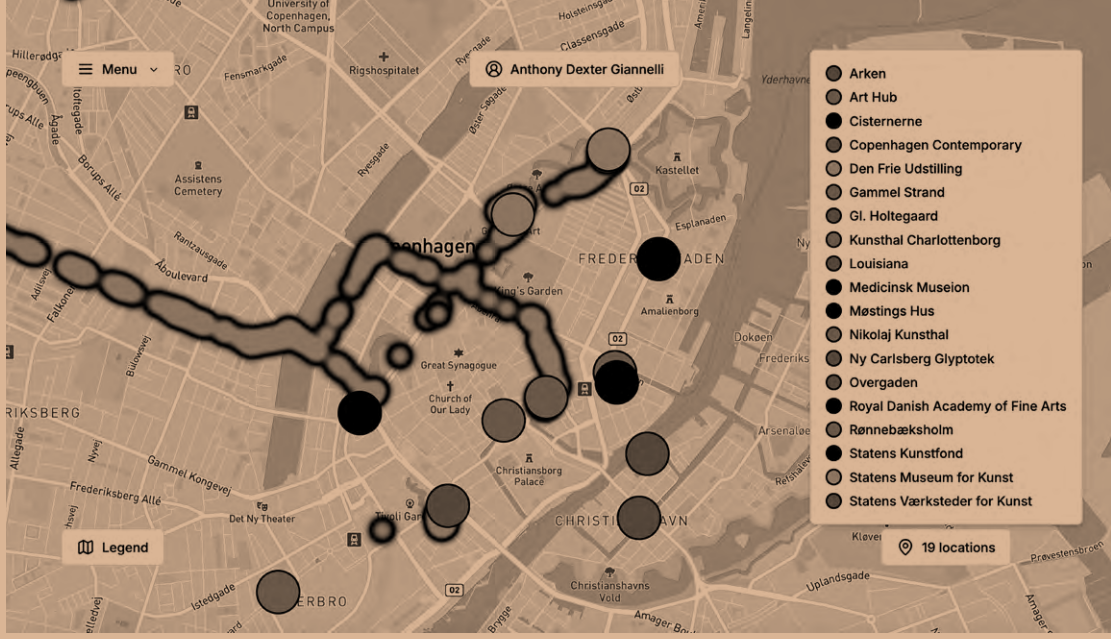


Figure 3 A digital map of Copenhagen with art-related institutions indicated through colored circles according to their accessibility. The map interface includes two main buttons: a "Menu" button in the upper-left corner and a "Legend" button in the lower-left corner. On the right, there is a list of 19 specific art-related locations. Locations include museums and galleries categorized by colour in terms of how accessible they are. Within this list, the Medical Museum, Møsting Hus, Cisternerne and Statens Kunstfond are marked in black as inaccessible. Overgaden, Louisiana, GL. Holtegaard, Copenhagen Contemporary, Arken and Statens Værksteder for Kunst are categorized under low accessibility Nikolaj Kunsthal, Kunsthal Charlottenborg and Rønnebæksholm are grouped under medium accessibility. Den Frie Udstilling and Statens Museum for Kunst are colour coded as highly accessible. None of the galleries outlined is fully accessible.
Some of the circles are interconnected by heatmap-like trails of red, orange, and yellow colours, indicating the level of mobility along the route.
© *Mapping Disability (https://mappingdisability.com/)*

Figure 4 This image shows a brightly lit art gallery space with a high, arched wooden ceiling and large skylights that allow natural light to pour in. The focal point is a large gray wall filled with colourful paintings of various sizes and styles. The artworks predominantly feature abstract imagery, with bold brushstrokes, vivid colours, and playful forms. Some paintings depict flowers, scribbles, faces, and layered text. The overall atmosphere is cheerful and creative.
© Residential, Project Art Works, Photography by David Stjernholm, 2024 Denmark

challenge ableist stereotypes, amplify disabled voices, and promote the professional development of disabled artists. The collective's mission extends beyond artistic practice by advocating for structural change in the cultural sector to create inclusive and accessible opportunities. By fostering peer support, providing safe spaces for dialogue, and promoting diverse artistic expressions, *DISrupt* empowers disabled artists to claim their rightful place within the arts. With an ambitious and original approach, the collective strives to reframe perceptions of disability in art, celebrating its contributions to cultural richness.

Sins Invalid

The project *Sins Invalid* (10 Principles of Disability Justice | Sins Invalid) originated in the United States and is driven by queer Indigenous, Black and Brown disabled artists. Using performance art, the project amplifies disability justice frameworks of access in which intersectionality and the leadership of those most impacted by injustice, and inequality is amplified. The intersectional approach to access of the performance group is tangible in how the artists use non-binary language and accessible forms of communication including sign language, image description, plain language and visual information in English and Spanish. The performance group also provides recommendations on how to create accessible events, considering physical access, allergies, remote access, language accessibility, interpretation and live captions, masking as well as suggestions for receiving feedback (Access Suggestions for Public Events | Sins Invalid).

3) Collaborative digital design projects

Through disability rights activism, people with disabilities and their allies have for decades pushed for equal digital access – often by filing accessibility complaints and lawsuits in the context of an increasingly regulated digital landscape. The first standards regulating web accessibility were established in 1999, following The Americans with Disabilities Act (ADA), when the W3C (the World Wide Web Consortium) created the WCAG 1.0. Between then and now, new sets of standards and digital accessibility laws and regulations have been introduced worldwide, but digital accessibility is still an issue in the context of many services, products and systems. In this context, people with

disabilities are actively engaged in countless critical and collective approaches to the design, co-design and maintenance of digital products and systems, such as in the three examples listed below. Collaborative approaches to access are typically achieved through co-design and co-creation via creative partnerships, as illustrated in case 1; disability-led design, often paired with open-source software approaches, as in case 2, and disability-led feedback processes for the improvement and re-design of digital services, as in case 3.

The Inclusive Design Research Centre (IDRC) for digital inclusion

The IDRC, at Ontario College of Art & Design University in Canada, works iteratively with co-design and always centers disability in projects that proactively prevent barriers and promote inclusion in technical systems. The center was founded by Jutta Treviranus, and has helped, among many others, with the establishment of the historical Web Accessibility Initiative at the W3C, and a new framework for Accessible and Equitable Artificial Intelligence (AI) in Education. The center provides a variety of open-source toolkits such as the Community-led Co-design kit *(https://co-design.inclusivedesign.ca/)*, moving from "design for to design by" communities.

CodeTalk

Digital tools for software developers are typically created and tested by and with non-disabled persons. If sighted developers can glance through code quickly, the same visual information is not available to screen readers users. *CodeTalk* is a tool developed by Venkatesh Potluri, a computer scientist and Assistant Professor at the School of Information, University of Michigan who is visually impaired. He is dedicated to enhancing the programming experience of blind and visually impaired developers. The tool is open source and always welcomes contributions from the developer community. *(https://github.com/microsoft/codetalk)*

The Braille Monitor advocacy toolkits

The US National Federation of the Blind publishes a news magazine that features tools for self-advocacy by and for blind and visually impaired individuals. Some of these resources give hands-on instructions on how to provide feedback to organisations providing services or products

that are not accessible, in order to raise awareness of access barriers and ask for change. One of these is a toolkit on how to report digital accessibility issues effectively: reporting issues helps the software developers fix them, and educates them about the multilayered needs of blind and visually impaired users. *(https://nfb.org/sites/default/files/images/nfb/publications/bm/bm18/bm1810/bm181003.htm)*

The examples presented here illustrate how alternative practices in accessibility mapping, art & design, and digital systems converge to challenge and redefine traditional approaches to accessibility and inclusion. Collective spaces and initiatives emphasise participatory, disability-led, and justice-oriented methodologies that center the lived experiences of disabled individuals, by also highlighting the possible intersection of creativity and advocacy in reshaping environments and cultural norms. Likewise, examples in digital accessibility showcase the potential for collaborative, open-source solutions to address systemic barriers and co-produce knowledge with impacted communities.

Discussion: Implications for Universal Design as a tool for change

The cases and practices presented in this chapter reveal several key insights that highlight how UD can become a transformative driver for change:

→ Disability is a generative force for innovation that rethinks access and inclusion. The examples of disability-led initiatives demonstrate that when disabled individuals take the lead in design processes, new and creative solutions emerge, extending the understanding of accessibility. Rather than viewing disability as a limitation requiring accommodation, these approaches recognise the unique perspectives and problem-solving strategies of disabled practitioners as experts in accessibility. Projects such as *Mapping Access* and *The Urban Belonging Project* reveal that access is not merely about physical infrastructure, such as ramps or elevators, but also about sensory, cognitive, and social dimensions of inclusion. For example, Sins Invalid expands the definition of accessibility by incorporating sign language, plain language, and image descriptions, demonstrating that access must be broadly seen to

accommodate diverse needs. Similarly, digital accessibility initiatives like *CodeTalk* and the *Inclusive Design Research Centre* address barriers in software development, highlighting the importance of technological inclusion in an increasingly digital world.

→ Accessibility is an ongoing, context-specific, cross-solidarity and collaborative process. Rather than focusing solely on disability as a singular issue, these projects embrace continuous collaborative approaches that bring together diverse marginalised groups, reinforcing the interconnected nature of social justice struggles. The *Urban Belonging Project* exemplifies this by including unhoused, racialised, and LGBTQ+ communities in its participatory mapping process, demonstrating how dynamics of inclusion and exclusion in urban spaces are shaped by multiple intersecting identities. The concept of cross-solidarity also extends to digital accessibility, where open-source platforms like *CodeTalk* invite contributions from both disabled and non-disabled developers to collectively improve accessibility tools. These collaborations not only strengthen advocacy efforts but also create shared knowledge and foster mutual accountability among different communities.

→ Disability expertise results in transformative knowledge. The examined cases highlight that disability expertise is a vital form of knowledge that reshapes accessibility discourse and design practices. Rather than being passive subjects, disabled individuals actively contribute to knowledge production and design practice. Projects such as *Mapping Access*, *Mapping Disability,* and *Code Talk* position disabled people as experts in identifying spatial and digital barriers, demonstrating that their lived experiences provide insights that traditional design processes often overlook. Similarly, *Project Art Works* and *DISrupt* show how disabled artists generate new understandings of cultural participation by challenging ableist assumptions in the art world.

The critical perspectives represented by figures like Hamraie and Boys further underscore a crucial tension within UD as both a conservative and potentially activist discourse. While

UD can become an effective lever to make environments more accessible, its conventional frameworks often fall short of addressing the complexities of disabled individuals' lived experiences. As the presented practices and projects reveal:

→ UD can benefit from a broader approach, recognising that disability is not a singular experience but a plurality of multi-layered perspectives, needs, and values. By embracing this plurality, UD could evolve from a static, compliance-driven model into a dynamic, inclusive framework that fosters collaboration and respects diverse forms of access and inclusion.

→ These alternative practices emphasise that accessibility is not a finite goal but an ongoing project that requires active participation from those it seeks to serve. This brings up important issues of how to practically foster the involvement of people with disabilities, and their networks, in ways that are fair and not exploitative.

→ This also raises more political questions of how to structurally support the leadership of people with disabilities of different backgrounds in design, digital design and architecture, and how to better integrate intersectionality, accessibility, disability studies, critical design and UD in the curriculum in order to educate the next generation of designers and co-designers.

→ Finally, it is essential to encourage discussion on how interdisciplinary research can facilitate innovative ways of foregrounding disability expertise in knowledge production. Such research would actively engage in epistemic and ontological activism, transforming established ways of knowing and critically challenging underlying assumptions about the nature of objects, spaces, and social interactions.

Conclusion

UD, in its current state, risks reinforcing ableist assumptions if it remains rooted in a prescriptive, top-down approach. Scholars such as Aimi Hamraie and Jos Boys argue for a critical re-evaluation of UD, underscoring the potential for disabled individuals to reclaim design practices and reframe accessibility as an act of resistance and

empowerment. The emerging movements and alternative practices presented in this chapter illustrate a fundamental paradigm shift in the way disability can be approached within UD and beyond. Rather than viewing disability as a problem to be accommodated through standardised solutions, these perspectives reframe disability as a site of knowledge production, capable of transforming our understanding of and approach to accessibility. The discussion of alternative practices and emerging perspectives suggests that the future of UD lies in its ability to evolve into a more dynamic, interdisciplinary, and intersectional practice. Moving forward, critically engaging with disability, and more broadly with human diversity as a generative force, rather than a marginal concern, will be key to advancing accessibility and inclusion in meaningful ways.

Chapter 9

Body Activism, Disability Visibility and Universal Design: Reimagining New Approaches with Cath Borch Jensen

Valeria Borsotti, Cath Borch Jensen, Mia Høj Mathiasson

Introduction

This chapter is about change-making, and it discusses what Universal Design (UD) can learn from disability activism. Over the past decades, a growing community of disability activists in Denmark has been working to give non-conforming bodies greater visibility, facilitating open discussions and advocating for radical ways to tackle stigma, systemic barriers and negative attitudes around disability. The work of these activists often runs parallel to academic and practice-based UD projects. Still, recent initiatives in Denmark have sought to create bridges between the world of UD and disability activism, creating new encounters and opportunities for dialogue and exchange (Frandsen et al. 2023). This chapter is one such encounter. We reimagine new approaches to UD by centering the perspective and work of Cath Borch Jensen, an activist who lives with cerebral palsy (CP). Cath works, among other things, with integrated dance, a decades-old approach that expands the vocabulary of dance by centering the skills and movements of people with disabilities. While integrated dance has a long history in countries like the UK, it is still in its infancy in Denmark. Dance is a way for Cath to engage with body activism, which she defines as "the expressive and artistic use of my body to illustrate the challenges, structures, collective taboos and feelings around these structures, and the changes that are necessary for people with disabilities." Cath emphasizes the importance of using her body and voice to invite people into conversation, creating new spaces and opportunities for empathy and change.

Her activism also follows a digital path: under the hashtag #detviikketalerom (#whatwedonottalkabout), she breaks the silence around disability taboos and addresses the fear of making mistakes when asking about scary or uncomfortable things. Cath is active on several platforms, including LinkedIn and Facebook (*https://www.facebook.com/cathapuls*), which she uses for socializing, engaging in debates, and showcasing her many activities and affiliations as part of her

outgoing and inviting network-creation. Cath is also active on Instagram, where she shares images from her art practice and performances as part of her activism under the profile @cath_spastikermedstil, generously offering a glimpse into her everyday life with CP to break taboos through visibility and vulnerability.

In this essay, we explore key themes such as activism, accessibility, and giving visibility to disability, which are sometimes manifested bodily through dance and performance art, sometimes in conversations about difficult things, and sometimes just by being present and part of the conversation. Cath states: "I cannot say anything without it being about accessibility!" She invites us to consider body activism and disability visibility as necessary complements to Universal Design (UD).

When UD is well supported and integrated into government strategies and organizational practices, it creates spaces and products that are accessible to both disabled and non-disabled people. But, at the time of writing, the implementation of UD principles and practice in Denmark is still limited to a few exceptions, with the result that access barriers and disability-related stigma still abound. Body activism is, for Cath, a viable way to explore and engage with the inevitable frictions produced by lack of access and disability taboos as encountered in our cities, institutions, and relations.

In the dialogue below, Cath discusses these themes with the co-authors of this chapter, Valeria Borsotti and Mia Høj Mathiasson, two researchers working with inclusivity and accessibility in the cultural sector and active members of the Bevica Foundation Universal Design Research Network. Together, we conclude the essay with key takeaways and recommendations for how people working with UD could better emphasize disability visibility, sensory engagement, and ongoing, honest dialogue on the friction and barriers experienced by people with disabilities. As such, we advocate for new approaches to UD, which account for individual differences and frictions.

Valeria How would you introduce yourself?

Cath

I engage people with things we don't usually talk about, and I do that in different ways and with different modalities. I am a body activist, a dancer with years of self-taught and co-developed practice of integrated dancing, which here in Denmark is a very new field. I also work as an exhibition hostess at Copenhagen Contemporary Art Center.

Valeria How did your activist journey start?

Cath

My activist journey started when I came out of my mother's womb. I was born with cerebral palsy, and I am a wheelchair user. My mom was a punk, and I was a very wished-for and loved baby. I grew up in a non-accessible apartment located in a building from the late 1800s/early 1900s, where getting up in the morning was activism. Making myself lunch was activism in a kitchen that was not built for me.

My mom sent me to the Steiner School, where I had many emotionally clever teachers who saw me as a person. I also remember other kids bullying me, but our teachers always explained to them that it was not okay. At home, I grew up surrounded by love, creativity and a sporadically alcoholic mom. There was this attitude that the sky was the limit – that I could do anything I set my mind and heart on.

I spent a lot of time in hospitals as a kid because it was the 1980s, and doctors believed that you could fix kids with CP with surgeries while they were still growing. Many kids were hospitalised for this reason in the 1980s. So, I spent a lot of time away from school and away from home. From age two to fourteen, I was hospitalised and operated every second year. This, of course, affects your social skills with friends and other pupils. I loved school. I learned how to read and write before school started. But I discovered when I was very young that the world, the built environment, the educational system and the ways we talk to each other … all those different systems are not set up for people with non-conforming needs. And that covers a lot of people and a lot of needs! So, how do we talk about it?

When I was 10, I started contemplating how we could be better at discussing disability without being so afraid. It was a very sensory experience for me that people felt alienated when talking about differences. Not only when talking with me, but also in general.

Valeria

You once explained that your disability activism follows both a verbal and a non-verbal path with body activism. What's the difference?

Cath

Well, body activism can also be verbal, but the reason why I make a distinction between the two is that sometimes we need to explain, talk, and verbalise. Sometimes, we need to feel and have a somatic and emotional experience to find new words and new insights and to develop new ways of making a community of being together.

Valeria

Can you tell me about your digital activism with #detviikketalerom?

Cath

#detviikketalerom (#whatwedonottalkabout) is a hashtag I created and use across social media to highlight taboos and frictions, particularly around disability, in both institutional and relational spaces. There are many things we do not talk about, not only concerning disability but also grief, illnesses, and many other things we are ashamed of. Sometimes we are afraid of doing or saying something wrong, hurting others. Instead of asking, we just keep our mouths shut because a parent or a teacher once taught us that it is wrong to look or to ask.

If we don't talk about taboo topics, they get stuck in our bodies. In my practice as a body activist and dancer, I explore this connection between our minds, bodies and emotions. Our nervous systems and bodily emotions are very closely connected to what we verbalize or do not verbalize. I want to be able to expand my sensory experience and my life experience as far as possible. We can't do that if we're afraid.

Figure 1 Cath performing her dance solo Moder Træ in 2022. The show was choreographed and danced by Cath and produced by AniMaNi Teater, with music by Annemette Pødenphandt. Photography: Alex Mørch.

Figure 2 A screenshot from a video campaign by the Danish Disability Association (2024), in which Cath advocates for better labour conditions for people with disabilities in Denmark.

Mia

At a recent presentation, you mentioned friction as a keyword in your practice. You talked about experiencing friction both from the inside and the outside. Would you elaborate on what you mean by 'friction' and what this concept can potentially help us see or feel?

Cath

Being born with cerebral palsy is a state of tension. In my case, it is an overfiring of nerve signals to the muscles, which results in constant tension. So, every day, and also when I speak to you right now, my feet are tensing. This is why I wear a strap around them to keep them in place, so I have a balance point that can help me sit up straight. At the same time, that strap creates friction inside my legs. I accept that this friction is necessary for me to sit here, but friction is still there. Instead of stretching out, all the muscles in my body want to contract. And if you add cobblestones to that, it is from the outside and the inside. So, adding my inner contraction to the friction of my feet when talking and then the cobblestones, we have a lot of different layers (of friction), and somehow, I have come to terms with the fact that if I want to be outside and if I want to interact, that is a premise of being. I am tense, and it is invisible. I mean, if I showed you my legs, of course, you would see it, and that is part of why I think body activism is so important. It's also a visualization of what is really going on. But a lot of it is invisible.

This is my personal friction. And then, when you add the friction of people not being willing to accommodate an old building or accommodate an educational structure, or friction between myself and a personal assistant (PA) because they had a bad night's sleep, and we need to figure out how to make my everyday life work. I am really grateful that I have four PAs, but it is four different people in my life. We have systems. We know exactly how to do these things, but they do things differently, which is fine, but I'm still accommodating to that.

So, I have my own friction. We have our interpersonal friction. We have structural friction. When I start talking

about it to try to contribute to the healing, it can create more friction, so it is all over.

How do I go about that? It's a conundrum to me! That's also why it is so interesting to implement it in artistic practices: because then it hits us, and it hits me on different levels, in different conversational and non-verbal spaces. It's a feeling that tires me out. It is so innate to me that I am not conscious of it. Somehow, you just need to dance with that. And that's also why I am so fascinated with dancing.

I am always dancing with my friction. There's something moving through me that I then present to you for you to see it. Even though I can't control how you receive it, you might get a sensorial response that resonates with something within you. Maybe it is friction, maybe it's friction in your thoughts. Maybe it's friction in your relations. Maybe it's something third, but this is a meeting place that does not revolve around shame, guilt and silence. Does it make sense?

Mia

It makes good sense. It makes bodily sense, actually. I feel some kind of tension, actually, right now, in a good way.

Cath

That is mirror neurons, yeah!

On disability activism, resilience and the dilemma of organising

Valeria

Do you often collaborate with other people in the disability community? Is there an activist community in Denmark?

Cath

I often hear my peers and fellow disability activists talking about the dilemma of organising or not. The short answer to that question is yes, there is a community. I think that the community is very new. I am thinking of people like Olivia Dahl and Caspar Eric.

I am becoming more interested in organising myself. When we organise, we become more visible. I am more visible when I am part of the Cerebral Palsy Interest Organisation (CP Denmark). I also have a very close collaboration with the Disabled People's Organisations Denmark (DPOD). I also

sometimes call the Danish Disability Association (DHF), especially if they have a project that speaks to the body activism or artistic part of my practice, and we can collaborate. But I've also been very specific about my terms and my framework for collaborating with them. So yes, there is a community, and that is a lovely thing. At the same time, they also have an agenda, and I need to know exactly where I put my energy and where I put my values when I collaborate with someone as big as these organisations.

Caspar Eric once said, I cannot remember the exact wording, that maybe skepticism or resistance towards organising also has to do with the fact that all of us have been individually fighting for our lives and our educations, and maybe you have a certain relationship to your family or your parents, so a lot of that has become personal and individual, and it's often non-verbal and very traumatising. Then you might realise there are other people, communities or organisations. I really do understand that feeling of being alone.

And I think the cure to that feeling is to try to organise anyway. So, it is complex, it is a paradox.

Mia

When you talk, I think about resilience. Do you see resilience as something that involves both your everyday life and your practice? Is it something you work with or think about?

Cath

I think activism is a form of resilience. I think the reason some are activists and some people are not has a lot to do with resilience. Resilience is the denial of taking bullshit, and that is activism. I mean, that is trying to come up with an alternative to what you do not see as a viable solution. Growing up, it was very much a passion of mine to tell people about my condition and my needs and talk about the elephant in the room so that we could remove it. And then, on the other hand, you have younger disability activists saying, well, it is time that you educate yourselves.

Also, in my case, where does the responsibility [to educate people] lie? And okay, if we are moving towards this perspective of placing the responsibility on people without disabilities, how will the storytelling be? Am I willing to give

up my personal perspective on what I experience, with the risk of misunderstanding some points that are crucial to me? Am I willing to do that? I'm not sure. I would like to free more energy for us to talk about other things than my "otherness." But if the premise of doing this is that I give you guys the free space to actually interpret whatever you want about people with disabilities or about my situation, then that is also a high cost, at least from my perspective. And I think that is a super interesting discussion because we have people in the disability community saying, we're tired of being asked questions, and we just want to be with our communities without being asked questions all the time. And I'm like, Yeah, but I like being in control of my own narrative.

Some discussions about words can be very tiring too, like whether we should say "disabled" or "people with disabilities"... And then people end up not asking because they feel shame and guilt and all of that, and then we are back to square one. We need to keep talking about all this!

And, of course, I also have to make room for you to educate yourselves so that I can go to work, or I can do my grocery shopping, or I can make a dance performance because I have other stuff to do than educating you, even though I think it is great to sit here and talk.

I have never felt shameful, at least not around my disability, but these discussions can be very vulnerable; letting go and sharing things also implies a risk of failing... failing to elaborate properly or the risk of some things being misunderstood. I need to embrace my vulnerability while doing this work. That is vulnerability, and in letting go or giving someone else my narrative, and I mean that would go for all three of us, and it goes beyond my disability.

Mia

You once said we can do better than always needing the individual stories or examples, the testimony of the lived experience, to sympathize or to want change.

Cath

Yeah, and at the same time, I am the lived experience, and I offer myself as being the lived experience. But going back to vulnerability... How can we be vulnerable together? When can I allow myself to be vulnerable together with you? It is

through dancing, movement and art. But if we are always questioning and interrogating, I mean, we can do that, but that is not very conducive to being vulnerable. We are hardwired for community.

Valeria

You are also a member of the advisory panel for the Danish Cultural Analysis Institute. What is your role, and is disability on the agenda in the Danish cultural sector?

Cath

We had the second advisory board meeting yesterday. So, it's all very new. It is an analysis institute, so they want to collect knowledge and statistics across different cultural sectors (...) and write reports that can result in some positive change. You have to be recommended to become a member, which was a huge honour and joy because usually I knock on a lot of doors. You know, activists usually have to shout to be heard, which is a quirky premise... what happens when you cannot shout? And when I talk on behalf of others, how do I do that in a nuanced way, so people feel represented? And can I even do that?

However, accessibility is on the agenda at the Danish Cultural Analysis Institute. And aside from what we discussed verbally, I notice that just the fact that I am in the room is also important. Just like when I do something visual or bodily, like when I dance, or I do photo exhibits, I use my body to be present in debates. Disability as a topic is so far away for some people that just having someone with a disability in the room makes them think more about it. But it is still mind-blowing that, in 2024, people in grocery stores or public offices might still find it exotic that I can talk and that they do not have to talk to my PA instead!

Structural ableism and the limits of Universal Design as "one-size-fits-all"

Valeria

Would you say there is greater awareness in the Danish arts and culture sector around disability and representation compared to 10 years ago?

Cath

I want to say both yes and no, remembering that I am only speaking for myself. We are getting better at inviting people

with disabilities into our buildings and our discussions. So yes, there is a development. And I also think there is a development in terms of language and how we rephrase some things to accommodate certain people. But at the same time, we still have legislation that prevents us from adjusting or adapting buildings to the needs of people with certain disabilities. So, when a building is old, you cannot change it; you cannot accommodate it. But in other European countries, they are working around this and retrofitting old buildings! People are now challenging this legislation. And students of architecture are trained in accessibility and universal design, but they're going to work in a system that may not necessarily welcome these approaches. Challenging the system is something that needs to continue.

Valeria

Is Universal Design a concept you use or that has come around in your work?

Cath

My knowledge of it is limited, but when I am presented with it, I wonder whether it is possible, in these inner-city spaces, to apply a solution that's viable for all of us. It sounds like a utopia to me. Utopia is better than hiding people away in institutions. But this attempt to try and find a solution that fits all of us, at least in theory, feels provocative too. It skips the level of personal experience. I'm not comparable to my group of fellow people with cerebral palsy. This is super complex and super annoying, and it makes for a lot of friction!

I am very interested in friction. It can create friction when I say that I identify with my fellow people with CP or with disabilities, but we are also really different. We are individuals. How do you accommodate the balance between being an individual and also needing community and common solutions? I am not sure what the alternative is, but I would like us to discuss it. I do not think we talk enough about that, and I hope that people working with Universal Design would be open to the need to actually challenge this and find solutions together. Some people who talk about Universal Design use the example of the curb cut. They say it can be used by people with wheelchairs, strollers, skateboards and all of that. Yeah, but some parents with strollers have a different balance than I do, so the *angle* of that slope has to be different.

I can push myself up a slope, but the angle needs to be very low, lower than for someone who could push someone/something else. I'm just saying this from a non-practitioner's, but also a very practical point of view.

Conclusion

Disability studies literature has critiqued mainstream approaches to Universal Design for being a checklist-based, "disability-neutral" approach, promoting a generic good design for all (Guffey 2023; Hamraie 2016, 2017) while glossing over individual and structural frictions and the ongoing work of maintenance and re-design implicit in creating equal access (Carreras & Borsotti 2025). Critical approaches suggest that we need to reorient UD to be more attuned to disability justice, valuing the voices, agency, perspectives and creative contributions of people with disabilities (Hamraie 2017).

So, what can Universal Design scholars and practitioners learn from body activists such as Cath? In the following, we build on our conversation with Cath to reflect on this question and suggest some principles and practices that could be adopted and used as inspiration for creating change.

Learning from body activism: key points for UD practitioners and organizations

→ Engaging the senses: Body activism challenges the historical public invisibility of people with disabilities, and in doing so, experiments with new ways to explore issues that are still considered uncomfortable. Engaging the senses is used in body activism as a strategy to achieve multiple ends: giving visibility to the broad spectrum of bodies and the diversity of their "functional variations", as Cath refers to them, and actively engaging with taboo topics, rather than shying away from them.

→ Ethical complexity: In our conversation, we also touched upon the complex ethics of engaging people with disabilities as "educators" of non-disabled people, participants or user-groups, as there is a fine line between participation and exploitation. This balance concerns work, energy and economic compensation. In line with

this, we discussed the dangers of "othering," that is, portraying someone or a group as fundamentally different. To encompass these ethical complexities, Cath talks about the potential of embracing both friction and vulnerability in the process and to open with the concerns they may raise.

→ Prioritize new encounters: Accessibility is collaborative work and requires the ability to see, understand and empathise with non-normative needs and skills. Facilitating and supporting regular (e.g., institutional or organisational) spaces for new encounters between people with 'mixed abilities' is a way to explore needs and mutual connections. In particular, we suggest co-creating workshops, academic talks, and other events to highlight the perspectives of disability activists and disabled people actively working for inclusivity. But mind the 'minority tax', which is the tendency to burden minoritised people with tasks related to diversity and inclusion, and ensure that people engaged in these initiativesare given the proper compensation and support for their participation.

→ Acknowledge friction. Friction is a daily companion for most people with disabilities – and often also for people in their care network. It is important to acknowledge that friction is part of everyday life. Consider how friction can manifest differently for different people, and rather than "fixing" it, consider ways to reduce the disabling aspects of relational, physical, and institutional friction. How does friction manifest in digital systems, in the built environment, in services, in institutions, and in organizational practices? How about in interpersonal relationships and in public or private discussions and representations of disability and accessibility?

→ Bring back the senses! Engaging different senses should be a crucial part of universally designed built environments, as well as services, both digital and physical. Rather than just supporting different 'needs,' how can we design to engage and support a variety of senses – also in frictional ways? Engaging the sensorium is of crucial importance in architecture and design, as well as in fields of practice and research

such as education, workplace wellbeing, healthcare, museums, libraries and other cultural institutions. However, sensory engagement and sensory accessibility are not directly referenced in the various versions of the principles of UD.

→ A focus on individual stories can distract from collective social responsibility. Presenting "lived experiences" of people with disabilities experiencing barriers seems often to be the prerequisite of institutional and media engagements with the subject of disability, to foster compassion and a desire for change. This poses the risk of de-emphasizing both the agency of people with disabilities and broader social and institutional accountability.

→ Vulnerability is ok. Talking about taboo topics can show our blind spots or make us feel very exposed. Disability visibility initiatives should create a safe and comfortable environment for being vulnerable together. A precondition for breaking taboos is to start talking about them. This means to overcome the discomfort or fear of asking about something difficult. So, let us follow Cath's principle: Let us start talking!

Cerebral palsy (CP) is the most common diagnosis among children with disabilities (Krigger, 2006), and it refers to a complex group of physical and neurological conditions that permanently affect body movement and muscle function. Some individuals might need support and equipment for difficulties with walking and/or certain types of movements; others might need lifelong support, and some might need limited or no support. About 17 million people worldwide live with CP, and between 8,000 and 10,000 of them are in Denmark (Elsass Foundation, 2019).

Epilogue A Tool for Change

Mia Høj Mathiasson, Thomas Skovgaard Worm,
Leif Hemming Pedersen, Valeria Borsotti, Roberta Cassi

This anthology explores Universal Design (UD) as a tool for change across a wide range of domains, disciplines, and practices. The contributions collectively position UD as a dynamic and evolving concept that has expanded from its origins in architecture and disability rights. In the following, we draw central insights from the chapters and reflect on the contributions in light of the overall scope.

A central theme across the chapters in this anthology is the shift from a primarily rights-based approach to a more value-driven orientation. Historically, UD has been promoted through disability rights and anti-discrimination frameworks. Today, it also reflects approaches to inclusivity, diversity, and disability in policymaking and design. In line with crip theory and STS frameworks, this value-driven orientation emphasises the importance of language and of centering the bottom-up contributions and perspectives of people with disabilities. Moreover, it implies that UD requires continuous reflection on whose needs are addressed and how inclusion is defined and redefined.

Another important contribution of this anthology is its interdisciplinary engagement with UD. The chapters show how UD operates across fields such as design, sociology, education, technology, and activism – highlighting the necessity of collaboration to address complex societal challenges and shaping how inclusion, participation, and human diversity are addressed. The focus on interdisciplinarity is not a coincidence but a deliberate choice behind the work of the Bevica Foundation and the UD Hub. As argued by Camilla Ryhl in Chapter 1: "Universal design is embedded in the UN Convention on the Rights of Persons with Disabilities (CRPD) precisely as an interdisciplinary concept. The CRPD defines it as "the design of products, environments, programmes and services (...)". The CRPD's definition underscores that inclusion is relevant across all sectors and all disciplines. This is a perspective that lies at the very heart of the research network". In the present volume, the interdisciplinary collabo-

ration within the research network allows for different positions, theoretical perspectives, and practice approaches to explore, test, and challenge UD as *a tool for change*.

The idea for this anthology and its theme – "Universal Design as a Tool for Change" – was conceived at a meeting in the research network in March 2024. A key perspective guiding the anthology has been that all chapters should be interdisciplinary and collaborative works. In practice, this means that chapters are written by two or more authors representing different disciplinary perspectives. The interdisciplinarity of the research network has enabled diverse perspectives on applying and "thinking with" UD across research fields and disciplines.

Through nine chapters, divided into four sections, this anthology presents diverse perspectives on UD. Section 1 centers on the work of the Bevica Foundation, the UD Hub, and the Interdisciplinary Research Network, which together seek to promote UD as a vehicle of change from different levels and angles. Section 2 zooms in on the theoretical underpinnings of UD and reflects on the future development of design education, in light of historical readings. Section 3 explores how UD, as a tool for social change, can be employed in practice and highlights the need for more inclusive mindsets at both micro and macro levels. Section 4 presents future perspectives on UD and inclusive change by focusing on the critical and creative practices of disabled researchers, artists, designers, and activists, reimagining new practices and approaches.

Approaching the anthology in this way has allowed us to bring together a spectrum of disciplinary and interdisciplinary perspectives on UD. Moreover, it has allowed us to highlight the strengths, difficulties, and ambiguities that can arise when researching UD or applying UD in different research contexts. Building on these insights, the anthology approaches UD as a "thinking tool," enabling researchers to reflect on and reimagine UD in relation to their respective disciplines and fields of research. The goal has not been to propose a new unified framework on how to use UD as a tool for change, but rather to present new ways in which UD can advance equity and inclusivity in different domains (see Chapters 6 and 7 in particular) while also pushing for

integrating more disability-led approaches into UD, taking into account disability activism and disability-centered design (see Chapters 8 and 9).

Although the anthology is situated in a Nordic context, UD emerged in the USA and has been developed in close relation to disability movements, which have been central in challenging and reshaping the concept over time. For this reason, the theoretical underpinnings of UD across the anthology are heavily influenced by North American scholars, most notably Aimi Hamraie, and the engagement with an American UD tradition. Building very much on a design approach developed in the US, the international and Danish researchers and activists contributing to this anthology have explored how the original principles and assumptions underlying UD are relevant and can evolve within a welfare and societal setting quite different from the US format. Still, in hindsight, the anthology's focus on theories originating in the US may unintentionally have overshadowed the important and ongoing work on UD in the Nordic countries and Europe in general.

Applying a US-centred understanding of UD to a Nordic welfare model can be challenging, if not problematic, due to contextual differences. Some of these are obvious and relate, for instance, to variations in governmental structures, taxation schemes and welfare approaches. Others are more subtle and spring out of collective norms and values, as well as the homogeneity and diversity of populations. This does not mean that issues of inequality are absent in Nordic welfare states, but rather that they may take different and not so visible forms. In fact, in Denmark, which is often celebrated for its equitable society, issues related to lack of accessibility, ableism and taboos around disability are still very much abundant. The importance of creating new conversations about disability and of centering disability visibility is clear in the work of Danish body activist Cath Borch Jensen, who is interviewed in Chapter 9. Visibility is a strategy, as well as a sensoric and emotional focus for understanding. As Cath says, "sometimes, we need to feel and have a somatic and emotional experience to find new words and new insights and to develop new ways of making a community of being together".

By using UD as "a tool for change", this anthology seeks to cast light on the inequalities, problems and dilemmas that remain in designing or reimagining a society "for all". UD is not in itself a solution to these problems, but when used reflexively and in interdisciplinary collaborations, it can be a (thinking) tool for transformative change processes. What stands out throughout this anthology is that UD requires ongoing reflection, collaboration, and engagement with different perspectives. In this sense, UD can function as a way of thinking that draws attention to differences and challenges taken-for-granted norms.

By emphasising the concept of "*design*" in "designing for change," this anthology also suggests a change in focus from product to process. This implies again that UD is a means to an end – namely, the creation of changes towards a more equitable and inclusive society. This also means that the scope of UD extends beyond its founding disciplines, architecture and design. It holds clear value in fields such as pedagogy, welfare services, technology development, culture and governance. We argue that UD can be applied across every aspect of a designed society and everyday life, benefiting individuals, groups, and society at large. Future research should explore the types of change processes in which UD can be applied. It would also be valuable to test concrete UD methods in contexts where it has not yet been considered. Such efforts can expand the scope of UD and further clarify its role as a driver of change.

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Akrimar Tongkaew is a PhD researcher at DTU, working on the Technology Leaving No One Behind project. Her research focuses on fostering and measuring an inclusive mindset in design and engineering education. Having a background in psychology and learning design, she integrates research, teaching, and practice to promote inclusivity in design and education.

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Barbara is a postdoctoral researcher in the Department of Nordic Studies and Linguistics at the University of Copenhagen and part of the European research project NewWorkTech. Her work explores how disabled people use and invent assistive technologies, as well as the barriers to and opportunities for access in different social settings. Her research uses artistic and ethnographic methods to study experiences of access and examines disabled people's creative uses of technology through multimodal and multisensory interaction.

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Camilla Ryhl is research director at the Bevica Foundation and head of the Universal Design Hub. She is a trained architect with a PhD in sensory disabilities and residential architecture. She specialises in universal design and sensory architecture. She has previously researched and taught at the Danish Building Research Institute (now BUILD)

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Cath Borch Jensen
Disability activist

Cath Borch Jensen is a body activist and uses a wheelchair due to birth-induced cerebral palsy. She is a cross-media conveyor of #whatwedonttalkabout, integrative dancer, and mediator of contemporary art. Her bodily-rooted cross-media practice explores and challenges our human ways of relating to, interacting with, and communicating with and about one another.

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Chapter 5

Universal Design: A Shift from or an Extension of Functionalism?

Christine Bjerke and
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Note on translation
Unless otherwise stated, all the translations used in this chapter are by the authors.

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Chapter 9

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Colophon

Universal Design as a Tool for Change

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