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Exploring the person-environment-occupation model across theory and practices: Two empirical case studies

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Universal design

Cross-disciplinary perspectives in theory and practice

Frandsen, Anne Kathrine; Bonfils, Inge Storgaard; Olsen, Leif

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Universal design

**Cross-disciplinary
perspectives in theory
and practice**

**Edited by Anne Kathrine Frandsen,
Inge Storgaard Bonfils and Leif Olsen**

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Preface

Universal design is first and foremost a value-based concept based on a holistic and inclusive view of humanity. It represents a new approach to understanding how we design and develop our society so that everyone feels equally included –regardless of ability. For more than 150 years, the Bevica Foundation has endeavoured to ensure that people with disabilities have the same opportunities as everyone else to contribute to 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.

In Denmark, we are committed to honouring the fundamental social contract that underpins our adherence to the UN Sustainable Development Goals (SDG), Agenda 2030 and the UN Convention on the Rights of Persons with Disabilities, which the country ratified in 2009. The convention defines universal design as a core design principle to be applied to products, environments, programmes and services, while Agenda 2030, with its core pledge to Leave No One Behind in the sustainable development of our society, also calls for us to use universal design as a lever. This is why the Bevica Foundation works towards making universal design a fundamental premise for the way we design our society, and to ensure that the concept is indispensable for all professionals, professional environments and professional processes that affect the framework around life as it is lived.

We believe universal design offers a potential for a paradigm shift in the way we understand ability, disability, and the design of our society. We believe universal design can be a decisive lever for securing the pledge to Leave No One Behind in sustainable development.

With this in mind, in 2020 the Bevica Foundation established the Universal Design Hub, the purpose of which was to facilitate an interdisciplinary research network. This network aims to develop an interdisciplinary field of knowledge around universal design and

how it can serve as a lever to comply with the pledge to Leave No One Behind in sustainable development. The network's members represent various universities, schools of architecture and design and university colleges, and this anthology is the network's first joint publication.

The anthology is the result of many open discussions and debates, where members of the research network have primarily sought to arrive at a mutual understanding of each other's professional standpoints. From here they have taken the first steps towards openly discussing how the concept of universal design can be interpreted and put into operation and practice in a Danish context, and across disciplines and forms of practice. Both the individual chapters and the anthology as a whole offer interdisciplinary approaches, new understandings, challenges and invitations for further developing and implementing universal design in Denmark.

The chapters in the anthology have been peer-reviewed by recognised researchers from the Nordic countries stemming from scientific backgrounds in social science, rehabilitation to architecture and design. We are very grateful for their valuable input.

Universal design is increasingly finding its way onto the agenda in Denmark and is being implemented and interpreted in different disciplines and fields of knowledge as well as in research and in practice.

It is an important concept and an essential one if we are to succeed with a paradigm shift in our approach to designing our society. Interpreting and practising universal design in Denmark requires new knowledge and a fundamental rethink in both research and teaching. That is why we are delighted that the Bevica Foundation's interdisciplinary research network has produced this anthology, which can serve as a starting point for both teaching and debate.

Camilla Ryhl
Research Director,
Universal Design Hub, the Bevica Foundation

1.0 Universal design allows everyone to take part

**Anne Kathrine Frandsen, Inge Storgaard Bonfils
and Leif Olsen**

Invitation to an interdisciplinary collaboration on developing and disseminating universal design

The concept of *universal design* is built upon the fundamental value that all people should be able to participate equally in social activities and society's institutions. Thus, the core value in universal design parallels the pledge of the UN's Sustainable Development Goals: Leave No One Behind, (LNOB) (UNSDG, 2022). Universal design is intended as an epoch-making means to fulfil the ambitious goal of developing and disseminating designs for all types of solutions to enable all people, in all their diversity, to access and participate in all conceivable and desirable social activities. Desirable social activities occur in all sectors and types of social arenas in everyday life, such as education, work, culture and civil society. Universal design is a means of realising the possibility for each person to flourish individually and socially in communities at local, national and global levels. Universal design, as a concrete means, consists of designing and constructing buildings, infrastructure, products, surroundings, schemes and services etc. so that they can be used by all people without the need for later, individual or local adaptation or specially designed assistive devices, as formulated in the UN Convention on the Rights of Persons with Disabilities, which was ratified by Denmark in 2009 (Danish Institute for Human Rights 2021).

Intuitively, the idea of universal design may sound simple and straightforward: designing the world's material and social solutions so that everyone within a wide range of individual and social contexts can use them, regardless of disabilities. That may also sometimes be the case, but the frequent failure in actual product or building development to adopt universal design elements show that it is challenging to put the concept into practice. With this anthology, we invite you to join the interdisciplinary and cross-sectoral collaboration to find ways to transfer the concept of universal design into practice. This will require, among other things, partnerships based on holistic understanding and knowledge of human diversity in individual and social contexts when developing social and physical

solutions. Therefore, there is a need for diverse types of knowledge and cross-disciplinary collaboration in the development of universal design. Developing and disseminating universal design requires collaboration across disciplines and sectors, users and producers, decision-makers, organisational and funding structures and research traditions. All these aspects of universal design need to be explored and knowledge developed to generate engagement and action to make universal design a reality and realise the global goal of Leave No One Behind.

This anthology aims to help stimulate this cross-disciplinary and diverse evolution and dissemination of universal design. The anthology serves as an invitation to interdisciplinary collaboration to develop the concept and practice of universal design and stimulate the sharing of experience and knowledge.

1.1 The importance of interdisciplinary collaboration for the development and dissemination of universal design

We hope this invitation to interdisciplinary collaboration on the development and dissemination of universal design will generate a ripple effect. The chapters of the anthology are good examples of how interdisciplinary collaboration can drive engagement with and innovation of universal design in theory and practice. Creating new cross-disciplinary collaborations on complex tasks like universal design development can be difficult. These do not emerge naturally and do not always develop harmoniously (in well-coordinated processes or within well-defined goals) across sectors or disciplines. Hence the importance to share knowledge of processual challenges and experience-based usability issues across sectors and disciplines, and thus strengthen the basis for universal design innovation in both theory and practice. The chapters of the anthology exemplify such collaborations.

They deal with universal design – a design that is for everyone, including people with impairments and disabilities. We set out in the Danish context, where Bevica Fonden’s Universal Design Hub (www.universaldesignhub.dk) has provided a network for the authors of this anthology to meet across different disciplines and sectors. Bevica Fonden’s Interdisciplinary Research Network has been a crucial framework for this joint project. It has supported collaboration within the individual author groups and across the groups at joint seminars where the author groups were given the opportunity to develop their various contributions through dialogue. In our experience, this has provided a unique and crucial framework for the development of collaboration on universal design, and we see the creation of such frameworks for interdisciplinary and cross-sectoral collaboration on universal design as essential.

The broader perspective of the anthology is to move from national to international cooperation and stimulate collaboration across national borders. We believe it is important to stimulate interdisciplinary and cross-sectoral collaboration on the development and dissemination of universal design locally, nationally and internationally in order to transfer universal design into well founded and broadly adaptive practice. In other words, there is good reason to get started with cross-disciplinary collaboration on the development and dissemination of universal design on both small and large scales, locally, nationally and internationally.

The chapters of the anthology have been produced in a cross-disciplinary collaboration between researchers in the research network, who come from different research disciplines, sectors and institutions, as listed in the author list. The authors describe and discuss how understandings of universal design and human diversity, such as impairments and disabilities, can be brought into play and can contribute productively to the development and exploration of universal design. The authors have been asked to include examples of universal design in practice and discuss the values, worldviews, applications, interactions and outcomes of universal design in practice. A few of the chapters draw on authors outside the network.

Universal design is a concept with multiple dimensions. It is both inspiring and challenging to put the idea into practice so that products, buildings, digitalisation, social initiatives, etc. can accommodate human and social diversity. The concept of universal design and its inherent values can help dissolve categorisations of ‘them and us’ and create new insights and solutions that contribute to an inclusive environment and the conditions for everyone to participate in society’s activities.

In cross-disciplinary collaboration on universal design, there is no way around working with the diversity of the concept and the different professional perspectives included in both the idea and the actual collaboration in question. This is also reflected in the chapters of the anthology and has been the focal point of the cross-disciplinary dialogues during our work on the book. In this introduction, we have chosen to focus on the diversity of the concept of universal design along with a number of related concepts that are important to keep in mind and actively include in order to support cross-disciplinary collaboration on universal design. The same applies to the two crucial dimensions of universal design, namely the fact of human diversity and the furthering of equality of opportunity. We therefore introduce different understandings of the concept of *disability* that contribute to an understanding of human diversity that is sufficiently complex to allow the true integration of that diversity with the idea of universal design. Being mindful of the underlying values and presumptions is fundamental, we believe, to the practice of universal design. Thus, we discuss the value criteria that are included in different phases of the development, dissemination and application of universal design. We see evaluation and evaluative questions as an important part of collaborating on the development, dissemination and application of universal design.

1.2 Universal design values diversity – and is a diverse concept

The American architect Ron Mace is recognised as the originator of the concept of universal design, which he defined in 1985 as follows:

Universal design is “a way of designing a building or facility, at little or no extra cost, so that it is both attractive and functional for all people, disabled or not.” (Hamraie, 2016)

Ron Mace, himself a wheelchair user, had found that requirements to make the built environment accessible, as formulated in legislation and standards, had an inherent stigmatising effect. Accessibility was created via specialised solutions that catered to specific needs, thus exhibiting the users of these solutions as different.

From the 1960s onwards, the fight for equal rights for people with disabilities gained strength in the US, alongside the civil rights movement's struggle for equal rights for black citizens, people of colour and other minorities. Out of this struggle emerged such concepts as *barrier-free design* and *accessibility* to ensure equal access to society's physical environment, which were written into legislation and building regulations, comparable to the accessibility requirements written into the Danish Building Act in 1972 (Bekendtgørelse af byggelov, 1972).

With the concept of *universal design*, Mace wanted to create a design concept that, unlike the concepts of barrier-free design and accessibility, did not operate with an inherent notion of 'them and us' but included 'everyone' in the design of products and buildings. Since then, the concept of universal design has been widely adopted and is included in the UN Convention on the Rights of Persons with Disabilities with the following definition:

“Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.” (UN, 2021)

In the years after the concept of universal design was first formulated, it suffered from a lack of concrete criteria and was difficult to implement in design and construction practice (Story, 2001). To address this issue, Ron Mace, along with a group of architects, product designers, engineers, and environmental design researchers, formulated seven principles of universal design with a series of subpoints to make designing based on the concept manageable.

TABLE 1. THE 7 PRINCIPLES OF UNIVERSAL DESIGN:

- 1 Equitable use**
- 2 Flexibility in use**
- 3 Simple and intuitive use**
- 4 Perceptible information**
- 5 Tolerance for error**
- 6 Low physical effort**
- 7 Size and space for approach and use**

Ron Mace et al., 1997

The concept is used in the UN Convention on the Rights of Persons with Disabilities and is incorporated into Norwegian anti-discrimination and building legislation.

The concept has since been criticised for being instrumental and focusing solely on practicality (D’souza, 2004), and the use of *universal* in the concept has been problematised as it can imply a blurring of attention to human diversity and a focus on the lowest common denominator (Imrie, 2012).

A later definition of universal design formulated by Mace’s heirs, Steinfeld and Maisel, seeks to address this critique by focusing on

what the design concept is trying to achieve and the process that can lead to equality and inclusion:

“Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation.” (Steinfeld & Maisei, 2012)

With this definition comes a concretisation with eight goals:

TABLE 2. THE 8 GOALS OF UNIVERSAL DESIGN:

- 1 Body Fit**
(Accommodating a wide range of body sizes and abilities)
- 2 Comfort**
(Keeping demands within desirable limits of body function and perception)
- 3 Awareness**
(Ensuring that critical information for use is easily perceived)
- 4 Understanding**
(Making methods of operation and use intuitive, clear, and unambiguous)
- 5 Wellness**
(Contributing to health promotion, avoidance of disease, and protection from hazards)
- 6 Social Integration**
(Treating all groups with dignity and respect)
- 7 Personalization**
(Incorporating opportunities for choice and the expression of individual preferences)
- 8 Cultural Appropriateness**
(Respecting and reinforcing cultural values, and the social and environmental contexts of any design project)

Steinfeld and Maisei 2012

Not only do Steinfeld and Maisel, in their definition of the concept, articulate the process that leads to universal design, they also add more nuances to what universal design entails with the concretised eight goals of universal design.

Unlike the seven principles of universal design, which focus solely on design as a tool to ensure participation for all, the eight goals of universal design increase the level of ambition. Only the first four goals address the shaping part of the design process. Goal 5: *Wellness* and Goal 6: *Social inclusion* articulate an aim to include in universal design more than the idea of equal participation; supporting social inclusion and promoting health and wellbeing are also part of the ambition.

Goal 7: *Personalisation* and Goal 8: *Cultural appropriateness* establish an awareness of the importance of individual, social, geographical and cultural contexts in determining what universal design entails. As individuals, we have different functional abilities, needs and preferences and thus different requirements for what constitutes good design. Social context and cultural background influence what we as individuals and groups find important. What may count as universal design in a hospital in the jungles of Congo may not work for a hospital in Sanaa, Yemen, or in Copenhagen.

The original seven principles of universal design, despite the wish to define a design that is usable by all, risk supporting a narrow focus on size and shape and end up being interpreted as standardised solutions and checklists. Steinfeld and Maisel's eight goals emphasise that process and context must also be included, and that universal design cannot be achieved with standardised solutions but requires immersion in local practices and places to achieve the ambition of equal opportunity across human diversity.

Inclusive design

Designer Roger Colemann was a key player in the development of a parallel concept of design in the UK during the 1990s. This design concept, labelled *inclusive design*, was based on the understanding that the abilities and needs of product users are diverse and change throughout life.

“The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible ... without the need for special adaptation or specialised design.” (British Standards Institute, 2005)

Inclusive design differs from universal design in that it is based on product and service design and not, as with universal design, on architecture and the built environment. Inclusive design focuses more on the diversity of mainstream users and accommodates that diversity in a product rather than the special needs of people with disabilities (Heylighen et al., 2017).

Design for all

In continental Europe, the EIDD-Design for All Europe Network (formerly The European Institute for Design and Disability) was established in 1993, consisting of public and private organisations (Ryhl, 2009). The goal of establishing the network was to increase the inclusion of people with disabilities. Still, the objective has embraced contemporary trends with a general focus on the quality of life for everyone through the concept of *Design for All*. Design for All did not operate with a definition as did the other design concepts in the field, but in 2004 a declaration was formulated:

“Design for All is design for human diversity, social inclusion and equality. This holistic and innovative approach constitutes a creative and ethical challenge for all planners, designers, entrepreneurs, administrators and political leaders.” (Stockholm Declaration, European Institute for Design and Disability (EIDD 2004))

Until around 2010, Design for All was the most commonly used concept in Denmark, primarily in the field of industrial design. In recent years, universal design as a concept has gained momentum and is, for example, included as one of the social sustainability criteria in the DGNB sustainability certification system¹ (DGNB Manual New Buildings and Major Renovations 2020).

1.3 The importance of context for universal design

Thinking and realising universal design requires an awareness of the context into which ideals and principles are translated. This anthology is based on the political, social, cultural, material and geographical conditions and contexts that prevail in Denmark. The chapters contain examples of the opportunities and challenges that can arise when realising universal design in practice. Inger Marie Lid distinguishes between three levels of analysing and understanding this process (Lid, 2020). On a macro-level, universal design is connected to principles, values and strategies articulated in human rights, such as the UN Convention on the Rights of Persons with Disabilities, and to how a society is governed and organised. In a Danish context, for example, democratic processes, legislation and the organisation of the welfare state are critical contexts for understanding the scope for translating universal design into reality. At the meso-level, universal design is expressed in, for example, specific legislation, regulations, guidelines, and the strategies and boundaries of government services for people with disabilities. Here, the interplay between universal design principles and compensation schemes for people with disabilities can impact the practical realisation of universal design. To what extent is it legally possible to offer support for, for instance, the remodelling of a home to meet the needs of a person

1 Deutsche Gesellschaft für Nachhaltiges Bauen.

with reduced mobility? Or are there rules that require homes to be built and designed with universal design in mind? On a micro-level, universal design can be about the perceived quality, usability and accessibility of a building, technology or services.

The above examples illustrate how putting universal design into practice involves recognising Danish society's formal rules and frameworks. It also involves considering the informal aspects, such as norms and values influenced by historical and social processes. These factors significantly shape the opportunities and obstacles for realising universal design in practice. Historically, Denmark has had a long tradition of segregating people with disabilities from the rest of society. Until the 1980s, people with intellectual disabilities, severe mental illness or significant limitations in their physical functioning lived in institutions, segregated from society. The societal impact of this is difficult to assess from a contemporary perspective. However, many material and immaterial aspects of Danish society have been shaped by the absence of visibility and participation, as well as the lacking recognition that individuals with disabilities have the right to and should have opportunities for equal participation. People with disabilities have been 'out of sight, out of mind' when building new homes, creating jobs, and designing technological solutions and services. The consequences of this are experienced today by individuals living with disabilities in Danish society – and by everyone else, who misses out on the diverse range of resources that people with disabilities, just like anyone else, can contribute. The Danish Society has not been developed with them in mind, but rather based on a notion of normality where they have been excluded from the concept of *normal*. This leads us towards a closer exploration of the understandings that underlie the phenomena of disability and impairment, which are crucial in universal design.

1.4 Disability, impairment and human diversity

Disability is a diverse and contested concept that can be understood from different angles. It is also a concept that is increasingly being replaced by notions of disability, impairment or varied ability, with reference to human diversity and a move away from a ‘them and us’ categorisation. The authors of this anthology write from different research traditions and disciplines and therefore use different concepts. As editors, we have chosen to recognise this diversity of terminology, as it reflects the interdisciplinary processes that each chapter results from. In social and health science research, there has been an ongoing discussion about how disability, functional ability and functional impairment can be understood and conceptualised. This discussion has been strongly inspired by leading players from the international disability movement, among others, and has spread to other disciplines and research areas, including universal design and related concepts. With reference to this discussion, we will briefly outline the tensions between conceptual understandings that are being debated in both research and more general contexts. We do this with reference to theoretical models for understanding the phenomenon of disability/functional impairment – so-called disability understandings (Bonfils et al., 2013).

From a biomedical perspective, disability is explained in terms of “*human biology in its genetic, physiological, biomolecular, neurobiological and hormonal circumstances*” (Haegele & Hodge, 2016). In this biomedical understanding, disability is perceived as a consequence of illness or injury, which can create difficulties for the person in everyday life. This means that disability in this perspective is closely linked to biological and psychological understandings of what deviates from the norm, in a diagnostic sense.

Social models for understanding disability emphasise the individual human being as a social being developed and shaped in interaction with the social and cultural environment. Social interaction and responsiveness are central features of human life (Norvoll, 2013). The social models provide a basis for critiquing the narrow

focus on the individual within the biomedical model as a reductionist perspective on human beings. Social models focus on the interaction between the individual and society. One of the basic conceptual developments in social modelling is the distinction between impairment and disability. Impairment is understood as physical, psychological, intellectual and sensory limitations in functional ability, where *disability* points to the resulting limitations and barriers that the person encounters in interacting with the environment (Bonfils & Olsen, 2016). This understanding is reflected in international documents such as the UN Convention on the Rights of Persons with Disabilities and the WHO's International Classification of Functioning, Disability and Health, ICF (Maribo et al., 2022).

The UN Convention on the Rights of Persons with Disabilities states in article 1:

“Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.” (Institute for Human Rights 2021)

ICF is built around a conceptual framework where a person's functional ability is understood in light of three areas:

- 1 Impairments are problems in the body's functions or changes in the body's structure
- 2 Activity limitations are problems in performing certain activities
- 3 Participation limitations are problems with participating on an equal footing in different life situations and thus being *left behind*, see LNOB.

In addition, contextual factors are assessed in the form of environmental and personal characteristics. An example of the latter could be the person's ability to master individual and social activities.

These are seen as factors that promote or restrict the person's ability to participate in the given context.

Socially created barriers can manifest themselves in subtle ways. This may be in the physical layout of buildings, transport systems, or in the material design of products and artefacts, which are often developed based on an implicit assumption of what constitutes human functionality. It may be norms and notions of *normality* that mark the boundaries of what is perceived as normal and expected in a given society. This includes behaviour, conduct, appearance and physical ability. Understandings of disability and functional impairment are thus embedded in cultural and historical processes of defining *normality* and *deviance*, as the boundaries of normality are guiding principles for the societal and social organisation of people's lives and opportunities (Grue, 2016). For example, the fact that a student is referred to a special school with reference to an autism diagnosis can be seen as an expression of the current societal organisation of the boundaries of the public school's learning space and community.

Societal values and dominant discourses influence people's understandings of who is categorised as normal or deviant. In critical disability studies, the term *disablism* is used to describe discriminatory, oppressive and degrading behaviour based on the belief that people with disabilities are less worthy than other people. In continuation, the term *ableism* is also used as an expression of the subtle processes through which notions of the average body are constituted as the norm for ideal people (Bredgaard et al., 2020). An example of ableism is that S-trains in Copenhagen are equipped with ramps that require manual operation by train staff to allow a wheelchair user to enter and exit. The design of the S-train is based on an understanding of normality for the *able-bodied* and, at the same time, the *disability-accessible* ramp contributes to portraying people in wheelchairs as needing help and dependent on the train staff.

Within British disability research, the concept of *disablism* has also been further explored through a focus on avoidant behaviour. The term *aversive disablism* refers to a behaviour wherein one wishes to avoid something. For example, when people without disabilities try to avoid contact with people with disabilities (Bredgaard et

al., 2020). These perspectives can open our eyes to how prejudices – in the sense of preconceptions – are embedded in perceptions of people with disabilities (when, for example, people living with a disability are met with lower expectations). But also, to how the design of most physical products is based on a notion of normal body functioning. To sharpen both a societal understanding of the importance of universal design and the practical execution of universal design, it is essential to develop more robust theoretical and methodological tools for analysing and evaluating how products, technologies, buildings, etc. may be developed to genuinely create inclusiveness for human diversity.

1.5 Values in universal design and evaluation

The fundamental goal of universal design is that products such as buildings, transport, public spaces, websites, social initiatives, etc. should be usable by all people, based on the value of inclusiveness. To understand whether this fundamental value is successfully realised in a given context, it is essential to ask evaluative questions about universal design: Can all people use it? The question can be nuanced in many ways, for example by asking: What do different people, including people with disabilities, get out of using the products in question? And what do family, friends, employers and society gain from that?

However, there is a need to establish an evaluation practice, culture and capacity in evaluating universal design work and products. This applies, for example, to architecture, which sets the long-term physical, aesthetic and logistical framework for people's everyday lives in their own homes, or when engaging in shopping, education, cultural events, working life, etc. Here, evaluations are rarely carried out to assess whether the goals and values associated with specific forms of design in architecture, digital solutions, education programmes, etc. have been realised in practice for the diversity of

people who will use and live with the results of the design. These are disciplines and topic areas where there is great potential in developing and conducting evaluations of design, both universal design and non-universal design, which can contribute essential knowledge about the potential of universal design and its translation into practices that make a positive difference for a diversity of people.

There is a need to discuss how to create a relevant evaluation practice, culture and capacity in universal design, including architecture and construction. This can be achieved in dialogue with other disciplines that have established evaluation traditions, experience and knowledge. For example, a practice for and an institutionalisation of evaluation has developed in areas such as public administration and social initiatives. It is possible to incorporate within universal design the lessons learnt in those sectors, although they are, of course, far from exhaustive in terms of evaluating the practice of values associated with universal design and LNOB.

Experience gained through involving users in planning future constructions, products and services needs to be integrated into the development of an evaluation process that includes different user perspectives.

No one discipline or field of study holds all the keys to evaluating universal design, so there is a great need for interdisciplinary collaboration to find evaluation methods and, not least, to define the core values that are crucial to assess in relation to universal design.

1.6 Introduction to the chapters of the book

Given that we recognise the challenges of developing universal design in practice as a task requiring interdisciplinary approaches, developing all chapters through interdisciplinary collaboration has been a guiding principle.

The principle has also been applied to the editorial team behind the anthology, who are authors of this introductory chapter (1) and

the concluding chapter (11), ensuring an interdisciplinary approach throughout the anthology. The editors are Inge Storgaard Bonfils (with a background in political science), Leif Olsen (with expertise in sociology), and Anne Kathrine Frandsen (with a background in architecture).

Chapter 2, Residential architecture as a prism for views of humanity, sheds light on institutional and residential architecture for people with intellectual disabilities, from when the large asylums were established at the end of the 19th century to today's residential facilities built under the framework of the Public Housing Act, and discusses how we should understand universal design in relation to this type of housing. The chapter is written across the research traditions of social sciences and architectural disciplines by Inge Storgaard Bonfils, PhD in political science, specialising in disability policy, social work, and rehabilitation, and Anne Kathrine Frandsen, PhD in architecture, focusing on universal design and construction processes.

Chapter 3, Product design – from ableism towards more inclusive design, discusses the implicit understanding of human bodies and functionality behind the design of the products we surround ourselves with in everyday life. This chapter introduces design concepts that contain a broader understanding of human diversity and design methods that seek, through involvement and co-design, to take human diversity into account. The chapter has been written across social science and design research traditions by Eva Brandt, professor of Social Design, Signe Mårbjerg Severin, designer, and Inge Storgaard Bonfils, PhD in Political Science.

Chapter 4, Towards digital accessibility: Disability, culture and social justice continues the critique of existing design approaches and focuses on how a participatory design approach that includes users with disabilities can change the understanding of accessibility from a matter of merely meeting a set of standardised requirements to contributing to social justice. The chapter was written by the authors Barbara Nino Carreras, a PhD student at ITU (IT University of Copenhagen) with a socio-technical science approach, Frederik Gybel Jensen, a speech and language therapist and PhD student at Rigshospitalet and University of Copenhagen, Jesper Bentil Holten, a politi-

cal representative from Dansk Blindesamfund (Danish Association of the Blind) focusing on digitalisation, and Leif H. Pedersen, PhD in media and media development at RUC (Roskilde University).

Chapter 5, Dependency sensitivity via universal design, follows Peter's journey on the morning train from his home to his workplace. It provides insight into his perspective and experiences as a wheelchair user on this journey. The authors Marcus Tang Merit, a sociologist, Emil Ballegaard, PhD student in architecture, Masashi Kajita, associate professor in architecture and Eva Brandt, a professor in social design, present an understanding of universal design as a sensitivity towards dependencies rather than solely concrete physical solutions.

Chapter 6, Universal job design, presents a new theoretical concept of designing jobs based on diversity and plurality, inspired by the seven universal design principles. Again, the authors come from different research traditions: Thomas Bredgaard, professor and head of the Research Centre for Disability and Employment, has a social science background in labour market research, while Kristian Moltke Martiny has a background in philosophy and anthropology and holds a PhD in philosophy and neuroscience.

Chapter 7, Asking the right questions: Guiding Universal design practices, based on interviews with landscape architects, formulates a series of questions that can be asked in the design process to pave the way for thinking about and creating universal design. This chapter is written by Marcus Tang Merit, sociologist, Marie Christoffersen Gramkow, PhD in landscape architecture, Ulrika K. Stigsdotter, professor of landscape architecture with a focus on health design, and Masashi Kajita, architect MAA, PhD and associate professor.

Chapter 8, Norm criticism and norm creativity as a starting point for a more inclusive view of humanity takes an exploratory approach towards pedagogical practices. It examines how the ambition of universal design can be integrated into practices within pedagogy and social work. The chapter is written across social science and humanities research traditions by Emil Falster, PhD and postdoc at Sociology and Social Work, AAU, and Leif H. Pedersen, PhD in Media and Media Development at RUC.

Chapter 9, Pedagogical tools for teaching universal design, introduces a teaching resource called the Universal Design Playbook, developed at DTU (Technical University of Denmark). This playbook can make questions about universal design tangible in design processes and co-design workshops. The authors are the developers from DTU, John Paulin Hansen, psychologist and professor at DTU Management, and Dagny Valgeirsdottir, assistant professor at DTU Skylab. Thomas Skovgaard, Head of Research for Active Living, Department of Sports Science and Biomechanics, SDU, contributes to the chapter with insights from the use of the tool in problem-oriented project programmes at SDU.

Chapter 10, Exploring the Person-Environment-Occupation Model, describes experiences of using the Person-Environment-Occupation Model as an analysis and design model in architectural practice. The authors of the chapter, Turid Borgstrand Øien, architect and assistant professor at BUILD, AAU, and Roberta Cassi, architect and PhD from the Royal Danish Academy, both come from an architectural research tradition, but in this context make use of a recognised tool and practical experience from the field of occupational therapy.

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2.0

Residential architecture as a prism for views of humanity

Inge Storgaard Bonfils and Anne Kathrine Frandsen

Introduction

At any given time, a building expresses the prevailing norms and understandings related to the activity or people it is intended to house. We are as citizens familiar with many public buildings, including schools, hospitals and municipal offices. Many have attended Danish primary schools and have become acquainted with the changing design of school buildings over time. From the large, high-ceilinged school buildings of the 1890s to the low-rise school with small courtyards for each class built in the 1970s or present-day schools with large standard rooms and many smaller rooms that can be used for group work. This change not only reflects changing architectural ideals, materials and building practices. School buildings also express the role or purpose of the school itself, how pupils are viewed and the prevailing pedagogical and didactic models (Jørgensen et al., 1980).

The same applies to the architecture of residential care facilities for persons with disability. It reflects the contemporary understanding of the social position of residential housing in social policy and of the residents and their rights and needs, from the 19th-century labelling of residents as *paupers* to the contemporary perspective on residents as simply *citizens*. Thus, residential architecture can be considered a prism for changing views of humanity, deciphered via the buildings of different times: Does the architecture of the observed buildings signal expectations for care and treatment? For development, independence and normality?

Institutions and group homes for people with disability do not involve public space in the same way as do school buildings. The former are built to house and act as homes for a limited group of people in society. Who these people are will change over time. However, a historical perspective shows us that people with intellectual disabilities or other forms of cognitive impairments, some of whom also have concurrent physical impairments, have lived and often still live in institutions or group homes throughout their adult life. This chapter thus takes a comparative look at the types of institutions and residential facilities that have been built in the past and are currently being built for this group of citizens.

The chapter is based on the thesis that society's view of humanity is expressed in the care practices that prevail at any given time, as well as in the demands placed on the architecture that provides a setting for these practices. Based on this thesis, the chapter builds on an interdisciplinary perspective, drawing on knowledge from social science and humanities research on institutions and residential facilities for people with disability, as well as an architectural historical and professional perspective, looking at four key aspects: the location of the buildings, the design of the surroundings and the layout and scale of the buildings. In this context, institutional and residential architecture is viewed in connection with broader historical architectural trends in public buildings. Public buildings are thus used as exemplary cases reflecting changes in state-citizen relations.

This chapter draws mainly on existing literature. In addition, we have chosen to illustrate the description with observations and pictures from Ebberødgård in Birkerød, now known as Svaneparken. Ebberødgård has been chosen because it is an illustrative case study of the general shifts seen in institutional and residential accommodation buildings for people with disability in Denmark over time. Anne Kathrine Frandsen has provided observations and photos. In conclusion, we discuss how such an interdisciplinary perspective can contribute to and challenge previously dominant views of human nature and residential accommodation architecture, as called for by both the Convention on the Rights of Persons with Disabilities and the design vision for universal design. Can we view today's newly built residential architecture as expressions of universal design and a response to the call of the Convention on the Rights of Persons with Disabilities for equal rights?

2.1 State power, view of humanity and institutional architecture

Public buildings allow the state to appear in public space and are, thus, physical manifestations of power. According to Foucault, pow-

er can be seen as coercive and punitive as well as productive and supportive, meaning that power is expressed in technologies and techniques that mediate and facilitate particular understandings of human identities (Sandmo, 1999). In a building context, we might say that the primary school building shapes the identity of the *school pupil*, the hospital shapes the identity of the *patient*, and institutional and residential care facility buildings shape the people who live there and *their* identity in a particular way. Thus, through this approach, we link views of humanity with buildings or, in other words, we investigate the productive power of buildings in shaping particular identities.

In the Danish dictionary Den Store Danske, the term *view of humanity* (menneskesyn) is described as “*the view of humanity’s nature and place in nature and society*”.² In this chapter, we are concerned with the view of humanity as an expression of a social and contextual phenomenon (Appel Nissen et al., 2018) in the intersection between, on the one hand, how social policy views people with disability and, on the other, the reality of institutions and residential facilities that some people with disability live and have lived in. This implies an analytical approach that looks at the interplay between the *social policy framework and its view of people with disability* and the *material setting*, as expressed in the architecture of the buildings.

Institutions and group homes for people with disability have been the subject of much research from historical, socio-political and pedagogical perspectives. Professor Emeritus Birgit Kirkebæk has authored several publications on what was termed *Åndssvageforsorgen* (the public authority in charge of “the care for the mentally retarded”), covering the period from the first institutional buildings in the 1880s to the beginning of deinstitutionalisation in the 1980s. Kirkebæk has described the conditions at institutions on Livø 1911–1961, Sprogø 1923–1961 and at Karens Minde 1880–1987 (Kirkebæk, 1997, 2004, 2007). Kirkebæk’s research is based on archival studies focusing on the construction of the understandings

2 <https://denstoredanske.lex.dk/menneskesyn>

underlying the creation of these institutions and the treatment of people with disability within them. In this context, she also touches upon the institutional buildings themselves, including their physical layout, thus considering the underlying conceptions of adequate treatment of the residents. In these sources, the view of humanity is presented in light of the societal ideas and socio-political and pedagogical norms, values and practices that have been or are currently linked to efforts for people with disability living in institutions or today's group homes.

If we approach the phenomenon via architectural literature, we find very few descriptions of institutional buildings for people with disability (Dahlkild, 2015). One example is Ejlers, who in 1994 compiled an overview of Åndssvageforsorgen institution buildings in his work: *Fra anstalt til bofællesskab. Åndssvageforsorgens bygningshistorie 1855–1990. En skitse: (From institution to group homes. A history of care facilities for the mentally retarded, 1855–1990. A sketch)* (Ejlers, 1994). This book examines the buildings of the mental health care system through descriptions from the architect(s) behind the construction, the buildings' location, layout and function. The text is illustrated by drawings of the buildings and floor plans, and, in some cases, there are illustrations of, for example, toilet facilities and dormitories. Ejlers discusses the conditions that residents of the large institutions encountered and argues that *“the intention is to show that the architecture here can be a kind of mirror image of the view of humanity and the socio-political attitudes prevalent at the time.”* (Ejlers, 1994, p. 7).

In this chapter, we have chosen to organise the analysis from a historical perspective and a relatively general typology and periodisation in two main sections: *The era of institutions* (the 1800s to 1970s) and *Institutions towards more individualised lives* (1960s and 1970s onwards).

2.2 The era of institutions (1800s to 1970s)

Historically, Denmark has held a unique position in constructing large institutions able to house up to 1,600 residents. The first institutional buildings can be traced back to the middle of the 17th century with the construction of St. Hans Hospital, known as *Sankt Hans Hospital for the Insane and Deranged*.³ During the 17th and 18th centuries, the hospital was home to a mixed group of people who were unable to manage independently, also referred to as paupers. This could include people with physical impairments, blindness, intellectual disabilities, dementia and chronic and mental health problems (Kragh et al., 2015). In the book *På kanten af Velfærdsstaten – Anbragte og indlagte i dansk socialforsorg 1933–1980*, (Kragh et al., 2015) the authors describe how the idea of institutions for specific groups of people with disability took hold during the 19th century. This is apparent through the construction of specialised institutions for education and training; for people who were deaf (The Royal Institute for the Deaf and Dumb in 1807); for people who were blind (The Royal Institute for the Blind in 1858) and for people with physical impairments (The Society for the Crippled and Maimed in 1858). All institutions were located within the Copenhagen area. Kolonien Filadelfia in Dianalund opened in 1897 for people with epilepsy and people with mental disorders. In 1855, the first asylum for the mentally retarded (‘åndssvageanstalt’) was inaugurated: Gammel Bakkehus in Frederiksberg (Kragh et al., 2015, p. 24). The construction of a specialised asylum for people with intellectual disabilities marks a historical dividing line, separating people with intellectual disabilities as a group. Previously they had either been placed in institutions for the *unfit for work*, such as forced labour institutions, in poorhouses or in private homes. In the following years, 12 main institutions for people with intellectual disabilities were established

3 <https://www.psykiatri-regionh.dk/NRSH/fremtidens-retspsykiatri/fremtidens-sct-hans/Sider/Om-Sct.-Hans-hospital-i-Roskilde.aspx>

and remained until the 1960s, after which a gradual de-institutionalisation began. The size of these institutions varied, with the largest institution in Brejning near Vejle with room for over 1,600 in 1945. Large psychiatric hospitals were also established, such as Augustenborg on Als, which could accommodate 400 inpatients in 1932 (Kragh et al., 2015, p. 30).

Ebberødgård – the first institutional buildings

Ebberødgård is an institution built in 1892, initially as a branch of the Gammel Bakkehus institution, accommodating around 400 *alumni* (Ejlers, 1994).

Ejlers describes the story as follows:

"Ebberødgaard started as a labour institution for able-bodied alumni and was quickly supplemented with three asylum wards. Asylum wards was a term that existed in health services for the care of the mentally retarded until the late 1940s. The names of the houses were changed to pavilions, which were divided into lettered wards; the alumni became patients and divided into numerous medical groups. The patients were later renamed clients and residents, and the mentally retarded were renamed mentally disabled, and finally today we speak of them as intellectually disabled or, preferably, with no term at all." (Ejlers, 1994, p.8)

Ebberødgård, today called Svaneparken, is located on the grounds of an old manor house of the same name, right on the edge of Rude Forest in open countryside stretching down to Sjælsø Lake, just outside Birkerød in North Zealand. The oldest buildings, from 1892, consist of a complex of a 3-storey main building and four 2-storey pavilion buildings, set in a hilly park landscape with large old trees and a small



Image 2.1: Main building, Ebberødgård

lake. The buildings are arranged symmetrically around a courtyard that forms a forecourt to the entrances of the main building, with a clear hierarchy between the main building and the pavilions.

Its location outside the urban centre is typical of the healthcare buildings of the time. Light and air were considered essential for hygiene and healing. Therefore, hospitals such as the Municipal Hospital in Copenhagen, Bispebjerg Hospital, Copenhagen University Hospital and other healthcare-related buildings were placed outside the city centre, preferably in nature (Dirckinck-Holmfeld et al., 2007). In terms of institutions for the people with intellectual disabilities, the isolated location was also considered to be a safeguard for both the alumni and the surrounding community. The scale of the outdoor spaces around the buildings from the 1890s ranges from smaller spaces between buildings to the park's variation across large open spaces and smaller garden areas with groups of large trees, large shrubs and an avenue leading into the woods. These elements can also be found in the public parks and gardens of the time and were established at many of the institutions, as well, as nature was seen as

a healing and beneficent force. Harald Selmer, a pioneer of psychiatry in Denmark and chief physician at *Jydske Asyl* (later Psychiatric Hospital Risskov, now closed), wrote about this in 1846:

***"A beautiful area must be regarded as a particularly favourable circumstance for an institution for the insane. There will always be a large proportion of patients who can appreciate the beauties of nature. For these, the influence of an agreeable location and diversified landscape is most beneficial."* (Selmer, 1846)**



Image 2.2: One of the pavilions in the oldest part of the complex

The division of the institution into smaller pavilions also reflects the hospital architecture of the time, where the separation of medical groups into different buildings was a tool to reduce the spread of infection and ensure hygienic conditions. As well as separating different medical categories of psychiatric patients, the pavilions at Ebberødgård allowed men, women and children to live separately. The architectural similarity with the hospitals of the time thus testifies to a parallelism in the understanding and treatment of the people placed there: the medical profession and the medical paradigm's understanding of people as *patients* to be treated and cared for, and the idea that institutionalised life, cut off from the surrounding society, was the responsible societal solution to *the deviant and abnormal* (Rønn, 2001).

In line with contemporary historicist architecture (Millech & Fisker, 1951), the buildings are in red brick with ornamentation in yellow brickwork and do not reveal the building's function as an institution with dormitories, dining halls, etc. The complex could have accommodated a high school, a hospital or an agricultural school. When viewed from the outside, the individual buildings could have housed a school, a small train station or other public functions. This is simply what state buildings looked like at the time. Although the buildings, especially the pavilions, do not appear large, the scale of the building elements, such as windows, doors and the height of the rooms, indicate that they house a governmental function. In this case, a function that focuses on the treatment of those who inhabit the buildings and certainly not on privacy, intimacy and homeliness. This parallelism in the architecture of state buildings also testifies to how the state signals a visible position of power in the landscape.

In 1920, Ebberødgård was expanded (J. Magdahl Nielsen, 1862–1941) with several very large buildings that housed several new wards over three storeys. The scale of these new buildings was increased compared to the earlier buildings, not least because of the heavy brick facades without division or ornamentation, and without openings to the landscape spaces surrounding them. This expresses the authority and solemnness of a customs office or a public archive. Inside, huge dormitories left no room for individual consideration



Image 2.3: The park at Ebberødgård

or privacy. Here, patients were often subjected to lifelong treatment. The expansion is testimony to the pressure that developed over the period to place people categorised as *deviant* or *retarded*. More places were needed, and, during this period, the treatment approach was to segregate these people from the rest of the population based on the theory of heredity (eugenics). The *mentally retarded* and other *deviant individuals* were to be placed away from society believing



Image 2.4: Ebberødgård, extensions from the 1920s by Magdahl

that they posed a risk of spreading harmful genetic material (Kragh et al., 2015).

Despite this dominant societal view and policy aimed at this population group, critical voices denounced the conditions in the large institutions. The conditions at Ebberødgård were used as an example of very harsh treatment of people with intellectual disabilities. They were examined by the Ministry of Justice, but this did not lead to any action or change (Kragh et al., 2015).

2.3 Institutions moving towards more individualised lives (the 1960s and 1970s onwards)

In terms of social policy, the view of people with disability changed from the 1950s onwards, with an emphasis on normalisation and integration. Doctors' position and power were challenged by, among others, parents' associations and pedagogical professional groups in cooperation with politicians and senior civil servants (Kirkebæk, 2001). Kirkebæk describes the political development as a change in the discourse from protection to rights. While the protection discourse was about, on the one hand, protecting society from the social disadvantage that people with intellectual disabilities were seen to represent and, on the other hand, protecting them from ending up on the lowest rung of society, the rights discourse concerned the universalisation of rights (Kirkebæk, 2001, p. 17). From this perspective, legislation on institutions shifts from a discourse of treatment and protection covered by special legislation towards including people with disability and their rights in mainstream legislation and considering the institution as housing that should meet general, substantive criteria. Up to 1980, the state ran the large institutions, which were then decentralised to counties and municipalities (Bengtsson & Kilskou Kristensen, 2006). In terms of legislation, the institutions were covered by the Social Assistance Act (Bistandsloven) 1976, section 112: Institutions for adults with severe physical or mental disabilities who have special needs for care, treatment, etc.

In terms of architecture, the same period saw the emergence of new perspectives on the architect and the role of architecture in society. From the 1930s onwards, functionalism emphasised the influence of architecture in a democratic society and the importance of considering in the design process the activities involved in the function that the building was intended to provide, a view that applied to everything from housing to public institutions (Lund, 1991). People and the function of the building became essential. The ceiling height was reduced, and buildings were not meant to express authority but to reflect and be shaped according to the function or activity for

which they provided a setting. Thus, as the perception of people with disability changed, so did institutional architecture. The scale of the buildings became smaller, and dormitories were replaced by bedrooms for 2 to 3 residents. The buildings represented a framework for a more individual lifestyle and a universalised understanding of the importance of housing in terms of the individual's well-being and quality of life.

Ebberødgård – the institution as a group home

This change can also be seen in the newer buildings at Ebberødgård, most clearly in a new children's ward from the late 1960s. The section consists of 9 atrium-houses. The buildings are single-storey, and you can almost reach the roof when standing outside. Each house is a unit with around 12 to 13 residents, with 2-person or 3-person rooms for the children, a common room, a kitchen and a patio. The courtyard is shielded from view, but the many windows of the houses and the courtyard look out to the forest and surrounding nature. The houses are close to each other with paths between them. These buildings look like terraced or detached houses on a residential street from the same period. From the outside, it is not apparent that this is an institution and that the public authorities are responsible for it. The location alone, away from the large institutional buildings from the 1890s and 1920s, closer to Birkerød's residential area out by Sjælsø, seems to illustrate a normalisation, a desire to dissolve the institution and move towards a form of housing aimed at more individualised lives in line with the growing middle class in their detached homes. These are homes for residents, not patients, to be treated and cured.

From institution to residential accommodation

Since 1998, when the Social Services Act replaced the former Social Assistance Act, the concept of the institution has been replaced by the concept of residential accommodation in the legal sense. The Social Services Act emphasises that services must be provided based on an individual assessment and in cooperation with the resident in question – regardless of functional impairment. The assistance must



Image 2.5: Ebberødgård, new ward from the 1960s

be provided based on individual decisions, and not as an integrated residential accommodation and services programme. According to the Social Services Act, all people with disability are residents in their own homes, regardless of their place of residence, which indicates that the individual is placed at the centre and must have influence over their own life.⁴ In a legislative context, permanent residential accommodation is a dwelling *”for people with significant and perma-*

4 <https://socialstyrelsen.dk/handicap/udviklingshaemning/om-udviklingshaemning/et-historisk-blik>

ment functional impairments who need extensive help with ordinary, daily functions or care or treatment, and who cannot meet these needs in any other way” (Social Services Act/ServiceLOVEN, section 108).

The period that followed the abolition of the institution concept in 1998 saw ongoing discussions and criticism of developments in the field. With the 2007 Municipal Reform, the municipalities took over most of the former county residential accommodation for people with disability and have since modernised and built new group homes. Criticism has centred on the fact that some of the old institutional buildings were outdated, with residents still sharing toilets, for example. Renovation and new construction were required to enable people in group homes to achieve the same standard of living as the rest of the population in terms of housing (Langager et al., 2009). Criticism has also been directed at the fact that newly built group homes was built with institution-like architecture. Critics have referred to the ideals and rights for independent living as stated in the UN Convention on the Rights of Persons with Disabilities (UN-CRPD). In 2009, Denmark ratified the UNCRPD, thereby assuming the obligation to organise legislation and administrative practice accordingly. Article 19 of the convention concerns the right to an independent life, focusing on people with disabilities and their rights about residence and support. Article 19(A) states that: *“Persons with disabilities have the opportunity to choose their place of residence and where and with whom they live on an equal basis with others and are not obliged to live in a particular living arrangement”* (UNCRPD, 2008). The UN monitors national compliance with the provisions of the convention through the UN Committee on the Rights of Persons with Disabilities. In 2014, the UN raised concerns about Denmark’s compliance with Article 19, highlighting criticism of the municipalities’ construction of new, institution-like group homes for people with disabilities, that these are often located outside city centres, and that people with disabilities have limited choice about where they can live and with whom (United Nations, 2014).

In 2021, the Danish Institute for Human Rights published the report *Boligvalg og retten til et selvstændigt liv for mennesker med handicap* (*Residential choice and the right to an independent life for*

people with disabilities) (Wamsler et al., 2021), which, among other things, recommended phasing out long-term residential accommodation (cf. section 108 of the Danish Social Services Act) and instead designating and building housing for people with disabilities according to the rules of the (social) housing legislation.

Ebberødgård – residential accommodation as an apartment complex

This development has also left its mark on Ebberødgård. Svaneparken, as Ebberødgård has been called since the 1980s, was transformed and renovated around 2000, when large institutions began to be abolished. Many of the old institution's large buildings were sold and converted into private owner-occupied flats or used for other public bodies. The remaining buildings were divided into smaller group homes and daycare centres.

Most recently, in 2018, a new group home centre with 44 residences was built for people with severe physical and cognitive disabilities. So far, the development consists of three two-storey buildings, each with three wings sheltering an inner courtyard. Each resident has a flat with a living room, kitchenette, bedroom and bathroom. Each flat has a small balcony. The flats face out onto internal communal dining and living areas with access to the courtyard space, which is shared by all the residences across the three wings. Residents can choose to stay in their flats or meet to participate in shared activities in the communal areas.

From the outside, the building looks like a block of flats. It shows no visible signs of being a residential accommodation facility for a specific group of people, and the dwellings are rented as individual dwellings under the Social Housing Act (*Almenboligloven*). The scenic and somewhat isolated location, which might previously have indicated an institution, is common to both the residential accommodation and the area's private owner-occupied homes, thus negating the distinction.



Image 2.6: Residential accommodation from 2018 on the site of the old Ebberødgård, now Svaneparken

2.4 Discussion and conclusion

State power is both visible and invisible. Whereas the first institutional buildings appeared as behemoths of power, indicating the authority of the state over the people who lived there, the power of the state has today been rendered invisible about buildings. We can no longer distinguish between housing for people with and without disability, which expresses equal treatment of people with disability in terms of housing. Housing for people with disability are perceived as homes and should meet commonly expected space and design standards. Nevertheless, it can be questioned whether the invisibility of the *state* in the buildings and the mimicry of other dwellings

can ensure equal treatment. Ensuring that housing for people with disability is perceived as homes and meet universal standards is, of course, a good and necessary step, but it is still important to consider what it takes to establish equal treatment for a group of citizens who need the help of others, and what role housing plays in this. Is there a risk that the seemingly similar housing conditions for persons with disability may obscure more subtle inequalities in living conditions and life opportunities?

This anthology raises questions of how we can think about and realise universal design. How can a universal design perspective contribute to a discussion on residential accommodation and human rights? Universal design focuses on the individual's ability to choose based on preferences. The question then arises whether people with disability, in fact, have the opportunity to choose where and how they want to live. Are there options – can you choose between locations in nature or the city? Can you choose the degree of community in which you are to be enrolled as a resident? Without looking at the practices surrounding the building – for example, how citizens with a disability are allocated housing, and their say in that process – it is impossible to assess the building's contribution to equal treatment and equality.

From a universal design perspective, buildings and our physical environment are seen as more than just practical and utilitarian functions. Buildings are part of our environment. They affect us and can support our well-being, stimulate us sensually and physically, and thus have a decisive impact on whether we are inspired and perhaps encouraged to be active. Again, the decisive factor is whether such potential sensory or well-being-related qualities are utilised and whether there is room for accommodating individual preferences for well-being. Alternatively, whether there is time to support the resident in such independent activities as the building design may encourage. Thus, a universal design perspective can draw attention to the fact that equality is not only a product of the built environment itself but resides in the interplay between views of humanity, social policy and architecture, thereby emphasising that making power invisible will not in itself necessarily lead to a change in power relations or ensure equality.

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3.0

Product design – from ableism towards more inclusive design

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Our lives are full of products such as kitchen utensils, bathroom items, tools, furniture, and information and communication technologies that affect our various everyday activities. The development and design of everyday products has primarily been based on an implicit understanding of what constitutes an average body and an average bodily function. This chapter shows how recent design approaches take people with impairments and their needs into account to a greater extent and involve them as co-designers and co-producers.

The chapter combines sociologically oriented disability research and design theory, focusing on the design of and human interaction with material objects. The authors have contributed knowledge from different research horizons to provide insights for the development of an interdisciplinary research field on Universal Design, represented in this anthology. The chapter begins with a historical and theoretical look at the perceptions of the human body and its functions that underlie the design of many products that surround us in our daily lives. Based on the critical disability research concept of *ableism*, the paper discusses how these perceptions impact the everyday lives of people with an impairment. Against this background, competing design concepts and agendas are introduced, and paradoxes and controversies between them are discussed.

3.1 The average person as an ideal in design processes

The development and design of everyday products, such as kitchen utensils and furniture, have largely been based on an implicit understanding of what constitutes normal body size and function (Holmes, 2018). The underlying understanding of normality can be linked to several currents depending on the research perspective. In architecture, the notion of the normal human being can be traced back to Roman architecture, represented by the engineer-architect Vitruvius, later reproduced in the famous drawing by Leonardo da Vinci *The Vitruvian Man*. Sociological disability research describes

how notions of the average person have been expressed in the phenomenon of *the average person* (Grue, 2016). A notion that can be traced back to A. Quetelet (1796–1874), a Belgian astrologer, statistician and mathematician who applied mathematical-statistical ideas of averaging to measure the human body (Grue, 2016; Holmes, 2018).

The idea of the average person is reflected in biomedical science, where disease is perceived as a deviation from the norm. Similarly, reduced functional capacity is defined as a deviation from normal physical, sensory or cognitive functioning. The biomedical model of disease primarily conceptualises diseases and impairment as biological malfunctions or deviations. In other words, being sick or disabled means your organism is not functioning optimally for some reason or other (Council of Ethics, 2016).

In order to understand the social and moral implications of this thinking, it is necessary to look at the notion of the average person from a sociological perspective, placing notions of normality in a historical, cultural and societal context. The concepts of normal, normality and norm can express a conceptual link between mathematical-statistical understandings of normality and norms for design. While the mathematical-statistical observation is neutral, its interpretation and use in a design process are culturally and socially conditioned. Arguably the best-known reference guide for designers and architects is *Humanscale* from design firm Henry Dreyfuss Associates. With different versions published between 1974 and 1981, *Humanscale* was based on the concept of a standardised body and exemplary movements, and still serves as a vital tool for architects (Kajita, 2019). Such tools can have consequences for the people who want to use certain products, as illustrated in the following example.

Shampoo bottle with tight opening mechanism

A woman with rheumatoid arthritis receives a luxury shampoo as a gift. The gift is given with the intention of pampering and nurturing a body with stiffness and pain. When it is time to use the shampoo, it turns out that the woman cannot open the bottle because of the design of the opening mechanism. There is a lid at the top and by pressing on one side, you open a spout on the other side. The mechanism is too tight. The woman tries to pour the shampoo into another container but gives up because the opening is too small and the pouring takes a long time. The woman throws out the luxury shampoo and buys the usual shampoo that she is familiar with and where the bottle has been designed with an opening mechanism that she can use without any problems.

3.2 Ableism in product design

In critical disability studies, the term ableism is used to refer to the social, cultural and political conditions that label disability and impairment as deviations, thus contributing to the marginalisation of people with reduced functional capacity. Campbell (2001) describes how *“ableism refers to a network of beliefs, processes and practices that produce a particular kind of self and body (the corporeal standard) that is projected as the perfect, species-typical and therefore essential and fully human. Disability then is cast as a diminished state of being human.”* (Campbell, 2001, p. 44, quoted from Bogart, 2019).

Ableism is a term that, like other ism terms such as *racism* and *sexism*, describes a view of humanity that involves a denigrating attitude and discrimination against specific population groups, often because of their race, gender or functional capacity. Ableism is thus a

sociological concept that has been used in studies of how people with impairments experience their encounter with a world and society not organised on their terms. Such an inside perspective provides insight into how people with impairments experience the use of different products in everyday life when products are designed based on a notion of normal body function. When using such products, people with physical disabilities experience difficulties and limitations in their daily lives, due to, for example, reduced muscle strength or coordination, as in the example above.

As a consequence, some products may not be possible to use at all, it may take longer to use products that other people use, and people with reduced bodily function may become fatigued more quickly or may experience pain when trying to use products designed for people with normal body function. Thomas (1999) describes this as a functional capacity effect that has psycho-emotional and social consequences. The person's activity level and range of activities may be reduced. The person may choose to withdraw from activities or social events involving everyday products that they have experienced as tiring or painful.

Other social consequences can be pointed out, as the use of such everyday products may make a person's deviations from normality more visible in, for example, public spaces. Others may stare, or the person may experience various forms of avoidance behaviour when interacting with others (Garland-Thomson, 2006). The person may seek to conform to normality in their bodily expressions to fit in (Goffman, 2009). It may also mean that some products are unusable, and the person, then, does not purchase or use them. At a normative level, these products signal that the person is wrong – as such an expression of ableism. It is a constant reminder of the body's deviation from normality, which contributes to a subtle and constant process of stigmatisation (Bogart, 2019; Goffman, 2009).

Ableism can thus be expressed in the beliefs, norms and expectations toward end-users that designers might implicitly base their work upon, which ultimately has defining influence on the final product. This being so, designers contribute to maintaining a form of structural discrimination (Imrie & Hall, 2001).

3.3 Hacking everyday products

The above description of ableism can be criticised for considering people with impairments as passive consumers of products. This overlooks that people with impairments, their relatives, networks and the professionals who might help them in their daily lives can be skilled problem solvers because they are used to dealing with situations that require creative solutions. In design research, this is described by the terms *hacks* and *hacking* (De Couvreur & Goossens, 2011). A hack should be understood as a simple modification or adjustment made with the materials at hand. De Couvreur and Goossens write:

"When visiting a rehabilitation centre, one cannot imagine how many objects have been repurposed or precisely tailored to a user's needs and desires. Patients or therapists do not use the universal products but take them as starting points to build their own personalised applications."

(De Couvreur and Goossens, 2011, p. 110).

The phenomenon of hacking everyday products thus shows how people act and react to products they find unusable in order to make them more functional. Examples of hacks are also seen in the homes of people who find it challenging to navigate through daily lives affected by the increasing technologisation and digitalisation of everyday products. The following examples illustrate this.

An older man with cognitive challenges has difficulty using his TV remote control. He presses the wrong buttons, opens various menus and can't find the channels he wants to watch. The solution is to cover irrelevant buttons with tape to reduce the number of functions and make the interaction more straightforward.



Image 3.1: Remote control with a reduced number of functions



Image 3.2: Washing machine with simple 'I-II-III instructions' for use.

An older woman obtains a new combined washer-dryer with many washing functions and an app solution. She finds it difficult to understand the many options and desires a simple guide to washing and drying non-white laundry. A simple solution is created by cutting black tape into smaller pieces and sticking it to the machine in an I-II-III guide to indicate the programme setting, start and drying function buttons.

Hacking a product implicitly indicates a criticism of the existing product, which has not been adequate in its original design since it needs to be modified. At the same time, hacks can be seen as a need for more customised products adaptable to a specific context or requirements (De Couvreur & Goosens, 2011). Investigating product hacks can therefore reveal opportunities for change for companies that want to develop inclusive designs.

3.4 Competing design concepts and agendas

Recently, critical voices and political agendas questioning designed products and how they are conceptualised have grown in numbers. This applies in politics, design research, education for designers and among practising designers. The design field is broad and includes the design of everything from physical products at many different scales (from toothbrushes to buildings and urban environments, for example) to intangible products such as services, systems and strategies. Within democratic societies based on free market forces, there is neither consensus nor uniformity regarding what should be designed and how. However, some organisations set standards for how products should be designed and how they should be used. In 2001,

ISO⁵ produced a guide to help those creating standards ensure that they included accessibility. Ten years later, the three major international standardisation organisations, ISO, IEC⁶ and ITU,⁷ made a joint statement to work together to make it easier to include accessibility in their standards. However, the standards are criticised for not defining what is meant by accessibility, leaving them very open to interpretation (Persson, 2014).

In the following, several competing design concepts and examples of their definitions are presented.

3.5 Design for all, universal design and inclusive design

Design for All is probably the most widely used design concept about designing for accessibility. The European Institute for Design and Disability⁸ (EIDD) defined Design for All as “*design for human diversity, social inclusion and equality*” (The EIDD Stockholm Declaration 2004 in Persson et al., 2015). The overarching agenda is that products are designed and produced for use by as many people as possible. At the same time, there is a realisation that it may not be possible to design solutions that will suit all potential users (Persson et al., 2015).

Universal Design, by comparison, is a design agenda that initially focused on accessibility in relation to the built environment and was formalised by Ron Mace through seven design principles (see e.g.

5 ISO: International Organisation for Standardisation.

6 IEC: International Electrotechnical Commission.

7 ITU: The United Nations specialised agency for information and communication technologies.

8 The international organisation, whose members are national organisations, companies and individuals from 16 different European nations, changed its name to Design for All Europe in 2006.

Mace et al., 1991; Mace, 1998). Today, the following definition is often cited: “*Universal design. The design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialized design*” (Story et al., 1998). There is a growing focus on universal design, not least in the fields of Human-Computer Interaction and architecture. Large organisations such as Microsoft and Google have design strategies and educational materials in this area (GoogleDesign, 2018; Microsoft, 2016). In architecture, Denmark and many other countries have a number of requirements for public buildings, including accessibility (Rumsans, 2020; Lid, 2021).

A third concept is *Inclusive Design*, the concept most widely used in the UK, where it is also enshrined in the British Standard on Managing Inclusive Design (Persson et al., 2015). Inclusive Design is described as a design movement that works from an agenda that all people are equal and should have equal opportunities regardless of age and ability. Like Universal Design, the agenda is value-driven and concerns the inclusion of as many people as possible in society, regardless of functional capacity – without compromising on good design (Luck, 2018 with reference to (Coleman et al., 2003) and (Morris, 2003)). The following is an example of a definition of inclusive design:

“The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialised design”

(BSI TBSI in Persson et al., 2015)

An Inclusive Design approach that is gaining ground in education and elsewhere is based on identifying underlying common motivations – across a variety of impairments – for using a certain solution. The identification of such shared benefits guides the design process. As illustrated in Figure 3.1, an impairment can be ‘permanent’, temporary or situational. The advice is to start by designing for per-

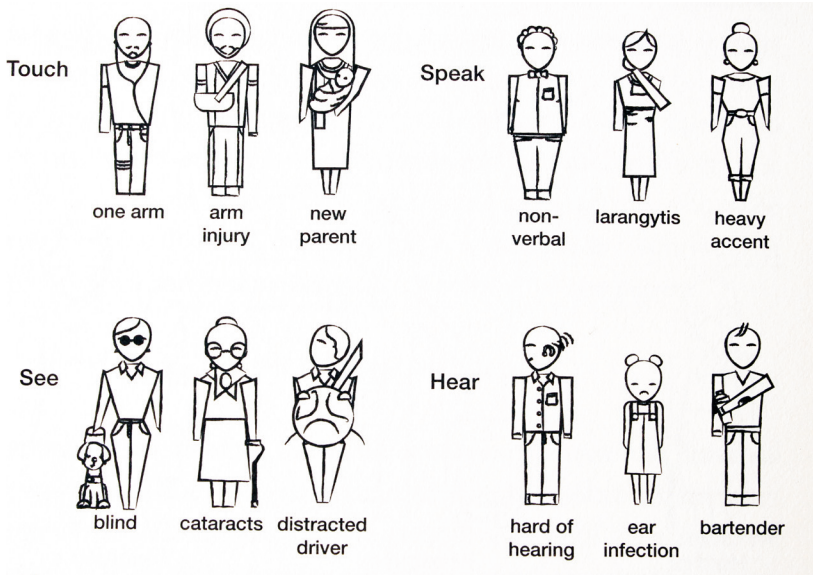


Figure 3.1: The persona spectrum (Holmes, 2018).

manent impairment, but the solution should be able to benefit many others as well (Holmes, 2018).

One example is closed captioning of TV programmes, which was established in the 1970s to enable deaf people to follow what was happening, but is now also a great benefit in situations where it is difficult to hear what is happening due to high levels of noise, or in situations where it is not possible to turn up the volume on the digital device out of consideration for others (Holmes, 2018). This eliminates the notion of a divide between people with and without impairments and recognises that everyone can have impairments in certain situations, either temporarily or permanently, and that functional capacity can change over a lifetime.

The design approaches Design for All, Universal Design and Inclusive Design are significant in that they each underline the intention of what is being designed, namely that the outcomes of the design processes should be inclusive, accessible and usable for as many people

as possible. In contrast, the names of the following design concepts refer more to their overall methodological approach to design.

3.6 Participatory design and co-design

The overall approach of designing in close collaboration with users and other stakeholders is often described as *Participatory Design* or *Co-design* and dates back to the 1960s. The focus is not specifically on designing for people with impairments, but on the inclusion of marginalised groups, democratic participation and mutual learning (Simonsen & Robertson (eds.), 2013). These approaches are particularly prevalent when developing material and performative techniques and tools for non-designers to participate in the design process (Brandt et al., 2013).

A slightly more recent approach is *User-Centered Design*, originally from the US and introduced by Donald Norman in his book *The Psychology of Everyday Things* (Norman, 1988). To support the designers work, Norman proposed seven design principles to ensure that what was being designed would be more intuitive.

The above descriptions do not constitute a comprehensive presentation of design approaches that focus on accessibility. However, accessibility-related terminology and inclusive design vary around the world, making it difficult to gain an overview. In the UK, the term Inclusive Design is most often used, while in Scandinavia, the most commonly used term is *Design for All*. In America and Japan, it is most often referred to as *Universal Design* (Luck, 2014). The design field is thus characterised by many competing design concepts and approaches, which can be explained by the fact that this field of research is relatively young (Persson, 2015).

3.7 Criticism of the universality of universal design

Universal design as a concept is rooted in ideals of universality, which have been criticised (see e.g. Pullin, 2009; Luck, 2014; Winance, 2014; Lid, 2020). Firstly, it has been emphasised that there is a significant challenge involved in the distinction between *individuals* on the one hand and *collectives* or groups on the other; between the universal traits we share as human beings (equality) and what makes us different (distinction) (Luck, 2018). People are different in terms of physical and/or mental function. Designing for people with impairments can therefore exclude others. In design terms, this challenge is often addressed by designing products with multimodal interfaces. That is, products that offer diverse visual, audible and tactile interaction options to cater for people with reduced tactile sensitivity, hearing and vision. A consequence of designing such products may be that they also become more complex to use in practice, which can be exclusionary for people with cognitive challenges (Pullin, 2009).

Another challenge is to move from general intentions to specific ones. The argument is that in practice, designers have to imagine and design something concrete (such as a product or an environment), whereby a material form emerges, and at the same time, the desire to design for diversity is reduced to a *minimal user* or a standard. In practice, two types of reduction take place. There is a reduction in the diversity of characteristics taken into account during the design process and a reduction in the attributes that the designer wants the designed product to have when it is brought to market (Winance, 2014).

In addition, it is emphasised that people are different, regardless of bodily function, which in relation to design means that they have different desires and dreams, preferences, opinions and requirements for products and for what is aesthetically beautiful, good design, etc. (Luck, 2014). This is partly culturally and socially determined but is also influenced by age, life stage, finances, etc. In addition, studies show that preferences and abilities are conditioned by the form on the day and the context in which possible actions take place (Winance, 2014). In essence, the controversy is about a gener-

alisation of what good design actually is. Ideals of universality downplay the fact that people with similar impairments may have different needs, desires, and requirements for products, etc., and that different impairments may conflict (Luck, 2018). It has also been highlighted that differences in body size and how our voices sound and are used are often overlooked, even though these vary considerably from person to person (Imrie & Luck, 2014). Furthermore, it is argued that no two people will have the same functional abilities over a lifetime (see e.g. Holmes, 2018; Lid, 2021).

The body size paradox is illustrated in the following example. During World War II, the cockpits of American fighter aircraft were designed based on the dimensions of an average pilot, which were obtained by measuring hundreds of different dimensions of thousands of American pilots. The assumption was that each pilot could easily reach out and grab the various instruments, but this proved to be wrong. The US Air Force experienced a higher rate of aircraft crashes that could not be explained by either mechanical or human error. A study of more than 4,000 American pilots found that none of their bodies met ten of the dimensions of the average pilot (Holmes, 2018).

In everyday life, the intentions behind the ideals of universal design are thus met by a reality characterised by diversity and variation in functional capacity, body size, interests, requirements and expectations for product design.

3.8 Customisation as a design principle

The above example (American fighter aircraft) led to a design principle of personalisation, which we recognise also from cars, where seatbelts, seats, rear-view mirrors and side mirrors can be individually adjusted as needed (Holmes, 2018). Car manufacturers are highlighted here in relation to designing and producing cars where it is easy to customise the car according to needs (Persson, 2015). We also recognise this kind of customisation from other products,

such as office chairs and pushchairs. However, for most everyday products (both physical and digital), there is a mismatch between product and user, which means that some of us experience *misfits* in some situations, thus negatively affecting our sense of belonging. The design thus affects our ability to access, participate in and contribute to the world (Holmes, 2018). In designing housing, education facilities and workplaces, the best solution in many situations may be a combination of universal design and customisation (Lid, 2021). In order to design for individual differences and preferences, the importance of focusing on and including the bodily experience directly in the design process is emphasised (Luck, 2014).

Creating the conditions for customised design can be achieved in many different ways. The following section presents three examples of initiatives from practice that illustrate how designing for individuals can be organised.

Remap is a UK-based organisation that aims to create customised solutions for and with people with impairments. The organisation consists of several local branches and facilitates meetings between its members (producers) and people who want help to solve a challenge (customers). The volunteer members have relevant qualifications and include engineers, designers and craftsmen. Their task is to make something (typically a physical product, a technological change, a modification) that can solve the challenge in close collaboration with the ‘customer’ (Luck, 2018). A large part of the process occurs at the customer’s home, as this is often the context in which the solution is to be implemented. The home provides an insight into the specific situation and can also be a source of inspiration, as its spaces and objects can be part of the solution. The customer participates as an expert, helping to develop ideas and evaluate prototypes made by the manufacturer. Remap has no intention of generalising or optimising the process or products, but rather to create solutions tailored to the needs and context of each customer. This design process is the basis for a TV programme called *The Big Life Fix*, which has gained publicity and attracted new members. Luck (2014) suggests expanding with more local branches to spread this kind of inclusive design practice.

The *Maker movement* is a growing global phenomenon. It consists of a diverse group of people, including DIY enthusiasts, designers and craftsmen, who all share an interest in creating physical and digital artefacts (Browder et al., 2019). They meet in *makerspaces* equipped with modern tools and production machinery to produce physical products and technological solutions. These workshops can be found in educational environments, libraries and public and private creative institutions. Makerspaces aim to support creative people in their work through creative physical environments and a mix of formal and informal learning (Culpepper & Gauntlett 2020). The rapid development of the maker movement is partly due to digitalisation, which allows ideas to be shared internationally with like-minded people through online forums, and allows others to replicate or participate in the further development of products (Browder et al., 2019). As workshop machines become cheaper and society is better educated in their use, they are likely to start entering private homes as well. These developments offer unprecedented opportunities to develop and produce high-quality, self-invented products and solutions when needed.

Fixperts are short user-centred learning programmes that give design students experience in developing designs that meet the needs of people with specific requirements. Developed by Daniel Charny and Dee Halligan, the model is used in designing education programmes worldwide. The programmes pair teams of students (Fixperts) with a person who has a particular challenge (Fix Partner). The particular challenge may be due to impairment but may also be due to other conditions. It is essential that the challenge is real, as is the desire to solve it. In a user-centred approach, the two parties develop a solution together. The Fix Partner defines the opportunity space; the students develop a prototype, the Fix Partner tests and evaluates it, the students adjust it, etc., until a satisfactory solution exists. An essential element is that the process is documented along the way. Each Fixperts team makes a short video that conveys the challenge, process and outcome. The videos are included in a catalogue of solutions and products on an online platform, so that the solutions can be replicated or inspire others (Micklethwaite et al., 2020).

A common feature of the practice examples is that, although the solutions are unique to the specific user, there is a focus on different forms of experience sharing. In addition, all solutions are developed in close co-operation with the people who will use the products. Users are involved throughout the design process, from defining the challenge to be solved based on everyday experiences, to exploring different possibilities through experimentation and developing the final design. In other words, they co-design using a bottom-up approach.

3.9 Concluding discussion

This anthology springs from a shared interest in universal design and the view of humanity that underlies thinking about – and realising – universal design. Universal design is based on the idea that it is possible to develop products, buildings, environments, technologies and services to be used by as many people as possible without the need for adaptation or special design. In this chapter, we have challenged this thinking, drawing on experiences in product design and design agendas that emphasise the unique and individual needs and desires of, for example, people with impairments.

Research into the factors that drive commercial design projects has shown that the design brief on which work is based often contains little information about the target audience in terms of demographics or social class. If there are no specific requirements in the design brief about inclusion in the design process or testing of the design for accessibility or ease of use, this is rarely something that the designers will initiate. A consequence of this may be that ableism in design processes is maintained structurally, as the phenomenon is not pointed out and is thus not part of the designers' awareness. The research also shows that using new design approaches depends on previous experience and, thus, what the designers have been taught during their studies. If, during their education, they have been trained to prioritise and design for diversity through participatory design processes, they are more likely to do so in practice (Zitkus et al., 2013).

Finally, we would like to highlight two possible tools to promote a greater focus on inclusive design. Firstly, we would like to point out that people with impairments are often overlooked as potential customers for a product, unless it is a specially designed assistive device for specific groups of people with impairments. This means that significant market potential is lost. Secondly, it is essential to recognise that ableism can be expressed subtly in how products are designed. It is therefore essential to raise awareness of this when training future designers. As part of this second tool, all design students should build up knowledge and experience during their training in staging and conducting collaborative design processes with people with impairments. We wish to emphasise the importance – and, in our view, the obligation – for design education to contribute to the design of more inclusive societies for all.

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4.0

Toward digital accessibility: Disability culture and social justice

**Barbara Nino Carreras, Jesper Bentil Holten,
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Despite the long history of design innovation driven by disabled people, disability activism, and non-discrimination policies⁹ (Blanck, 2014; Hamraie, 2017; Hamraie & Fritsch, 2019; Lifchez & Winslow, 1979) many countries in the European Union continue to neglect the right to digital accessibility for people with disabilities¹⁰ (Ferri & Favalli, 2018). When designers create digital technologies that neglect the lived experiences of disability or the existing approaches to designing accessible services or communication, social inequalities experienced by people with disabilities are reproduced (Shew, 2020). Therefore, as researchers, policymakers, governments, and technology developers across the globe increasingly implement digital infrastructures in education, the labour market, health care, and other public and private services, the relationship between social and digital inequalities needs to be carefully examined in the practice of design and “access-making” (Hamraie & Fritsch, 2019).

The history of disability activism in the United States and beyond, and its intersections with design shows us the various ways disabled people have hacked and reconfigured digital technologies and the built environment in creative and meaningful ways, in order to reclaim disabled people’s full and equal participation in society, and embrace the diversity of ways in which people move, communicate, and experience the world (Blanck, 2014; Fritsch et al., 2021; Hamraie, 2017). In doing so, these forms of transformative justice

9 Such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) and the American with Disabilities Act (ADA).

10 The term *disability* is contested and contingent on where, how, and who uses it. Persons with disabilities is a term used in anti-discrimination law, such as within the UNCRPD. Because representatives and advocates in Denmark use this term (in Danish, *mennesker med funktionsnedsættelse*), we alternate between different forms of identification in this chapter. However, we acknowledge that in disability literature, culture, and activism the term *disabled people* is used to reclaim disability culture and experiences across difference. Disabled people is the term used by disability rights movements in the US and UK to emphasise environmental, social, and political barriers and cross-movement solidarity. However, not all people with disabilities wish to use the term disabled and prefer people-first language. Therefore, we acknowledge the flexibility of language and different forms of identity formation.

have rejected medical models of disability and ableism¹¹ that wrongly consider certain bodies, minds, and ways of being as normal and worthy, while devaluing or marginalising others (Fritsch et al., 2021; Kafer, 2013). Subverting ableism in material and social relations, disabled people and allies have proposed alternative politics and epistemologies that center the expertise, creativity, knowledge, and lived experiences of people with disabilities (Hamraie & Fritsch, 2019). Notably, slogans such as *“Nothing about Us Without Us”*, first used by South African disability rights groups in the 1980s (Hubrig, 2020; Piepzna-Samarasinha, 2018) have reclaimed the involvement of disabled people as key stakeholders in policymaking, politics, knowledge production, and design.

Reflecting on the transformative power of intersectional disability activism that aims to subvert ableism and other forms of discrimination based on race, class, gender and other axes of social marginalisation, scholars in the United States have traced the development of design movements informed and led by civic movements such as Universal Design (Hamraie, 2017) or Design Justice (Costanza-Chock, 2020). Curb cuts—small ramps built into the curb of pavements—are one prominent example of a design intervention in urban space that stemmed from disability activism led by wheelchair users. Whilst the first examples can be traced back to the 1940s in Kalamazoo, Michigan, from a petition by Jack H. Fisher, a lawyer and disabled veteran, curb cuts gained traction during disability activism and civil disobedience of the 1960s and 1970s (Hamraie, 2017). As Hamraie reminds us, the history of curb cuts is rooted in the protests of disabled activists and allies who remade the material world to include wheelchair users in public space by smashing sidewalks with sledgehammers or pouring cement to create curb ramps (pp. 95–103).

Considering the ways in which access-making can be a site of *“political friction and contestation”* (Hamraie & Fritsch, 2019, p. 10) and prompt alternative forms of knowledge and practices led by dis-

11 Ableism can be understood as a form of social and material discrimination or a kind of prejudice against certain kinds of bodies, minds, and behaviours (Shew 2020; Fritsch et al., 2021).

ability cultures and communities, we provide examples in this chapter from advocacy work, speech therapy, and participatory qualitative research that can help designers and technology developers consider how digital access is contested and negotiated in situated, social, and material relations. Echoing crip technoscience scholars and disability justice activism (Hamraie & Fritsch, 2019; Mingus, 2010), our empirical examples, described in the following sections, argue for a political commitment to recognise the expertise and knowledge of disabled people in all phases of design projects, as well as the recognition of people's interdependence. The chapter, thus, calls for an understanding and practice of access beyond logistics or legal compliance, and for a collective social responsibility to make sure our world sustains diverse ways of being, communicating, and caring for one another (Mingus, 2010). To build these arguments, our chapter zooms in on Denmark, a state that has heavily invested in digitalising its public and private sectors, while neglecting disability access, often deemed as an afterthought by Danish disability rights representatives¹². Moving beyond issues of legal compliance to web accessibility guidelines¹³ we thus ask: how can researchers, policy-makers, designers, and technology developers pursue digital accessibility, guided by disability culture and justice, rather than solely committing to web accessibility as a burden with which to comply?

To explore this question, we are inspired by feminist philosophy and Donna Haraway's concept of situated knowledge (Haraway, 1988) that responds to objectivism in knowledge production and

12 For example, Diana Stentoft (2021), Vice President of the Danish Association of the Blind has written about the lack of accessible digital infrastructures: "Det er de digitale løsninger, der er inkompetente – ikke borgeren (It is the digital solutions that are incompetent – not the citizen)." *Ingeniørens PRO-medic DigiTech* (blog), March 30, 2021: <https://pro.ing.dk/digitech/holdning/det-er-de-digitale-loesninger-der-er-inkompetente-ikke-borgeren>.

13 In 2018, the web accessibility act was put into force in Denmark mandating the Agency for Digital Government to supervise compliance to Web Content Accessibility Guidelines (WCAG 2.1) by public organisations responsible for websites and mobile applications. In 2025, the European Accessibility Act will also have implications for private organisations that are to abide by web accessibility standards, although the specific tactics to enforce this law are yet to be determined at the time of writing this chapter (summer of 2022).

proposes a politics of locating, positioning, and situating knowledge (p. 589). This framework helps us unfold the importance of anchoring knowledge production in “particular lives, circumstances, and histories of practice” (Rosner, 2018, p. 49). Given that we, the chapter’s co-authors, come from very different fields of study and practice, we also draw on Inge Marie Lid’s (2014) work on Universal Design as an interdisciplinary practice that argues for the need of exchange and collaboration across different fields and epistemological positions. This chapter provides a methodological contribution to the study of digital accessibility via our collective writing process bridging theoretical and empirical knowledge from critical access studies, advocacy work, speech therapy, and media studies.

4.1 Bridging knowledge between different academic fields and advocacy through co-authorship

This writing project began when Bevica Fonden’s Universal Design Network invited PhD members, working on digital accessibility, to write a chapter for this anthology. Because digital accessibility is a matter of concern in both academia and industry, Barbara, a Colombian-Spanish PhD student part of the network, decided to ask Jesper to co-author this chapter. Jesper is a Danish disability advocate that collaborates with the Danish Agency for Digital Government as an Executive Member at the Danish Association of the Blind. As a blind person, Jesper has many years of experience using assistive technologies and working on web accessibility. He also supports blind people and persons with visual impairments in the use of assistive technologies, such as screen-readers and braille technology, to navigate the web or digital content. Barbara met Jesper during her ethnographic work at a digital inclusion network meeting, organised online by the Agency for Digital Government. At the event, Jesper was vocal and critical about the lack of inclusive design in the Agency’s development of a new digital public infrastructure called

MitID (a mandatory e-ID solution necessary to access public and private digital services in Denmark). Drawing upon his advocacy work at these meetings, Jesper unfolds in this chapter how the late inclusion of the Danish Association of the Blind in the design process of *MitID* led to inaccessibility and exclusionary design. Jesper describes the necessity to think about social and digital inclusion in all phases of any given design process, as well as the full, rather than partial, involvement of representatives of disability communities in digitalisation projects.

In addition to Jesper's involvement, Frederik, a Danish PhD student working as a speech therapist in a Danish hospital, also joined the project to discuss how digital design can be informed by the intersection of lived experiences of disability and specialised knowledge within speech therapy. Frederik outlines the importance of existing knowledge and strategies developed in collaboration with persons with cognitive and communication disabilities within speech therapy, as well as the importance of communication partners and practices of mutual recognition, such as respecting people's intellect, creativity, and agency regardless of how they communicate.

Leif, a Danish PhD student in media studies, contributes to the project with a third perspective on digital accessibility. Leif collaborates with a gamer who has visual and hand-motor impairments. He discusses digital accessibility centered on his interlocutor's identity as a gamer, for whom digital accessibility is a complex matter. Technical solutions and affordances that might make certain video games more accessible from a practical perspective can, in contrast, be the basis for social exclusion and disrespect. This insight, as well as the interlocutor's adaptive and resistive strategies, based on support by his gamer community, underscores the need to consider social justice problems—not only technical access issues—within design development.

These three divergent contexts of situated knowledge help us discuss the importance of disability culture and social justice across different disciplines and work practices within the Danish context and beyond. Our collective writing process began in Spring 2021, when we met to discuss examples of digital inaccessibility within the

Danish public and private sectors. During several meetings via Zoom over the course of a year, we identified the empirical examples described above, which are based on autobiographical accounts or generated through ethnographic methods (Hammersley & Atkinson, 2007). Writing together across academic disciplines and advocacy work prompted us to find a common language and format that could speak to both specialised and non-specialised audiences.

In what follows, we introduce three empirical examples narrated by Jesper, Frederik, and Leif. Each section was first written independently by each author and later edited by all of us through a series of writing workshops, both in person and remotely. The names of research participants are pseudonymised, and personal information identifying research interlocutors has been modified according to General Data Protection Regulation in Danish research.

4.2 Exploring digital accessibility through situated knowledges

The case of MitID: Incongruity between web Accessibility Legislation and the Lack of Inclusion in the design of a public digital infrastructure

Narrated by Jesper Bentil Holten

Since the Web Accessibility Act came into force on September 23, 2018, the Danish Agency for Digital Government has been responsible for supervising web accessibility compliance within their Digital Inclusion Division. This effort ensures that public authorities are familiar with legal requirements for web accessibility and have access to relevant information to comply with the Web Content

Accessibility Guidelines (WCAG)¹⁴—a requirement for the procurement of public Danish digital infrastructures since 2008¹⁵. In addition to web accessibility, the Digital Inclusion Division also works to establish dialogue with civil society organisations, public libraries, citizen service centers, and the financial sector. In this effort, the Digital Inclusion Division has been tasked with the responsibility for ensuring inclusive dialogue with civil society organisations and NGOs that represent disability rights, including the Danish Association of the Blind.

In the first months of 2020, the Digital Inclusion Division invited civil society organisations to discuss MitID (MyID, in English) a new mandatory digital infrastructure (or e-ID) necessary to access public and private digital services, such as applications for welfare benefits and online banking. The development of MitID was an opportunity for disability rights organisations to be involved in the design of a critical infrastructure made by the authorities in collaboration with a private company, and the financial sector. For disability rights representatives, it was paramount that inclusive and accessible design would be an integral part of the development process of MitID. However, even though web accessibility was specified in the public procurement and development of MitID as a digital solution, actual provisions for ensuring compliance with web accessibility guidelines were not sufficiently enforced.

Even though the Digital Inclusion Division, comprised of public servants hired at the Agency for Digital Government, facilitated comprehensive and meaningful dialogue via online meetings during the first lockdown in 2020, civil society representatives were not in-

14 The Web Content Accessibility Guidelines were made by the World Wide Web consortium in the 1990s. Since, these standards have gone through a series of iterations done by web accessibility professionals worldwide to create a framework that would enable developers to build web content accessible to people with disabilities, who use different assistive technologies and navigation strategies. Elizabeth Ellcessor has written about these standards and the community of professionals in her book *Restricted Access: Media, Disability and the Politics of Participation* (2016).

15 The Danish authorities agreed to use WCAG as a mandatory standard in 2008, the documentation is available on the following link: <https://digitaliser.dk/resource/3778883>.

volved directly in the design process of MitID; they were not included in testing its mobile application early on, nor asked to partake in design decisions of the digital infrastructure on desktop or mobile devices. Most of the conversations between civil society organisations and the Digital Inclusion Division were concentrated on disseminating communication about MitID. These meetings were helpful for civil society representatives to learn about the infrastructure and identify different accessibility needs of diverse citizen groups. Yet this approach was insufficient to influence the design of MitID.

Even though disability rights organisations, including the umbrella organisation Disabled People's Organisations Denmark and The Danish Association of the Blind, were invited to discuss which authentication instruments, such as a code display, should be used, representatives of Blind and partially-sighted persons were not involved in the core design of MitID's app and web components, nor where we involved in the practical process of migrating users from the former *NemID* (EasyID) infrastructure to MitID. The design and migration process were controlled by Nets, the company who won the tender to develop MitID for the state. Furthermore, even though I repeatedly voiced concerns about web accessibility and inclusive design, genuine monitoring and quality control of the product components were only conducted six weeks before the system launched in the Summer of 2021.

The inclusion of the Danish Association of the Blind occurred very late in the design process. Thus, when we were involved to test MitID, several usability flaws, as well as lack of compliance with WCAG became apparent. In addition, the lack of comprehensive information about MitID hampered the design of guidance materials and accessible training for the use of this new digital infrastructure, which the Danish Association of the Blind had to develop for their members at short notice. This process illustrates a lack of consideration for making digital solutions universal, inclusive, and accessible, as well as a lack of recognition of disabled people's knowledge and expertise of web accessibility and inclusive design. Had the development phase involved a more inclusive approach, MitID would be of higher quality today: truly accessible to the diversity within our society.

Civil society organisations representing people with disabilities could have informed MitID's design by testing it and providing feedback over the course of its development, rather than after it was developed. Involving members of disability communities in decisions relating to all the components of MitID would have enabled a truly inclusive process and provided insights to create alternative infrastructures for those citizens who are not able to use digital technologies, such as elderly citizens who have low digital skills, or individuals who rely on help to communicate with the authorities due to cognitive or communication disabilities.

4.3 A relational approach to accessible communication for persons with aphasia

Narrated by Frederik Gybel Jensen

Considering the way in which Jesper argues the importance of involving members of disability communities in the design of a public digital infrastructure, Frederik outlines the importance of inclusion in the design of meaningful communication for people with aphasia, a language disability. This case is crucial for the discussion of digital accessibility in Denmark, as authorities have made digital communication mandatory and thus, creating access for people with communication and cognitive disabilities is urgent. Through Frederik's account, he exemplifies how digital technologies can be meaningful for people with aphasia, however, he describes how contextual and personal factors influence accessible communication, and how people with aphasia, healthcare professionals and relatives, need to work together to communicate in meaningful and dignifying ways.

Aphasia and meaningful communication

Following brain damage from, for example, a stroke, people can experience a variety of disabilities depending on the location, type, and severity of the brain damage. A stroke can cause physical disabili-

ties like paralysis, or invisible disabilities like cognitive disabilities (Blanck, 2014). Stroke survivors can experience language and communication disabilities. Aphasia, a language disability, can impact a person's ability to speak and understand language, but also make it difficult for people to write and read. Aphasia can manifest in many ways. In the past, aphasia was primarily understood as a language disorder that impacts a person's functional language level. Rehabilitation was contingent on the level of language loss in relation to brain damage. However, this has changed over the years in Denmark. Today, speech therapists are increasingly aware of the need to understand and recognise the lived experiences of people with aphasia as key to inclusive rehabilitation.

In a digitalised society like Denmark, suddenly experiencing aphasia can have implications on the way people access public services. As more areas of healthcare are mediated through technology, it will become necessary to explore how people with communication and cognitive disabilities who rely on assistive communication, can enact personal autonomy, feel included, cared for, and respected. Sometimes people with aphasia communicate online with the help of a relative or an assistant. Assistive and augmentative communication (ACC) technologies, such as digital pictograms or software that aids spelling, can also assist people with aphasia in their everyday communication. As speech and language therapists, we increasingly explore and study ways to use digital technologies to aid communication between people with aphasia, their loved ones, and healthcare professionals.

Thanks to available studies on meaningful communication, speech therapists are increasingly committed to engage persons with aphasia actively in their rehabilitation process, and in their use, selection, and adoption of ACC (Kagan, 1998). However, digital technologies are not necessarily the optimal solution. There are other forms of communication, such as physical pictograms, that can be used in meaningful ways to aid people with communication or cognitive disabilities. When people with aphasia do not have access to specialised support and accessible communication, the affordances of a digitalised society can become a barrier. This could be the case

when people with aphasia interact with platforms needed to access health care that do not provide alternatives to text-heavy information (by offering, for example, digital or analogue pictograms, simplified language, or text-to-speech-functions).

For this reason, web accessibility, assistive technologies, as well as specialised support to access different communication aids around public digital services are imperative, especially when the interaction between patients and healthcare professionals is digitalised.

Accessible communicative situations as collective care and respect

Persons with aphasia that I have met through my research and practice often need support to communicate. They may need help to speak, understand, read, write information, and express themselves. Some people with aphasia need more help than others. When speaking to a doctor, or relaxing at home with their loved ones, people with aphasia can benefit from adapted communication and support from a communication partner or significant other. There are a range of developed methods that can help communication partners support people with aphasia. For example, Communication Partner Training (CPT) programmes can help relatives and others learn how to facilitate meaningful communication. Specialists in this domain use the analogy of a language-wheelchair-ramp to describe to relatives and healthcare professionals how to adapt their mindset to facilitate accessible communicative situations. Within speech therapy, we often encounter that conversation partners can hamper meaningful communication when they neglect to acknowledge individuals' intellect. To make explicit how social relations influence accessible communication, in the following section, I narrate an example from my own work experience:

Words on my white pages

After experiencing a stroke, Peter awakes in a hospital bed; he is a 61-year-old man from Denmark who works as a lawyer in a metropolitan area. The stroke has damaged his brain, leaving Peter unable to walk and talk as he used to. His right arm is paralyzed and when

he writes with his left hand the letters seem out of order. When Peter talks, he can say single words, and sometimes short sentences, but often those words and sentences do not make sense in the context of a conversation. When I enter the room, Peter is visibly frustrated while his wife speaks to him. Anne, Peter's wife, expresses frustration with her husband's difficulty in remembering their children's names. She is angry, distraught, and pressures her husband to try to name the things in the room: a bed, a TV, a mirror. Peter tries; he mutters words, but not the ones his wife expects. Peter suddenly closes his eyes, turns his head away from his wife, and remains silent. Following a short conversation with the couple I quickly realise that I need to find ways to support their communication and mutual recognition. Both for the sake of supporting Peter's confidence in his communicative abilities and intellect after the stroke, but also so that both Anne and Peter can understand Peter's communication needs. My impression is that Peter understands almost everything. But he finds it difficult to verbalise and write words. To help Peter, I follow Aura Kagan's (1998) Supported Conversation for Adults with Aphasia (SCA), a speech therapy method based on acknowledging a person's agency, intellect, and competences, whilst revealing them in conversation. First, I pull out a small white booklet with clear white pages, and a black sharpie I carry around. I slowly begin to write keywords as I speak, tracing my conversation with Peter, so that he can return to what I have said at any time. When I ask Peter a question, I provide a few written possibilities. For example, I write three different hospital names, and he points to the one we are in. In that way, I know he understands where we are. I also ask Peter how many children he has and provide different numbers on the white pages. He points to the correct number. At one point Peter agitates his hands, gesturing to me to turn back the pages, and points toward a keyword we used earlier in the conversation: the hospital's name. He seems to want to know more about why he is here. Pointing at words and numbers is Peter's current way to communicate and take control of the conversation. In addition, I can try to read Peter's emotions by paying attention to his facial expressions and body language. Supporting him requires me, and others, to continuously offer a space

for him to lead the conversation and create the right tools and communicative environment.

This specific example from my everyday practice as a speech therapist illustrates the complexity of supporting meaningful communication among persons with aphasia, as well as the asymmetrical power relation that requires careful balancing from communication partners and people in Peter's social circle. Zooming in on speech therapy for people with aphasia and its relation to environmental and social factors, we can reflect on the importance of understanding lived experiences of disability to provide accessible services and communication – both in person and in digital forms. People with aphasia need specialised support that reflects their individual needs and respects people's agency and intellect regardless of how they communicate. There is great potential in digitalisation when drawing upon available research within speech therapy, that centers the lived experiences of people with communication and cognitive disabilities. In this way, designing accessible communication does not need to be led by technological determinism but rather by a careful examination of the diversity of ways in which people communicate and rely on social and material relations to thrive and belong to the communities of which they are part.

4.4 Beyond technical access: Digital games and social recognition

Narrated by Leif Hemming Pedersen

After exploring the importance of social relations in fostering accessible communicative situations for people with aphasia from the perspective of Frederik, the following section investigates the social implications of design and use of digital technologies. This section shifts our attention from public services to private products, such as digital games. Our intention with this third perspective is to illustrate how private organisations also partake in the way people with disabilities enjoy digital technologies and shape their iden-

tities in a digitalised society. In what follows, Leif explores digital accessibility in online gaming via a think-aloud interview with a 29-year-old gamer referred to as David. This section highlights digital technologies as entangled in social relations, and the importance of examining social experiences of disability (Beeston, 2020) and their relation to identity formation and personal autonomy (Mackenzie, 2019).

David's player experiences

On top of David's shelf in his living room, four figures are on display: two of them portray the hooded assassins from the video game *Assassins' Creed*; the third figure is a half scale replica of the bionic underarm of the character Snake from the video game *Metal Gear Solid*; and beside Snake, David showcases a character called D.Va, dressed in her pink mesh suit, from the video game *Overwatch*.

Like the family pictures on David's wall right next to the shelf, these figures also say something about him. Clearly, he likes these figures and the fictional universes from which they come. But also, he likes these characters *because* they relate to something he enjoys doing: playing digital games on his computer and PlayStation. These figures exemplify that equal access to mainstream culture and activities are important for building and maintaining our identities (Beeston 2020). However, accessibility in gaming still requires improvement. For David, the issues of accessibility and gaming are interwoven with his disabilities and his social circle. Since birth, David has experienced hand-motor and visual disabilities, which he refers to as "*my things in my hands and eye*", without mentioning disability terms specifically. Due to his way of seeing and moving, he employs adaptive strategies to play his favorite games. While he adapts the games to his comfort and abilities, he also negotiates how to build social relations online.

For David, both the perils and pleasures of gaming revolve around his connections and experiences with other players. David is an early retiree who spends a lot of his time volunteering at a local sports organisation and visiting his mother several times a week. But it is in his online community, via the gaming platform Twitch,

that he builds and keeps contact with many of his friends. Like many gamers, socialising is one of the primary reasons for David to play (and watch) digital games. And at times, it is even his friends that help facilitate the game's accessibility for David. But social relations are not his only motivation to play. As David says, the two primary things that make digital games *more accessible* are his PlayStation controller and his friends.

David's preferred device for gaming is his PC, but he finds it much easier to use his PlayStation controller instead of his computer mouse and keyboard. The combination of his PC and PlayStation controller is therefore David's favorite setup. Especially when he is playing First-Person Shooter (FPS) and Multiplayer Online Battle Arenas (MOBAs) games. However, David also explains how not all games are designed for controller use. And, even if a game offers the option, the logistics of adapting the game to the controller can be cumbersome, especially when the design of the game has not prioritised the controller as the default device. Nevertheless, David has found adaptive strategies to play online games with friends. But such adaptations are not always well received among other players. As he explains, when games reveal the kind of device he is using, or if gamers notice he is playing with controllers due to specific character movements, it can lead to bullying. In David's own words: *"They get pissed off (...) Then you are called a fake gamer"*. In addition to hardware adaptations, other design features can also be a subject of controversy online. On David's Twitch channel, gamers can see that he often slows down the player or camera speed. When this kind of adaptive strategy is received with disrespect, it is David's gamer friends that enable him to experience digital accessibility:

[David]: "They back me up, support me and understand my problem. So, they don't get angry as such. I mean, they can get a little angry for fun: 'No! Shit, you didn't hit,' or 'it sucks that you hit like shit.' And then: 'Oh, you have your problem'. And then we talk a little and then we laugh, but

***it's kind of ... We laugh at the problems I have.
We use it as a joke."***

[Leif]: "Is it okay with you? Do they use a good tone?"

[David]: "Yes, some of them know exactly how far they can go. And there are some who have crossed my boundaries, and then we just talked about it."

While this conversation indicates that certain competitive gaming norms can take place safely and comfortably, David's account shows how the expectations of gamers who do not understand David become less of a barrier when he is supported by his friends. When David plays team-based online games, he makes sure that at least two or three of his friends are there to avoid others "*kicking him out*". This is often combined with turning off the voice-based chat function, blocking unfamiliar team members in the chat, and using an external chat function, such as Discord, as a safer space to discuss the game. In these situations, David's friends become a "*social buffer*" (Beeston 2020, p. 122) against hostility from other players.

David's experiences as a disabled gamer supported by his adaptive strategies and friendships underline how digital inaccessibility can be identity fracturing, whilst digital accessibility can be identity affirming. When designing accessible games, it is crucial to build relations and interactions based on the social recognition of difference. Game developers need to move beyond "*checklist style engineering approaches*" to accessibility (Power et al., 2018), which are certainly beneficial in developing design functionalities, but fail to grasp the ways in which disabled gamers might flourish online. Reflecting on the relationship between accessibility and identity in online games, thus, leads us to argue for disability knowledge and culture to influence game development. If the gaming industry embraces the lived experiences of disabled people more widely, we wonder, what kinds of fictional figures will stand on top of the shelves of the future generations?

4.5 Embracing disability culture and justice

In this chapter we have explored three different contexts that inform the study of digital accessibility: 1) the development of the Danish public digital infrastructure, MitID, and the implications of only partial involvement of disability rights advocates in its design; 2) accessible communication facilitated by speech therapy in healthcare for people with aphasia; and 3) accessible online gaming supported by adaptive strategies and social relations and recognition. These three empirical examples describe ways in which people with disabilities can partake in, or be excluded from, the digital age.

Through Jesper's account of the development of MitID, we describe how, despite the available knowledge on digital accessibility within advocacy work and disability culture, the involvement of disabled people in MitID's design process was partial. Meaningful involvement in design processes requires that technology developers and other important stakeholders recognise people with disabilities as key users, experts, and decision makers. As disability scholar Ashley Shew has argued, often the lived experiences of disability, disability culture, and activism informing design innovation are neglected in technology development projects (2020). As she writes:

“Tech designers’ reliance on their imagination of what it is to be disabled keeps the focus on individual functioning and limitation, rather than addressing the larger context – the poor infrastructure and social stigmas that work against the full participation of disabled people in society.” (p. 49).

In contrast, by embracing existing disability culture and history, technology development can center the lived experiences of disabled people as designers, makers, and knowers (Hamraie & Fritsch, 2019). However, as critical access scholar Aimi Hamraie reminds us, universal design projects are not neutral, but political (2017). Even

if we embrace existing disability culture and history in design processes, it is crucial to critically attend to the norms and politics that influence how and who is involved in or excluded from design or access-making projects¹⁶. In this regard, Frederik and Leif's examples show that people cannot be seen as isolated individuals but rather as interdependent social beings with situated lived experiences and diverse communication and access needs. Building on these examples, we echo disability justice activism that understands individuals as always embedded in social and material relations and reminds us that access is better understood as a collective, rather than individual, responsibility that encompasses intersecting identity group affiliations across race, class, gender, disability, income, and more (Hamraie, 2013; Mingus, 2010).

Considering a multiplicity of lived experiences and the practice of design as building social and material worlds (Costanza-Chock, 2020), acknowledging people's interdependence can be a generative principle to create worlds that sustain our differences. Drawing upon the work of feminist philosopher Catriona Mackenzie, we can thus argue that design projects should always acknowledge and work towards, what she calls, relational autonomy, which recognises that

16 Design Justice proponents argue for non-extractive design approaches where those involved in design processes have ownership, directly benefit from design projects, and are financially remunerated for their work (Costanza-Chock 2020).

“Our individual identities are constituted by interpersonal, familial and social relationships and intersecting social group memberships and through processes of enculturation into specific linguistic, political and historical communities”

(Mackenzie, 2019, p. 146).

Our analysis exemplifies how digital accessibility is not only a matter of technical access, but also a matter of social justice and social recognition, and that digital projects in the public and private sectors need a strengthened focus on collective forms of access (Mingus, 2010; Hamraie, 2013). Digital accessibility, just as other forms of access-making in the built environment, is not a static goal or checklist, but could be better conceived as a project of social justice that is constantly negotiated in socio-material relations. As technologies are entangled in many aspects of everyday life, such as education, welfare provision, the labour market, or cultural production and consumption, people with disabilities need to be involved as key stakeholders in digital design projects, so that existing social inequalities and discriminatory attitudes experienced by people with disabilities are not reproduced through digitalisation.

As a methodological contribution, we also offer a written collaboration that attempts to bridge advocacy work and research. Rather than solely interviewing accessibility consultants and disability rights representatives, scholars must engage in collective writing projects where valuable knowledge within advocacy work can engage in conversation with academic research, recognising that much of the flexibility that digital technologies provide today is in great part a result of disability activism and disabled people (Blanck, 2014). Thus, we hope this chapter will inspire technology developers and researchers to truly embrace disability cultures, histories, and expertise as outlined through this writing collaboration, and by many other scholars and activists cited in this chapter who are committed to collective access and disability justice.

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5.0

Dependency sensitivity via universal design

**Marcus Tang Merit, Emil Ballegaard,
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Dependency is universal to the human condition. Each of us rely on the social, cultural, and physical structures we are surrounded by in order to thrive and survive (Hendren, 2020, p. 127). How we are dependent, and to which degree, is however not universal but differs based on permanent, temporary, or situational conditions as our bodies, minds, and surroundings change over time (Holmes, 2018). Professionals working within the field of architecture and design constantly make decisions about how to shape, and how not to shape, spaces and objects. Intentionally or unintentionally, this influences how people can depend on their physical surroundings. In this chapter, we focus on this dependency, questioning which dependencies we should consider when designing. In doing so we also question who gets to define which dependencies are important and unimportant in our design processes.

For Universal Design, the intention is to make spaces and objects equally usable by as many people as possible (Lid, 2020). This makes the above questions important because they emphasise the ambitions of universal design to make our society more inclusive. At the same time, they open an avenue of potential critique of universal design. While universal design can make us aware of the potential discrimination in how we design our surroundings (Kajita, 2016), the concept does not help us overcome the normative and ethical dilemmas in making such decisions. In this chapter, we therefore seek to unfold the potential of universal design to be used as a descriptive and sensitising concept – one which provides an increased awareness of the multiple dependencies we are subjected to as human beings but does not claim a prescriptive power over what or how to design. This differs from initiatives such as the *Tours on Wheels* which take abled non-wheelchair users for a wheelchair trip (Jakobsen et al., 2020). Such trips provide an awareness of important physical barriers, enhancing a focus on the particular spatial dependency of manual wheelchair users. However, by temporarily experiencing different physical barriers practitioners cannot develop a sensitivity to the experience of a permanent wheelchair user for whom the dependency on a manual wheelchair is not temporary. Nor do such

tours provide a deep understanding of social and cultural dependencies, which manual wheelchair users might experience.

In qualitative sociological inquiries, sensitising concepts are those theories, ideas, and preconceptions which structure how you perceive a given situation and what you read out of the data or narratives presented to you (Bowen, 2006). The need for such sensitising concepts rests in the fact that qualitative data and real-world situations are too complicated to be described and understood in their entirety. If used knowingly, a sensitising concept helps focus the gaze by employing a particular lens through which the world is observed and analysed. As a sensitising concept, we argue that universal design is a descriptive concept that is unable to prescribe how to give form to environments and objects (see chapter 1). As such we argue that universal design should be utilised as a conceptual lens which sensitises us to the layers of dependencies embedded in specific contexts. However, this requires that we employ universal design as a pluralistic concept, one which opens space and spatial situations to multiple coexisting descriptions of the many dependencies a person experiences. In this way universal design can provide an alternative to how we perceive spatial situations.

To explain what we mean by this we need a specific example. This chapter will follow Peter, the user of a motorised wheelchair, on his daily commute. Through observing and commuting alongside Peter, and subsequently interviewing him about his commute, this chapter attempts to exemplify how universal design can sensitise us to the layers of dependency which Peter experiences. Peter's commute is not meant to be representative, but it serves as an example of what can be gained by applying universal design, as one of many possible approaches, when trying to make sense of spatial situations. Peter's commute is a social, cultural, and spatial phenomena (Heynen, 2013; Jensen, 2014). Social as it happens because of, and surrounded by, people and societal conventions of getting up and going to work. Cultural due to the expectations of, for instance, his fellow passengers about how to behave when boarding and travelling on a train following a tight rush-hour schedule. Spatial because it is shaped by the possibilities afforded by the architecture and design of the stations,

train carriages, and streetscapes he moves through on his way to and from work. Each of these aspects to Peter's commute entails a degree of dependency which intertwines in Peter's experiences of his usual train ride.

5.1 Universal design as a sensitising concept

Coined by the US architect and wheelchair user Ron Mace in the mid 1980's (Duncan 2007), universal design is based upon an ideological and democratic understanding of equitable rights for all citizens. As we are increasingly becoming aware of the implicit and explicit historical discrimination of various groups within the design disciplines, universal design can make us aware of how for example women and disabled people have previously been excluded from participating in society (Lid, 2021). In the US the universal design movements grew within various associations for persons with disabilities from the 1970's and onwards. These associations contested disability as an individual medical diagnosis, and the normalisation of the average *abled body* which came with it. Instead, they promoted a *social model* for understanding disability based on the (societal) barriers experienced by people with disabilities (Winance, 2014).

In tandem with this understanding, Mace and his colleagues argued that few are born with a disability; more often, disabilities are acquired over the span of a life and should therefore be considered "*a normal condition of life that should be taken into account in all that is designed*" (Mace et al., 1991, p. 6). In 1997 the Centre for Universal Design at North Carolina State University defined universal design as:

***"The design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialized design."* (Story et al., 1998)**

Moreover, seven universal design principles and several guidelines have been outlined too. In short, the principles are: 1) Equitable Use, 2) Flexibility in Use, 3) Simple and Intuitive in Use, 4) Perceptible Information, 5) Tolerance for Error, 6) Low Physical Effort, and 7) Size and Space for Approach and Use (ibid). As previously mentioned, an important limitation of universal design in its definition and principles, is its descriptive nature. In other words, universal design does not provide an answer for how to achieve, for instance, simple and intuitive use. Instead, we will argue that through its principles and goals¹⁷ universal design can sensitise us to how people depend on their surroundings.

It is also possible to criticise the universal ambition of universal design (see for example Winance 2014, Luck 2014, Lid 2020). Winance (2014) for one emphasises the challenge of moving from diversity to universality when conceptualising users, use, physical environments, and objects. Winance stresses that

“In the UD [universal design] approach, a double reduction is necessary [...] an initial reduction concerning the diversity of those characteristics taken into account in the design process; a final reduction concerning the diversity of the attributes that we want to bring out in the designed product.” (ibid., p. 1335)

In her critique, Winance refers to the idea that design is based on material and functional properties and will never be able to include all forms of diversity. Winance’s study adds important nuances to the challenges of (designing for) everyday living as peoples’ situational experiences vary. Here it is important to not reduce design tasks and processes to solely be about functionality as the social and

17 For further discussions on the principles and goals please see chapter 1 and 11 in this volume.

cultural context is as important as the physical for people's bodily perceptions (ibid., p. 1338). In other words, universal design can sensitise us to the multiple layers of dependencies which coexist when experiencing a spatial context.

5.2 A commute

This chapter draws on Peter's experience of commuting with a motorised wheelchair. As we followed along on this commute, we used GoPro cameras attached to the chest of Peter and one of the authors to record the entire trip from two perspectives. A few weeks after the trip we conducted a qualitative interview with Peter structured by an interview guide while showing various clips from the two videos. Peter often travels with his brother who is also hired as his personal assistant. During the interview and the commute Peter's brother was present. Specifically, we followed Peter as he leaves his home located in Nordhavn, a recent urban development area in Copenhagen, gets the train from the Nordhavn station less than a kilometre from his home, spends roughly 30 minutes on the train, and finally traverses the last 500 meters from the train station to his office. All quotes have been translated to English by the authors.

The street

As most of us can relate to, Peter has a morning routine when going to work. He mentions he can accurately predict whether he is in good or bad time for catching his usual train without looking at the clock. When everything works, his routine is marked by a smooth flow. Peter can often reach his workplace without paying any particular attention or concern to his surroundings. This makes Peter's commuting experience much the same as most other people, as the everyday mobility of for instance commuting is marked by its distinct lack of cognitive effort – that is, unless something happens which interferes with routines (Freudental-Pedersen, 2022). Indeed, in the quote below, which refers to the first part of Peters' commute from

his home to the station, it is not immediately distinguishable that Peter is commuting by wheelchair. Arguably, this exemplifies what an equitable commuting experience could look like.

“Of course, there are situations, when you drive behind someone that walks very slowly on a walking street like Strøget or other places in the city, and you think, I have to overtake them, it’s going too slow (...). Then, I find myself looking forward to a certain part of the street where I can smoothly overtake them. But on this trip to and from the station (...), I don’t think about that.”

I. 115-122



Image 5.1: Minute 04:09 close to Peters home in Nordhavn – Peter’s perspective



Image 5.2: Minute 09:28 – Peter's perspective

As we leave the newly developed area of Nordhavn behind and approach the older urban area surrounding the Nordhavn Station we find ourselves on a narrower sidewalk which also serves as bicycle parking for a different type of commuters. The day we documented the commute, there was space enough for both pedestrians and wheelchairs to pass by the parked bicycles and stay on the sidewalk (see image 5.2). According to Peter, this is not always the case. During our commute and during the interview, Peter mentioned how bicycles are often parked in such a way that they block the sidewalk so much that he cannot pass with his wheelchair. When this happens, Peter has to reverse his wheelchair to find a place where an asphalt slope allows him to descend from the curb of the sidewalk to the bike path. This means either driving the 100 or so meters to the station entrance on the bike path against oncoming traffic or crossing the street to make use of the opposite sidewalk.

In image 5, we can see that a child (she seems taller than she is due to the height at which the camera is mounted) is making use of

the same sidewalk as Peter. The difference is that while the child (or other people commuting on their feet) can easily sidestep an awkwardly parked bicycle and return to the sidewalk, Peter cannot manage the same maneuver due to the steep curb between the sidewalk and the bike path. A bicycle, while physically the same barrier, does not impact Peter and the child similarly, as Peter's commute and flow is halted much more abruptly. As an example, this is interesting because it emphasises how Peter's commute might differ from people walking. This should focus our attention to the spatial dependencies at play here. In this example both the child and Peter are dependent on a sidewalk to arrive safely and comfortably to their destination. However, in case of a bicycle parked out of place, the bodily ability of the child enables a quick return to the sidewalk, thereby reestablishing the commuting experience provided by the sidewalk almost immediately. This is not the case for Peter, who is forced to change plan and make a conscious decision to find an alternative path to the station. Simultaneously, cyclists depend on the area surrounding the station to provide a space for parking their bike. Therefore, this sidewalk is the site of multiple coexisting types of spatial dependencies; that of Peter, people walking, and the cyclists. By being sensitive to the existence of these multiple spatial dependencies we can describe how and when these dependencies clash, resulting in Peter's bad experiences of a blocked sidewalk.

The station

The stations play a major role in Peter's commute to and from work because it is where Peter most often experiences interruptions in his regular commute to work. In most of Copenhagen's train stations, and both the stations Peter normally uses to get to work, the platforms are only reachable by stair or elevator. As Peter explicitly mentions, the only part of his regular commute which sometimes worries him, is whether the elevators are working.

“(...) what stresses me is whether the elevators work. For example, the other day the lift at Nordhavn Station was out of order when I was leaving home, and I was already behind schedule. I simply had to go to Østerport to catch the train. So, that’s me arriving 20 minutes late for my appointment, then.” 1. 281-285

As we get off the train with Peter at our destination station, we get to experience part of this unwanted excitement as we are met with a couple of technicians working on the elevator (image 5). Luckily for us, they were able to get the elevator working within a few minutes. Unlike the example with bicycle parking at Nordhavn Station which sometimes annoys or inconveniences Peter, a malfunctioning elevator can have a bigger impact on Peters’ commute. In theory, Peter can check the maintenance schedule of all Danish station elevators through a webpage. However, Peter explains that he has had so many experiences with this webpage not being updated or lacking adequate information, that he no longer trusts it. This means that despite spending additional time to stay updated through the webpage, Peter still worries about the status of the elevator at the station he is on his way to.

Malfunctioning elevators, and lack of information about when elevators are out of service, is an obvious example of where the accessibility of the station can be improved for wheelchair users and many other types of users. What is at stake here is more than the odd 20-minute delay on Peter’s way to work. Indeed, all commuters going by train in and out of Copenhagen will experience delays of this length every now and then. The difference is the mental load put on Peter because of his specific needs. This means that, even when the commute goes flawlessly (which, Peter points out, it does most of the time), Peter still worries about whether the elevators are working or not. What we are a witness to here is that Peter’s spatial dependency on a functioning elevator is inseparable from his social dependency on an updated webpage. In his experience of commuting to work,



Image 5.3: Minute 50:57 – Emil's perspective

these two layers of dependency cannot be described independently of each other.

Moving to another example from Peter's commute, we should be sensitive to those examples which might be of benefit to Peter's particular needs but can be detrimental to other types of users. Like most train stations in Copenhagen the platforms fill up quickly during the morning rush hour. This makes space, be it measured by personal comfort or by square meters per person, a limited luxury. Perhaps due to a rising number of passengers at Nordhavn Station (a guess put forth by Peter), some elements like benches and trashcans have been removed from the station to make more space for commuters. For Peter, this has made it easier to navigate the platform with his wheelchair. However, removing objects like benches, trashcans, and information billboards might disadvantage users who, for instance, do walk but needs rest areas and seats while waiting for the train. Not to speak of homeless people or others for whom a clean and dry bench can function as a safe space to spend the night.

“Yeah, so it has become somewhat easier in the wheelchair, but there are many people, especially during rush hour. It’s not so bad right now, but at other times it can be bad, also when you have other obstacles, like station inventory.” 1.181-184

Looking at the elements which were removed from the platform, it is also possible to describe which dependencies such elements supported: the platform now provided fewer places to rest, fewer signs providing analogue information or updates on the train service, and fewer possibilities for getting rid of waste. For Peter this was an overall benefit. It supports his dependency on the platform to provide ample space for him to manoeuvre his wheelchair. This emphasises that decisions made to uniquely benefit a particular group of users implies a risk of putting a different group of users at a disadvantage. Recalling Winance’s critique of universal design, this should not mean reducing the diversity of needs to an ideal one-size-fits all solution. Universal design can sensitise us to the fact that equitable use sometimes means providing more avenues of use towards the same goal. This means representing the diversity of user needs with a diversity of designs fit to service such needs.

5.3 Communicating with the train driver

The official guidelines of the Danish State Railways (DSB) state that when the regional S-train arrives at the station commuters like Peter who have need of a ramp to get aboard the train must be waiting at the end of the platform where the front carriage stops. It is then Peter’s job to contact the train driver and inform the driver that he wishes to get aboard, and which station he wishes to get off on. The train driver needs to exit the driver’s compartment and manually fold out the ramp, significantly increasing the time the train has to remain stopped at the station (see image 5). While formalised,

these interactions between Peter and the train driver are not always smooth.

“You never quite know whether they’re going to see you, some wave back and say, ‘I’ve seen you’ and others just don’t care; they mind their train driving. So you sometimes just sit there and wave, ‘come on, look at me, look at me (...) just give me a sign that you have seen me, please!’ I think that’s a challenge.” I. 185-190

These interactions, and the misunderstandings they sometimes result in, are different from the previous examples because they introduce a large degree of dependency on human interaction. Furthermore, the success of these interactions are pressured by the strict timetable the train drivers have to operate under and the encumbrance of the design of the manual ramp. Peter explains that these interactions sometimes go awry because a train driver misunderstands Peter’s intentions, or because of an uncooperative ramp. What is special about this part of Peter’s commute is that, due to the limitations to the S-train’s design, he exchanges a dependency on primarily non-human and material elements to a dependency on social interaction. As already pointed out by Peter, this can lead to misunderstandings, however it can also lead to positive experiences when train drivers provide more help than is required of them.

“One time, at the central station, a full-length train, by which I mean two normal trains put together, had pulled up along the entire length of the platform. When I came down with the elevator, I made eye contact with the train driver, so he expected me to board the train, but I thought I couldn’t make it in time (...). So he called out, ‘are you coming?’ and I gave full speed, as I felt like I had to try and make it since he was

nice enough to fold out the ramp. If I said 'no, I'm not coming', I would feel that I his time, but in fact it wouldn't be my fault, as he had made eye contact with me coincidentally. It was a little funny (...). When I'm travelling with my assistants and it's their first time, I always tell them that 'when you're with me, we aren't running for the train. (...). The rules say you must be ready at the front carriage when the train arrives, meaning that if the train has already pulled into the station once you get to the platform, it is too late.' 1. 318-331

Situations such as these, the good ones and the bad ones, are unlikely to happen to commuters who do not rely on communicating with the train driver. As he expresses it here, Peter makes an effort at sticking to the guidelines designed by DSB to get him as easily aboard the train as possible. This is because these guidelines, for better or worse, attempt to mitigate a set of bad designs and provide a structure for Peter's everyday commute. They however also subject Peter to a type of dependency not experienced by commuters who are not wheelchair users. In this way, Peter's reflections on getting aboard the train is similar to his comments about elevators. They both exemplify steps to his commute which other commuters do not have to move through, for example checking the maintenance times of elevators on a webpage and communicating with the train driver to get aboard the train.

This is significant because Peter's commute cannot be equitable to those of other commuters when his social dependency significantly outweighs the social dependency of his fellow commuters when getting on and off the train. In this instance, Peter's dependency is layered by his need to use a ramp to get into the train (physical dependency) which for him necessitates waiting on a specific part of the platform and that he can communicate effectively with the train driver (social dependency), while he is also dependent on the patience of his fellow passengers who must wait several minutes before

the train can depart again (cultural dependency). Such a description shows the layers of dependency which Peter is subjected to during his commute. This is what makes his experience unequitable to those of other commuters. No wonder then, that Peter looks forward to the new S-trains arriving sometime in the future, which are promised to have level free access between the platform and the carriage.

The train

As mentioned, getting aboard the S-train from Nordhavn Station involves the train driver manually unfolding a ramp tucked away in an upright compartment next to the door. The day that we are accompanying Peter, this ramp gets slightly stuck which requires the train driver to kick the ramp into position. The noise and the time it takes to unfold the ramp means most people in the carriage become aware of us entering the train, and why the train is waiting longer at the station in the first place. Watching a clip from of this situation, Peter makes the following tongue in cheek remark during the interview:

“Some people are more aesthetic in the way they fold out the ramp. They bend down and gently fold it out, others are just like, ‘let’s get this crap over with’ (...).” l. 192-194

The ramp is one example of Peter’s commute being inequitable to those of other commuters because of the noise and related attention it often generates when unfolded. While Peter emphasises that this system works most of the time, and that some train drivers unfold the ramp carefully, the design only works because of the social system put in place to make up for the physical design’s shortcomings. This introduces a degree of social dependency which other commuters do not experience as they take the train every morning to get to work. This *added* layer of dependency increases the chances of Peter’s flow – his everyday habitual commuting experience – breaking as he is forced to consciously mitigate that his physical dependencies are not being met by the design of the train carriages. Moreover,



Image 5.4: Minute 13:15 – Emil's perspective

the time and space it takes to handle the ramp also demands an increased patience from his fellow passengers. In a tightly packed train carriage during Copenhagen's rush hour, where commuters are culturally dependent on each other to make an uncomfortable daily ritual as smooth as possible, this can lead to Peter being the center of unwanted attention:

“In the vast majority of cases, the folding out happens nice and easy and discreetly, but obviously if you're in a fully packed carriage with plenty of other people, and somebody like him [the train driver in the video] begins to hammer or smash the ramp pretty hard into the ground, and kicks it to get it all the way down, then people tend to notice you're sitting there in your wheelchair (...) I know that if I'm on the

train myself and another wheelchair user needs to board it, then you notice it more acutely if someone is forcing the ramp into position. I think people are nice and kind, and make room for me, and I don't think I'm better or worse off than others on the train, in terms of space. I think everybody is trying to make it work." 1. 221-232

What is important to emphasise here, especially when dealing with situations such as a rush hour commute on a busy public transit line, is that just as *equitable* does not mean an *equal* experience, it also does not mean a better experience. Inside the front carriage of the S-train there is a designated area for wheelchair users marked by the commonly used wheelchair pictogram. The designated area is next to the bicycle stands of the train and is a particularly crowded area of the train during rush hour (see image 5). As the following quote by Peter underlines, such situations can cause discomfort, however he also frames this discomfort as a condition for using public transit during rush hour:

"I don't feel like I'm worse off than others, but with my seated position among standing co-travellers it's annoying, of course, to have other people's bags bumping into my face when people move about (...) but other than that I think people are considerate. It is, also, a condition when using public transportation; there are other people on board than yourself, naturally." 1. 265-270

The two final quotes emphasise the intersection of the multiple different dependencies which form inseparable layers in Peter's spatial experience. By describing this plurality of dependencies, and how they overlap, we can become sensitive to the details of such complex situations. Presenting universal design as such also means



Image 5.5: 17:18 – Emil's perspective

putting up certain limitations for how universal design can be utilised to supplement your existing qualifications as a designer, architect, urban planner, or similarly engaged profession.

5.4 Discussion and conclusion

We started our chapter by introducing an alternative understanding of universal design. One which deploys universal design as a sensitising concept which does not attempt to provide universal solutions but instead provides a plurality of descriptions. By following Peter on his commute, we have attempted to exemplify the type of insights we believe universal design can bring to practitioners within the build environment. These insights are based on describing the different

ways in which people are dependent on their environment, and how design decisions can enhance or diminish such dependencies. The benefit of universal design is that it can sensitise us to instances in which the dependencies of some people are ill supported by the environment or at odds with the decisions to prioritise the dependencies of other groups.

However, universal design does not provide answers for what good design looks like in specific situations. It can at best describe what good design does, and what to look for when describing why design is implicitly or explicitly discriminatory for some groups. In the case of the S-train ramps, it seems an obvious suggestion that new trains should be designed to provide level free access between the platform and the carriage. According to Peter, this is already a requirement of the next generation of S-trains supposed to arrive within the next decade. However, if Peter cannot get to the platform because the only elevator is down for maintenance, does this suggest that it might be better to build another elevator at the station than to invest in new trains? Should we do both? Does it even help to do one without the other?

We cannot expect to solve questions such as this with a single solution. Instead, we should focus on the diversity of services necessary to provide an equitable experience sensitive to the variance in cognitive and physical abilities we possess as human beings (Winance, 2014, p. 1341). An interpretation of this argument is that multiple design solutions are necessary, as any one single solution will never be able to encompass or respect human diversity. Based on the example of this chapter however, universal design could (and should) also sensitise us to those dependencies which are not solely based in physical or digital design. Meaning that universal design should provide descriptions of both social and cultural dependencies in addition to those of design. In the case of Peter's commute, such a plurality is represented by the fact that it is impossible to separate Peter's interaction with the train driver from the guidelines of where he should be positioned on the platform, as well as from the current state and functioning of the manual ramp of the train. It is the potential of universal design as a sensitising concept – directing

our gaze at these simultaneous physical, social, and cultural forces in space – that we believe is its biggest strength. As supported by the interdisciplinary focus of this anthology, this necessitates that universal design moves beyond its mono-disciplinary beginnings within architecture.

As a sensitising concept, however, universal design does not indicate *how* to look – be it through interviews or user journeys – it defines *what* to look for. This is the price which universal design needs to pay to be able to provide valid descriptions of the layers of dependency which exist between human beings and the environments we construct for ourselves.

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6.0

Universal job design

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Introduction

In this chapter, we will explore what it means when we apply the concept of universal design to the Danish labour market. We present a new concept, which we term *universal job design*. Universal job design is inspired by the principles and goals of universal design and is about designing workplaces and jobs to be accessible to all, regardless of abilities. This means shifting the focus from a reactive approach (compensation and workplace adaptation) to a proactive approach (prevention and diversity). This can help increase employment for people with disabilities and create a more inclusive labour market.

We start with a brief overview of the situation and developments regarding disability and employment in the Danish labour market. We then review the limited literature on universal design and workplaces. Then, drawing on the literature, we develop a definition of the universal job design concept and, following this, present the experiences of two organisations that have been working with universal job design (Enactlab and Group M). Finally, we discuss the challenges and potential of applying the concept of universal job design in the Danish labour market.

6.1 Disability and the labour market

The Danish labour market is usually considered to function well (cf. Bredgaard & Rasmussen, 2022), but it does not work equally well for all groups. One of the groups facing difficulties in the labour market is people with disabilities. In 2021, 61% of people with disabilities were in employment, compared to 86% of those without disabilities. The employment gap was thus 25 percentage points. In terms of people with a major disability, 39% were in employment. The employment gap to people without disabilities was thus 47 percentage points (Larsen, Jakobsen & Mikkelsen, 2022).

People with disabilities are an untapped labour resource. Among unemployed people with disabilities, 26% indicate that they want

a job but are not looking for one, while 13% are actively looking for work (Larsen, Jakobsen & Mikkelsen, 2022). According to calculations from Disabled People's Organisations Denmark (Danske Handicaporganisationer), this means that approximately 33,000 people with disabilities would be ready to take a job within 14 days. As a result, companies are missing out on labour, and businesses and jobseekers with disabilities are not being matched optimally. At the same time, major socio-economic benefits can be gained when more people with disabilities are in employment or in the Danish Flexjob scheme (COWI, 2014).

There are many reasons for the lower employment rate among people with disabilities. Firstly, research has shown that there are barriers in labour supply among people with disabilities; for instance, functional impairments that prevent certain types of work and lead to lower educational attainment, lower self-esteem and smaller social networks. Secondly, there are barriers in labour demand among companies, such as a lack of accessibility, job functions and knowledge, as well as prejudices where impairment is equated with reduced ability to work (Lid, 2021; Louvet, 2007; Rohmer & Louvet, 2009, 2012; Novak et al., 2011; Grue, 2016). Thirdly, there are barriers in matching supply with demand through the employment services, for instance a lack of identification and registration of impairments (see Bredgaard et al., 2020).

In this article, we focus on the barriers in labour demand that are related to workplaces not being designed or adapted for people with impairments. We know from previous studies that many workplaces are not accessible to people with disabilities (wheelchair users, among others) or do not offer jobs suitable for people with disabilities (cf. Bredgaard et al., 2020; Krogh & Bredgaard, 2022). For example, in a survey from 2019, half of all Danish employers indicated that their workplace was either not at all or only slightly accessible to people with mobility impairments. In addition, 56% of employers in the same survey reported that they had either no or few job functions for people with mobility impairments (Shamshiri-Petersen, Salado-Rasmussen & Krogh, 2020). Many people with mobility impairments also perceive the lack of accessibility as a barrier to finding

a job and state that it would discourage them from applying for jobs in the relevant workplace (Thuesen & Salado-Rasmussen, 2020).

The question is whether the principles of the universal design concept can be applied and transferred to the labour market and contribute to creating more inclusive workplaces for all, regardless of abilities?

6.2 Existing literature on universal design and the labour market

We start by summarising the findings from existing literature that applies the principles of universal design in the labour market. We conducted a literature search in scientific databases (Proquest, Web of Science, Scopus, Google Scholar, etc.) as well as *grey literature*. We used search terms such as *universal design*, *accessibility*, *inclusion*, *work*, *job*, *labour market*, etc. in both English and Danish. The literature search showed that universal design has only been applied to a limited extent in relation to the labour market. We identified a total of 16 publications and summarise the main findings below.

The first finding is that the concept of universal design in principle eliminates the distinction between people with and without disabilities or impairments (Lid, 2021; Ryhl, 2009). Everyone has varying levels of functional ability. In the labour market, it is also true that everyone has different work-related abilities. A universally designed labour market is about valuing the diversity of functional and work-related abilities. In this context, Lid (2021) argues that the concept of *inclusion* signals an asymmetry between those who already belong to the labour market and those who are excluded and need to be included (e.g. people with disabilities).

Another finding, emphasised especially in an American context, is that universal design entails a shift from reactive processes of workplace adaptation to a proactive process of designing the workplace to ensure all employees' talents are optimally utilised, regardless of their abilities (Sheppard-Jones et al., 2021). This requires universal

design to be considered at all levels of human resources policy, such as job advertisements and recruitment, the physical and psychological working environment, workplace technologies and tools, communication and safety procedures, work culture, social community, etc. (see Sheppard-Jones et al., 2021; Lid, 2021; Sanford & Stark, 2015). This point also illustrates the difference between accessibility and universal design. Accessibility is about workplace accommodations, where special solutions are designed or adapted for the user with an impairment (ramps, handrails, lifts etc.) (Zolna et al., 2007). Universal design, on the other hand, is about designing a solution that can be used by everyone (hence the related term *design for all*).

The third finding is that universal design in the workplace can be a good investment. For example, advocates emphasise that universally designed workplaces will not lead to additional costs for subsequent workplace adaptation, that they will give rise to more satisfied and productive employees, that they are able to retain older workers and that they provide access to a larger talent pool for recruitment (see Sheppard-Jones et al., 2021; Sanford & Stark, 2015; Mueller, 2011). This also applies to workplaces that offer teleworking, which is seen as a way to include more people with (physical) disabilities in the labour market (Allen, Golden & Shockley, 2015; Schur, Ameri & Kruse, 2020).

The sparse literature on universal design and the labour market is primarily focused on making the workplace physically accessible for all, and less on the issue of job design and task design (cf. Mueller, 2011). We found only a small number of studies on how the principles of universal design can be translated into practice and realised in workplaces, and no concrete empirical studies on the economic, social and human resource implications of universal design in workplaces. However, several articles argue that the need for universal job design will increase in the future as the workforce ages, with more employees staying at the workplace for a longer time and experiencing impairments in the latter part of their working life (see Fok et al., 2009; Matt et al., 2015; Brynn, 2021).

6.3 Universal job design

In the following section, we will define the concept of universal job design. We will do so based on the concept and principles of Universal Design (UD) and will then translate and transfer these to the labour market.

The concept of universal design was defined in Chapter 1. Paraphrasing Ronald L. Mace's well-known definition, one could say that universal job design is:

A way of designing a job and workplace at little or no extra cost so that it is attractive and functional for all people regardless of ability.

(cf. Mace, 1985)

A universally designed workplace is one where everyone has equal access and is treated equally, which applies to people with and without disabilities.

This broad definition is closely aligned with the UN Convention on the Rights of Persons with Disabilities and the obligation to prevent discrimination and to create open, inclusive and accessible workplaces for all (see Article 27 of the UN Convention on the Rights of Persons with Disabilities). The UNCRPD Action Plan defines universal design as *"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 design"* (Mathiason, 2011).

The definition of universal job design can be further refined in relation to the seven principles of universal design formulated by Mace and colleagues in a further development of the concept (Center for Universal Design, 1997). We have translated and transferred the original descriptions of the principles to adapt them to the labour market. In each case, we have translated *design* into either *the job*, *the tasks* or *the workplace* (see Table 6.1).

TABLE 6.1: FROM UNIVERSAL DESIGN TO UNIVERSAL JOB DESIGN

Principle of universal design	Principle of universal job design
<p>1 Equitable use: The design is useful and marketable to people with diverse abilities.</p>	<p>The workplace is accessible and inclusive for all and does not discriminate against anyone.</p>
<p>2 Flexibility in use: The design accommodates a wide range of individual preferences and abilities.</p>	<p>The tasks can be completed using a variety of methods and abilities. The job is tailored to the employee and can be done at the employee's own pace.</p>
<p>3 Simple and intuitive use: Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.</p>	<p>The tasks are easy to understand and tailored to the abilities of the employees.</p>
<p>4 Perceptible information: The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.</p>	<p>The workplace offers the necessary information in a simple way, e.g., through pictures, speech or tactile information.</p>
<p>5 Tolerance for error: The design minimises hazards and the adverse consequences of accidental or unintended actions.</p>	<p>The workplace minimises and warns about risks and errors as well as offers measures to promote safety.</p>
<p>6 Low physical effort: The design can be used efficiently and comfortably and with a minimum of fatigue.</p>	<p>The job can be performed with limited physical effort. The employee can be in a body-neutral position and does not need to repeat the same movement several times.</p>
<p>7 Size and space for approach and use: Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.</p>	<p>The workplace offers all employees sufficient space and access to all work tools.</p>

Source: Center for Universal Design (1997), adapted to the labour market.

This rewriting shows that applying universal design to the workplace is a major and complex task. For example, it requires the workplace to be accessible to all regardless of abilities (principles 1 and 7), that tasks are tailored flexibly to the individual's abilities (principles 2, 3 and 6), and that the workplace uses different forms of communication (principle 4). This illustrates that adhering to the Convention on the Rights of Persons with Disabilities' principle of open, accessible and inclusive workplaces for all is challenging in practice. It is therefore important in this context to recall that universal design is not an absolute standard or a concrete goal but should be seen as a dynamic process and an ideal (cf. Steinfeld & Maisel, 2012).

In a further refinement of the principles of universal design, eight overarching universal design goals have been developed, which the dynamic design process and ideals can aim for. These goals were developed by *The Center for Inclusive Design and Environmental Access* in 2012 as a way to make it easier to work with universal design in practice. The goals are categorised into three areas: Performance, well-being and social participation (Steinfeld & Maisel, 2012). Again, we have translated and transferred these goals to the labour market. (see Table 6.2).

TABLE 6.2: FROM UNIVERSAL DESIGN GOALS TO UNIVERSAL JOB DESIGN

Goals for universal design	Goals for universal job design
1 Body fit	Accommodate a wide range of body sizes and abilities in the workplace
2 Comfort	Ensure work demands are kept within reasonable limits in relation to bodily function
3 Awareness	Ensure that necessary work information can be easily understood
4 Understanding	Ensure that workplace controls are clear, unambiguous and intuitive
5 Wellness	Contribute to health promotion, illness prevention and protection against accidents at work

- | | |
|------------------------------|---|
| 6 Social integration | Treat all groups in the workplace with dignity and respect |
| 7 Personalisation | Incorporate choices and opportunities to express individual preferences in the workplace |
| 8 Cultural adaptation | Respect and reinforce cultural values and the social and environmental context of any design project in the workplace |

In the following, the principles and goals are specified further by applying them to Danish labour market conditions. This can help to illustrate challenges and opportunities in applying the concepts in practice.

Equitable use is fundamentally about equal treatment in the labour market and can be seen as the overarching principle to which the other principles should contribute. The goal is that everyone, regardless of abilities, has equal access and opportunities in the workplace, and that there is no discrimination of people with impairments (Goals 6 and 8). In Denmark, these issues are regulated in the legislation on physical accessibility (building regulations) as well as in the legislation on non-discrimination in the labour market and compensation for people with disabilities in employment (for example through personal assistance, assistive devices, preferential access, wage subsidy schemes). The main challenge is to translate legislation into practice so that, for example, there is no statistical discrimination in recruitment processes, or that buildings are not inaccessible for people in wheelchair.

Flexible use is about adapting the workplace to differences in individual preferences and abilities. The workplace should try to tailor work tasks to the abilities and functions of employees, rather than the other way round. This goal addresses both performance and participation and relates to the fact that the workplace should be able to adapt work demands to the different bodily functions, abilities and preferences of employees (Goals 1, 2 and 7). In a Danish context, inspiration can be drawn from the design of the Flexjob scheme, where the job is tailored to the individual's abilities, e.g. reduced working

hours and work intensity (cf. Bredgaard, 2020). Similar notions are also reflected in concepts like *Individual Placement and Support*, *Supported Employment*, *Customised Employment* and *Job Design* (cf. Bonfils, 2022; Bonfils et al., 2020; Larsen & Høgelund, 2014; Frøyland & Spejlkavik, 2015; Drake et al., 2012; EUSE, 2010; Hackman & Oldham, 1980).

Simple and intuitive use means that the job and tasks are easy to perform regardless of abilities. The goal is to reduce complexity so that any job or task is easy to understand, simple and intuitive (Goal 4). Again, inspiration can be drawn from the notion of tailoring the job to the person rather than the other way round (see above). However, it is hardly possible or appropriate to change all jobs and tasks so that they are simple and intuitive for all employees. It is probably more realistic to find jobs and tasks that are tailored to the conditions of employees with disabilities.

Perceptible information should ensure that all employees, regardless of abilities, receive the necessary information to fulfil their work assignments and function in the workplace. The workplace should therefore use as many different forms of communication as possible (e.g. images, text, sound, voice, vibration) and ensure digital accessibility with the aim that all information is easily understandable.

Tolerance for error is about well-being, and the aim is to create a healthy and safe working environment for all employees, regardless of abilities (Goal 5). In a Danish context, this is about creating a good working environment and a safety culture that complies with the rules of the Working Environment Act.

Low physical effort is about limiting the amount of physically demanding work tasks with the aim that the work demands are reasonable in relation to bodily function (Goal 2). The increasing automation and digitalisation of many workplaces is reducing the amount of physically demanding work. Furthermore, the Danish trade unions have fought for decades to improve occupational health and limit the scope of repetitive work. However, there are still many jobs that require physical exertion and, as mentioned earlier, many employers do not believe they have job functions suitable for people with disabilities (cf. Bredgaard et al., 2020).

Size and space for approach and use is about the physical design of the workplace to ensure that everyone, regardless of body size, abilities and preferences, can access and move around the workplace (Goals 1 and 7). As mentioned above, we know that many Danish workplaces are not sufficiently accessible for, among others, employees in wheelchairs (cf. Krogh & Bredgaard, 2022).

This is an attempt to translate the principles and goals of universal design into universal job design. In the following, we will provide some practical examples from two selected organisations that have been working with the principles of universal job design.

6.4 Examples of universal job design

The first example is **Enactlab**, an organisation working to create socially sustainable change through research translation and consultancy. Enactlab is a small organisation with less than 20 employees. It was created in 2018 by one of the authors of this article, Kristian Moltke Martiny, and Jacob Nossell, who lives with cerebral palsy. From the outset, diversity was considered a key strategy in Enactlab, e.g. in terms of the composition of staff and board members, the work culture and the working community. This means that, in the few years since it was created, Enactlab has employed a number of staff with varying abilities, including people living with cerebral palsy, depression, stress, anxiety, Parkinson's disease and hearing impairment, as well as relatives of people living with disabilities or chronic illness. Recruiting people with varying abilities has not been difficult in Enactlab, as the values of the organisation and strong collaboration with disability and mental health organisations have resulted in a diverse recruitment base.

In terms of creating a universally designed workplace, the starting point was to use existing municipal schemes such as the Personal Assistance scheme (BPA scheme), the flexjob scheme and other subsidy schemes to cover specially designed furniture, technologies and additional travel costs. Work and the workplace were tailored and

designed for the individual person with disability or mental health challenges, in terms of ensuring suitable working hours, chairs, tables and technologies, for example, as well as by including their personal assistant in the work processes and social events.

While there has been a conscious focus on creating an open and diverse culture at Enactlab, there have still been a number of challenges. With one or more staircases, the buildings that house Enactlab have been difficult to access, and the workplace is in an open-plan shared office space. For some employees with physical disabilities and mental health challenges, it has been difficult to work in an open office environment and/or to enter the workplace. This means that several employees work from home and only come into the workplace once or twice a week. Although it was not the intention, this has created a division between those working from the office and those working from home, with those working from the office participating in the work culture to a greater extent. In relation to social events (summer parties, Christmas parties etc.), the aim has always been to ensure that everyone could participate in a positive way. Nevertheless, certain social events that have been organised have excluded some of the employees.

Overall, the development of a work culture at Enactlab has shown that, despite the organisation's best intentions, everyone can make mistakes, overlook certain perspectives and exclude some employees. Therefore, universal design solutions are not about *one-to-one* implementation and operationalisation, where there are right and wrong solutions. Rather, the aim has been to create an open, listening culture where employees can constructively articulate internal challenges and mistakes and together identify what makes sense for everyone.

The second company *Group M* is the largest advertising and media company in Denmark with around 500 employees. In collaboration with Enactlab, Group M is developing its own approach to universal design, operating across two initiatives called *Equal opportunities for all* and *Accessibility*. The first initiative is about developing a core narrative in Group M where everyone can find their place in the organisation and do the work they are employed to do, regard-

less of their abilities. The second initiative concerns how the job and the workplace can be designed to be accessible to all.

Group M's focus on universal design emerged when one of the few employees with a physical disability pointed out to management that she was sometimes excluded in the workplace because of the physical environment, the social community and the events they organised. Management took this seriously and initiated development work with the aim of creating a more open and diverse workplace. Overall, however, the problem is that there are very few people with physical disabilities and mental health challenges employed in the organisation. Creating a diverse workplace is therefore first and foremost about designing the job search and recruitment process with an eye towards universality and inclusivity, ensuring greater diversity in the workforce able to apply for the job in the first place.

Just like Enactlab, Group M's physical environment is another challenge. The workplace consists of a number of different open-plan office communities and is located in a building with many stairs, where the lifts are small and inaccessible to large wheelchairs or mobility scooters. Management is open to making physical changes, but this is very much a *cost-benefit* assessment, as they obviously only want to make changes that are necessary to create a more diverse workplace and that do not require a major and expensive renovation. This is also because, in addition to the two new universal design initiatives, there are a number of existing initiatives such as *Equal Pay*, *Parental leave*, *Stress*, *Mental Health* and *Women and Careers*. The implementation of these existing initiatives also requires resources, and meeting the needs of a diverse workforce is always a balancing act.

Group M, like Enactlab, does not want one-to-one implementation and operationalisation, creating a series of correct solutions to their diversity challenges. Group M wants to develop a diversity model to deal with problems and challenges as they arise in the organisation, from the bottom-up, based on the socio-economic and physical conditions that define the company.

6.5 Discussion of potential and challenges

Universal job design is an ideal with the potential to create a more inclusive labour market for groups with different preferences, needs and abilities. It makes sense to design workplaces and jobs universally so that everyone can participate in working life, regardless of abilities. This is particularly true with an ageing workforce and the need to extend working lives, as well as the need to recruit skilled labour and tap into the talent pool. A workplace with a universal job design is proactive and inclusive for everyone, regardless of abilities. In conclusion, we would like to highlight four challenges that are important when translating and applying the principles of universal design to the labour market.

(1) The first challenge is about the need for workplace adaptations. When is the workplace sufficiently universally designed so that individual work adaptations become redundant? And to what extent are specific workplace adaptations necessary to ensure the equal treatment of people with impairments? Might individual workplace adaptations actually be a necessary precondition for achieving a universally designed workplace? Is the universally designed workplace without specialised workplace adaptations for employees with impairments really just a desirable but unattainable ideal? In this context, it is essential to view universal design as a process rather than an end goal, or as an ideal rather than a standard. Universal design is a design principle that can be pursued in the organisation and design of the workplace so that it works for everyone, regardless of abilities. However, when it comes to implementing universal design, it can be difficult to work towards the design principles as an ideal, and the eight goals of universal design can be useful in this context. This means clarifying universal design through the relationship between the ideal, goals, principles and standards it embodies.

(2) The second challenge relates to the lack of clarity in defining the target groups for universal design. In this sense, universal design eliminates the dividing line between people with and without impairments and is about design for all, regardless of abilities. However, in relation to the need for workplace adaptation, it follows that it

is necessary to tailor (design) the workplace, job or tasks for specific target groups in order to ensure equal treatment. It is therefore unclear how the *universal* of universal design can be operationalised. Some existing literature removes the discussion of impairment and instead focuses on varying abilities and diversity.

(3) *The third challenge is about job search and recruitment.* In the existing literature, universal design is primarily about equal treatment and anti-discrimination in the workplace, and less about the job search and recruitment process. As a result, universal design does not prevent discrimination during recruitment processes, but may help to reduce it if the workplace functions for everyone regardless of their abilities.

(4) *The fourth challenge is about the cost of universal job design.* Is it worthwhile for employers and society to invest in organising the workplace according to the principles and goals of universal design? There is a lack of robust studies and evidence on the economic benefits and costs of organising the workplace according to universal design.

If the principles and goals of universal job design are to be more fully translated into practice, we must find convincing answers to these challenges and experiment more with universal job design in both practice and research. Universal job design is an interesting and relevant concept that promotes a strong user focus, a focus on job design and a new understanding of work.

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7.0

Asking the right question – guiding universal design practices

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Introduction

Studies have shown that universal design has not yet gained large traction in Danish architectural policies (Grangaard, 2018). This is much the same amongst Danish practicing landscape architects and architects, of whom many acknowledge a gap in the professional knowledge surrounding what is currently referred to as matters of accessibility (Gramkow et al., 2022; Kajita, 2020). A major obstacle for universal design to overcome is therefore how the concept can be put into practice during the busy everyday design processes of architectural offices (Kirkeby, 2015) and how it differs methodologically from discussions of accessibility. Therefore, this chapter attempts to clarify the concept of universal design by developing a list of guiding questions that can be used in architectural practices.

The guide provided by this chapter takes the shape of a list of *frequently asked questions* (FAQ) in design processes, and how an alternative to such questions might look if we were to put on our universal design glasses. Throughout the chapter we invite you to think about what questions structure your work, and how these might be altered in what ways, to change your perspective and the perspective of external stakeholders you will find yourself working with. This also means the list of questions presented at the end of this chapter is by no means final. The list is meant to help you towards an alternative way of structuring your design practice when possible. We invite you to continue to add your own questions to it, so that it might work as a quick reference sheet to look at when you are faced with an impasse in a project, or just in need of inspiration. We imagine these questions can be used within your architectural practice, either as a guide in your own work, or discussed out loud with your colleagues.

Why a list of questions, you might ask? Because professional vocabularies, and how we frame our knowledge through our choice of words and concepts, matter. As designers we need to be reflective of the fact that the world is in part given shape by our theories and working methods (Schön, 1991). Therefore, the questions we ask when designing, both those asked explicitly and those which structure our process implicitly, will shape both what we design and how

we go about designing it. It is important to say that this is not an invalidation of what you have been taught so far either by experience or by training. This is why we invite you to use, add, and alter the list of questions to fit your needs. In addition to guiding you in your design process by making it possible for you to have a more reflective practice, there is another significant argument for why establishing a list of questions matter.

As practitioners we are constantly confronted with our dependency on external stakeholders who are not native to the architectural tongue (Till, 2013). This is not a unique challenge. What is particular to architecture and landscape architecture is that the design of space, and the building sector at large, is a field inhabited by many overlapping professions. This means architects, landscape architects, engineers, and many other professions have to share their expert status (Meilvang & Blok, 2019). Therefore, arguments and methods which appear self-evident to the trained architect or landscape architect may be challenged or misunderstood during design processes by other stakeholders. The experienced practitioner will therefore need to learn how to navigate in this cross-disciplinary network, in order to translate and communicate issues of architectural importance (Star & Griesemer, 1989).

This brings us back to why questions matter. Any half decent translation rests upon an explicit and reflective understanding of the language which is being translated. In other words, this chapter argues that before we can successfully introduce universal design to design processes, whose pragmatic success rests upon more than the discussions we can have internally in architecture, we must start with understanding the questions we ask and how we might alter them.

Empirical background and structure of the chapter

The list of questions presented in this chapter are based on an interview study conducted with 15 experienced landscape architects from randomly selected Danish landscape architectural firms of all sizes. Many of which also conduct architectural projects. The interviews were conducted and analyzed by the authors Marcus Tang Merit (a sociologist) and Marie Christoffersen Gramkow (a land-

scape architect) in connection with a study of how Danish landscape architects work with and understand accessibility (Gramkow et al., 2022). The interviewed landscape architects had between 9 and 29 years of experience and were all working as a project manager or in a more senior position within their company. This means the questions presented by this chapter are based on the experiences of Danish practicing landscape architects and reflections from other studies on architectural practices (Kajita, 2019). From these empirical studies the authors combined their sociological, architectural, and landscape architectural backgrounds to produce the questions presented below. For this reason, we will not explicitly refer to architects or landscape architects as we believe the presented questions are applicable to both professions. All interviews have been translated from Danish by the authors.

The following sections are split up into sub-sections according to various themes. Each sub-section should be read as a semi-independent analysis which concludes with one or more questions. The quotes we have chosen to include in each sub-section serve to support our argument and to provide an alternative description of what we are trying to convey.

7.1 Experiences from practice

“Generally, we think our clients should experience an exciting and fun process. That being said, we are advisors and professionals, we are mercenaries who do what we are asked to, within a given economic framework, and if the client does not request anything special related to accessibility, they won’t get it. Especially not if it costs, then they won’t get it at all, because then they wouldn’t want it. You can’t force something down people’s throat if they do not want it. That’s

where the building regulations and other things might say 'you have to do this', and then you can have your personal opinions as an advisor, I have, but you shouldn't air them, because that isn't what the client is requesting."

In practice many topics compete for the attention of practitioners. These topics are often related to issues that span across several professional boundaries, such as social sustainability. Oftentimes what comes to occupy daily work are negotiations of issues which relate to both professional expertise, pragmatic considerations, and the particular wishes of clients. In these negotiations, landscape architects and architects can often but not always be perceived as consultants who guide and influence decisions without the power to dictate the goals and final solutions of a project. As we will show below, while this is the professional reality of many projects, it does not negate the impact you can have as a practitioner. If anything, this is arguably a general condition for most professions out there. One way of making sure our professional suggestions are taken seriously in a project is to know when to ask questions, what these questions might be, and who or what we should direct our questions towards.

Building regulations, and when to question them

Let us begin with what some would say is both the biggest hurdle and sometimes the biggest hammer in the argumentative toolshed: Building regulations, standards, and guidelines in all their myriad forms. Quite simply, most projects, and particularly the ones placed in an urban context, will be heavily limited by the number of square meters swallowed by the plethora of regulatory demands for everything from fire escapes to parking lots. The point here is not to criticise or comment on the specificities in Danish regulations – the point is that technical demands are important to the daily work of practitioners:

“There are just a lot of technical demands by now which you have to satisfy (...) Also, we want some softer values implemented in our projects, but actually a lot of it ends up being about technical installations. Here, our views often differ from those who have a stake in such solutions. A client will not always show an understanding for improving conditions beyond the actual regulatory demands. Every now and then you could wish for that, (...) ‘the good client’ who is able to see beyond his own interests and his cheque book and say ‘oh, wouldn’t it be nice to pay a little more attention to accessibility’ or some other matter, right?”

Regulations can quickly result in minimum standard solutions which ensure at least some level of accessibility in the project. The issue with such standards arises when they cannot be adapted to the spatial context of the project. This can result in designs based on technical demands which subtract rather than add to the quality of the project. Here one could hope for a good client which can see the added benefits to going beyond what is legally required. However, hope is not a viable strategy for professionally responsible consultants. In such instances it is important to have constructive arguments at hand for why an investment now can help mitigate significant headaches later. To formulate such arguments, it is necessary that you understand the overarching goals of your client. If the client has a hard time putting such goals into words, it could be seen as our professional responsibility as consultants to ask these difficult questions, and help the client move towards an answer that respects the goals of the project and your professional expertise.

Given we have completed this collaborative exercise with the client, there will be times in which our gaze is best directed towards the guidelines and standards encapsulating the project. These rules, while perhaps not particularly tailored to your spatial context, are

based on concerns pertaining to a host of societal challenges. Much in line with the tone set by this chapter, the way these concerns are translated into specific guidelines are not above questioning. Sometimes, knowing when to question these can significantly improve the outcome of certain seemingly unsurpassable issues:

“I think you should be allowed, too, to be sceptical about standards, with the intention of doing a better job. I mean, if our inquiries into whether some details can make a better solution than those formulated in existing standards, then we can challenge such standards and maybe even change them, if we’re really competent. We are not there yet, but there is a lot to be done, and it is an... compared to how long people in our world have been bound to wheelchairs or blind... incredibly short time that we have been working seriously with making our society accessible for these groups. So, there are definitely good ideas that nobody has come up with yet.”

It is important to keep in mind that it is easy to question guidelines, more difficult to question standards, and almost impossible to question regulations. As the quote above indicates, it is rare for a context to occur in which you can produce an accepted alternative to existing standards. Doing this requires a great deal of confidence in your knowledge about the needs of users with disabilities for example, and a more fruitful line of questioning will often be to ask why a project is having such troubles adhering to various guidelines, standards, or regulations. Sometimes this involves asking the difficult question of whether the project would have even considered accessibility if it was not a legal requirement to do so:

“My perception and immediate approach to accessibility as a landscape architect probably could be expanded to also articulate the accessibility of green areas. (...). But, if I have to be completely honest, I think more attention will only come if actual legal requirements are introduced. Like with LAR [local rain drainage], where implementation everywhere was legally required, or sustainability. I think this is because working days are so tightly scheduled from a time perspective. If we had more time, we could also reflect more and go deeper into the assignments.”

As we can see from the above quote, building regulations are an effective tool to increase awareness around a theme or issue, which is further elaborated below:

“So, it is an important part, and an increasingly larger focus area, especially after the new building regulations around universal design and the accessibility paragraph about everybody having equal right of entry (...) but it also means we are attentive from beginning to end. Especially in relation to level free access, which was implemented some years back.”

Here, one benefit of the building regulations is their ability to delegate attention to certain areas by demanding minimum standards. Building regulations, however, provide static measurements and guidelines for projects to follow. Adapting such static rules to the plasticity of varying spatial context is an important topic for professional reflection:

“It’s continuously about removing the thing about automatically taking a rule for a rule. Not to be a rule breaker but to continue to maintain the creativity, you might say, without sounding silly, and to maintain the challenge in what you’re doing. To make sure things don’t ‘freeze’ in one way or another. (...) The complacency I constantly struggle with at the office. Because you easily fall into taking a recipe and just going with it. So it is an continuous struggle for all of us: ‘Come on now, we have to stay agile. It can’t be that it has to be so ugly just because we have to solve an accessibility issue.”

In other words, when designing spaces allocated for technical or regulatory demands, it is about perceiving these tasks as equally deserving of an explicit landscape architectural and architectural focus. We must not forget our overall professional responsibilities simply because the task at hand is defined by a regulatory context rather than a spatial or social context. Remember that in our profession laws can impact architecture as much as the topography and programme of a project (Yaneva, 2018). Returning to the point of this chapter, what we have presented here can be summarised as three sets of questions. One A) makes sure you are certain of the client’s goals for the project in order to B) know how to best work within the boundaries set by regulations, and C) when to question these. A takeaway point is that questioning guidelines is not without merit, but doing so should not be your immediate solution to a problem your project might face.

RULES

A Narrow questions

- What are the success criteria of the space I am/we are designing?
- How are the client's goals related to the projects' process and how are they related to the finished space?

B Semi-open questions

- What are the particular spatial and social context of the project that makes it stand out?
- How can I/we integrate regulatory demands with what gives quality to the space?

C Open questions

- What knowledge is required to understand the purpose of regulations in our spatial context?
- Are specific regulations adversely affecting the purpose for which they were created?

What is a reasonable amount of space for people with disability?

Moving away from general questions surrounding how we approach building regulations in our practices, it seems appropriate to return to a more pragmatic question. When interviewing the landscape architects, we found that questions of limited amounts of space, especially in an urban context, took up a significant amount of work in their daily practices. The purpose of this section is to show how universal design can be tied to the pragmatic issue of lack of square meters. A part of the answer here is to stop thinking of particular areas of space as allocated solely for people with disabilities:

“And then my next comment will probably come across as a little controversial, and it is actually not meant as a provocation, because I actually believe it is amazing that 90% of the built environment in 2021 is actually fully accessible for all groups, but, by God!, does it take up a lot of attention compared to all other user groups. How can it be that the, let’s say, relatively few people with a handicap gained that much influence on the built environment compared to other user groups?”

This frames the exact potential of Universal Design: if successfully implemented, design elements currently thought of as accessibility solutions for a specific group of people can be of benefit to most of us. Of course, this requires that we stop thinking of, for example, the ramp as a space consuming requirement, and instead ask what quality it, as one of the oldest construction techniques we possess, can provide for users of the space in question (Hendren, 2017). The point is to turn our perception to the possibilities that spatial elements and physical objects provide (Kajita, 2017). In this process, universal design is not an argument for abandoning your aesthetic and professional expertise within landscape architecture. On the contrary:

“However, I do not think that the whole aesthetic aspect of developing these solutions has been sufficiently challenged. I mean, in reality, the way it expresses itself in landscape and building architecture is very stiff. It also does not seem... well, yes, when you are working on the project and you listen to the disabled users themselves, when you actually get an opportunity to sit down with them, then it seems they have a tendency to be a lot more flexible and open to other solutions.”

If reoccurring observations have taught us to associate elements meant explicitly for people with disabilities with inflexible, space consuming, and ultimately unsatisfying solutions it is no wonder we try to limit the space consumed by such elements. By reflecting on previous encounters with people with disabilities, the interviewed landscape architect, quoted above, emphasises an important professional critique of existing solutions. This is a lesson for all of us to be mindful of our preconceptions when we design. If we ask, when allocating it, what a reasonable amount of space for people with *special needs* is, we might instead ask what makes us ask such a question? Perhaps, as the example here indicates, you have seen one to many steel ramps introduced into a landscape as an afterthought, and

therefore learnt to associate space for disability with unsatisfying landscape architecture. In turn, such a connotation between ramps and poor landscape architectural quality can lead us to structure the design process around limiting and hiding away the space allocated specifically for people with disabilities. Being conscious of this can help you rethink the premise for your design process:

“But if I had to make an accessibility strategy, it would not be about defining the good outdoor spaces are, it would be about the flow strategy. So, where can you pass, where can you stay, where are the good spaces, and how do you create them? So it would be more orientated towards people’s flow and ways of occupying spaces. And towards the programming of functions for, say, a courtyard or other space. This programming I don’t see as something that would currently fit the accessibility strategy. But in that way, accessibility comes to include more concepts and perspectives.”

Here, accessibility evolves from a focus on mobility and flow to encompass the overall qualities of the space. In other words, we should be careful not to box in different issues during the design process. This is a strength of universal design; it allows us to think about matters of for instance accessibility as something pertaining to all users and thus the entirety of a space – not just a specifically allocated part of the space, or a specific group of users. In summary, we can move from questioning: A) how to best solve issues with the use of as little space as possible, to B) questioning the premise for limiting the space required by a certain solution, to finally C) questioning what it would look like if we made the entire space at our disposal solve the issue in question. There can be a benefit to answering any and all of these questions. It will rarely make sense for a project to follow these

questions all the way from A to C, but we should be aware of the type of question we are currently working with in our design process.

INTEGRATION

A Narrow questions

- How can I/we integrate this solution as neatly in this space as possible?

B Semi-open questions

- For what reason do I/we require a special solution in the first place?

C Open questions

- Can I/we design this space in such a way that the solution itself becomes a quality for the space?

What are our social and ethical responsibilities?

Now that we have touched upon questions regarding regulatory and pragmatic concerns in the context of universal design, it seems prudent to discuss the ethical and social responsibilities implicit in universal design. Accessibility, for instance, can be framed as an example of professional responsibility for landscape architects:

“So, in that way, I think there is some kind of social responsibility that we try to live up to when making good outdoor spaces. I actually hadn’t thought about this in relation to accessibility (...). To me, that would have been about level free access and guidelines. But now that you broaden the concept to include social responsibility, I actually think that’s a big part of what we do, as a natural part of our work as landscape architects.”

Exploding the barriers that box in various aspects of our design practices is fundamental to universal design. Issues of accessibility, for instance, will affect everybody at one point. Even the strongest of us can benefit from easier access to spaces when carrying groceries,

when coming back from a ski trip with a broken leg, or any other of the dozens of examples of curve balls that life throws our way. Making things easier is ethically considerate and socially sustainable because it can significantly lower the barrier to everyday activities. The two previous quotes exemplify an awareness of how our work methods, and the questions we ask in employing such methods, box in certain topics. We should remember to ask, *‘who am I designing for right now?’* and *‘how are they represented in my practice?’*. Simple questions like these may prevent us from unintentionally designing spaces that primarily serve the needs of one particular group, such as adults of the same gender, size, and ableness as ourselves. Therefore these questions are always valid to ask, especially if interested in an inclusive design process (see Holmes & Maeda, 2018 for more on this). Of course, this should not dissuade us from raising even more the reflective bar of our questions:

“But... accessibility, what is accessibility? Is it about the purely physical access through a door opening, equal for all, or what kind of accessibility are we dealing with? If we can talk about it at a grander scale, then we could also talk ethics, somehow. I mean, who is it for? Is it for everyone? At all levels? Because this is also something that sparks motivational energy in solving different tasks.”

Questions such as *‘what do we mean when we speak of accessibility?’* seek more fundamental answers which pertain to the general approach of your office. Nonetheless, individual projects should continually force us to specify our answers to such general questions within the particular site context. In landscape architecture, the social context of the project forces us to reformulate standard answers (Tubridy, 2020).

In summary, this section has presented three ways of questioning the social and ethical responsibility of your project. One A) deals with the parts of a project’s existing design that should be considered

relevant for such responsibilities. Another B) deals with checking up on yourself during the design process to ensure you maintain awareness of what type of bodies/users you are implicitly envisioning in your design. The final type of questions C) are perhaps best suited for evaluating the design process of your practice between projects.

RESPONSIBILITIES

A Narrow questions

- What aspects of my/our project should be considered relevant for questions concerning social and ethical responsibility?

B Semi-open questions

- Who am I/are we imagining will occupy this space?

C Open questions

- What role should social and ethical responsibilities play in my/our practice?

What do we need to learn?

The entire point of asking questions is arguably to increase our awareness and knowledge. It seems apt then, to dedicate this last section about the experiences from practice to learning:

“I think this continuing evaluation of how things are used (...) it could be interesting to do more off it. I think, because of my own experiences and what we have spoken about, that even with the best intentions and all the money in the world, it's hard to find the right solution.”

The dilemma brought up here is as relevant for universal design as it is for any other aspect of landscape architecture. One way of moving beyond mere good intentions is to take a critical and structured look at the ongoing and past projects of the office. During design processes it could be beneficial to conduct professional supervision in order to ensure the technical aspects of a project, and in order to keep

track of whether the proposed design adheres to the client's ambitions for the project:

“We are very prone to follow a certain tradition within architecture and landscape architecture to just deliver a project, then have a one-year evaluation – but that is just a formality, which has to be done; once we also had a five-year evaluation – and then you move on to the next thing. Maybe you pass by on your bike with your kids or something. Or you have to go and show it to a few people. Otherwise, you don’t generally revisit a site and you don’t set aside resources to revisit projects to ask what went well and what went poorly. The evaluation or learning which you can achieve by going ‘Ouch! We forgot an elevator in this cinema’, or something like that, we don’t make use of that, which is something we should be a lot better at.”

Once the site has been handed over to the client and has begun to see use, Post-Occupancy Evaluations (POE) offer a structured way of learning from past projects. The POE refers back to the client's original intentions with the project and analyses if the site upholds these ambitions after it has been handed over to its users. If the ambitions are not met, design adjustments may be required. However, the POE can also result in new knowledge which can be employed in future projects (Stigsdotter & Sidenius, 2020). By employing a more structured analysis, and a more systematic revisiting, of past projects and then sharing these with peers, knowledge gaps might be overcome and inspiration for new design solutions in future projects sparked. This is important because, while a joint responsibility of everybody involved, it often falls to architects and landscape architects to connect loose ends and follow up on various demands and constraints in a project (Latour & Yaneva, 2008). This is one of

the most challenging aspects of practicing architecture, but it is also what provides architects with a unique capacity to change lives – and why (thoroughly) revisiting past projects is often beneficial:

“These are good ideas, and well spotted, but, as I said earlier, we are often faced by the fact that when we have to realise something and convert it into buildable projects, many of these good ideas get sidelined. I wish we were better at this as a profession. (...) Some studios have sufficient influence to try and get this conversation going. I also imagine that there are a lot of organisations out there who are interested in collaboration and cross-disciplinary exchange.”

The above emphasises the importance of constantly acquiring new knowledge as a landscape architect. There are multiple steps we can take to go about this. The first of these is related to what we learn internally through the office’s projects by A) continuously evaluating the design throughout the design process. The second focuses on B) what we learn from professional peers at other offices through knowledge sharing with them. Finally, the third option is to obtain knowledge by asking C) what other professions can contribute in terms of novel and different insights. These options, then, differ in terms of how readily available they are in everyday design processes, with the C option being the most time and resource consuming. As with the other sets of questions, C is not always better than A – cross-disciplinary knowledge sharing has great potential but also takes a lot of effort, which is why question C requires more preparation and time. Asking and answering question A, on the other hand, should be readily available to most offices with two or more people. However, question A’s biggest benefit, namely that its easy and quick to get operational answers, is also its biggest shortcoming in that the answers provided here will most likely not challenge you to view your project from a new perspective.

EVALUATION & LEARNING

A Narrow questions

- What do we need to evaluate?
- What do my colleagues think of this?

B Semi-open questions

- How can we evaluate our design practices?
- How do they do this at other landscape architectural offices, and what can we learn from their approach?

C Open questions

- How do we make use of our evaluations in future projects?
- What do researchers and other professions have to say about what I am/we are designing?

7.2 Questions in everyday design practices – when and what to ask?

Throughout this chapter we have presented you with three categories of questions. All of these have their place in design processes but common to them is also their attempt to move practices from a pragmatic and legalistic focus on accessibility towards the holistic approach of universal design. In other words, questions such as these can gradually open our design practices in order for our profession to become more inclusive of the many demands placed upon us. A critique of this chapter might be that it is not ambitious enough, as we at times explicitly state that the pragmatic concerns of some projects make it impossible to move all the way through the line of questions we have presented. Likewise, these questions are targeted towards landscape architects and architects, but could look very different when asked by other actors in the architectural industry. However, we want to maintain that one of the strengths of universal design is that it is not a radical critique of the existing expertise within the architectural professions – which is also why we have shaped this chapter around a line of questions.

Structuring a text around specific questions, rather than presenting a text which narrowly defines and decides the place of universal design in practice, places a high level of trust in the reader that they are able to adapt and use such questions to open up design processes for reflection. As landscape architects, we are not above critique. Indeed, some have pointed out that landscape architects are not always critical enough, for instance, about the types of and incentives for joining projects (Fleming, 2019). Accepting all types of work can mean risking your professional integrity. In the context of this chapter, we advise being hesitant about joining projects in which even the *narrow* questions presented above are unwelcome.

As testified by the many landscape architects that we have presented quotes from here, there is a general willingness amongst senior practitioners to continually learn and make a positive difference. In other words, it is important to not confuse the structural conditions of the landscape architectural profession with the ambitions of individual landscape architectural practices. In reality, both structural conditions and professional ambitions are continually present and intrinsically linked during design processes (Latour & Yaneva, 2008; Yaneva, 2005). This is also why we have presented our questions as a three-step ladder throughout this chapter: It would be naïve and counterproductive to simply suggest *wrong* and *right* questions to ask. Similarly, we have not attached each question to a specific stage in a project at which it would make best sense to ask them. Our ambition is that you ask them as early as possible in a project. However, as the expert on the particular project you are sitting on, it is up to you to know when to ask and how to answer these questions.

RULES

A Narrow questions

- What are the success criteria of the space I am/we are designing?
- How are the client's goals related to the projects' process and how are they related to the finished space?

B Semi-open questions

- What are the particular spatial and social context of the project that makes it stand out?
- How can I/we integrate regulatory demands with what gives quality to the space?

C Open questions

- What knowledge is required to understand the purpose of regulations in our spatial context?
- Are specific regulations adversely affecting the purpose for which they were created?

INTEGRATION

A Narrow questions

- How can I/we integrate this solution as neatly in this space as possible?

B Semi-open questions

- For what reason do I/we require a special solution in the first place?

C Open questions

- Can I/we design this space in such a way that the solution itself becomes a quality for the space?

RESPONSIBILITIES

A Narrow questions

- What aspects of my/our project should be considered relevant for questions concerning social and ethical responsibility?

B Semi-open questions

- Who am I/are we imagining will occupy this space?

C Open questions

- What role should social and ethical responsibilities play in my/our practice?

EVALUATION & LEARNING

A Narrow questions

- What do we need to evaluate?
- What do my colleagues think of this?

B Semi-open questions

- How can we evaluate our design practices?
- How do they do this at other landscape architectural offices, and what can we learn from their approach?

C Open questions

- How do we make use of our evaluations in future projects?
- What do researchers and other professions have to say about what I am/we are designing?

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8.0

Norm criticism and norm creativity as a starting point for a more inclusive view of humanity

Emil Falster and Leif Hemming Pedersen

Introduction

In this chapter, we explore how the concept of universal design and Axel Honneth's theory of recognition can serve as a norm-critical and norm-creative starting point for a more inclusive view of humanity in pedagogical and social work. We start by arguing theoretically that the normative set of values in universal design is compatible with the "*justified normativity*" in Honneth's theory of recognition (Honneth, 2006), which in pedagogical and social work can be realised by professionals working towards a more norm-critical and norm-creative practice. This practice involves critically and creatively challenging and breaking with norms that can act as barriers to recognition and inclusion. We then specify how we understand norms and breaking with norms, after which we discuss how professionals can work in a norm-critical and norm-creative way by challenging inequality-creating norms in practice. To this end, we examine three empirical examples – partly from pedagogical practice in a special day care centre for disabled children, and partly from young people's accounts of their experiences with social work in their municipalities. The empirical examples are drawn from a PhD thesis on disabled children and young people and the barriers that appear in their everyday lives, from the perspective of the children and young people themselves (Falster, 2021). The examples aim to illustrate how professionals can challenge inequality-creating bodily norms in practice and for instance promote inclusion of children in communities of play or legal equality for young people without a verbal language in social case management.

8.1 Axel Honneth's theory of recognition and the set of values in universal design

The opening chapter of the anthology explains what universal design entails in terms of values and (design) principles. In this chapter, we argue that these values and principles are consistent with the

normative basis of Honneth's theory of recognition. In other words: If universal design is set as an objective and a guideline for the design of social, physical, technological and societal settings and arenas, then recognition theory is the normative, social-philosophical answer as to why. We thus attempt to offer a theoretical anchoring of universal design, but at the same time move towards universal design in practice, by showing how the principles of universal design (see Chapter 1) can be realised in pedagogical and social work through a norm-critical and norm-creative practice. In this section, we begin by elucidating what we mean by *anchoring* universal design theoretically in the theory of recognition.

We understand a theoretical anchoring of universal design as the process of making explicit the normative view of human beings and society that grounds (or should ground) more specific (design) values in universal design, as formulated by for example Steinfeld and Maisel (2012) (see Chapter 1). We argue in this chapter that recognition theory's ideas of human freedom and the good life provide the reason for why universal design should be an objective and a guideline in societal developments. Likewise, we believe that the social-philosophical assumptions of recognition theory are best suited to describe the view of humanity and society that universal design already implicitly includes. In other words, we point out that the implicit understanding of people and society in universal design is much the same as in most social theories of recognition, which, in turn, explicate this understanding and the potential to change society accordingly.

Researchers such as Inger Marie Lid (2014, 2020) have already done a lot of work to explicate the view of humanity and society in the concept of universal design and linked it to, for example, relational models of disability, but we still believe that the following point by D'souza (2004: 3) describes large parts of both the research and academic literature on universal design:

"Given the popularity, Universal design still remains largely atheoretical i.e. the researches of Universal design do not explicitly affiliate themselves to any form of theoretical

paradigm (...) In this sense, Universal design can come under functionalist paradigms (because it caters to utility), pragmatic (because it is instrumental in nature), positivistic (because it strives for universal principles), normative (because it prescribes certain rules) and critical theorist paradigms (because it gives voice to the oppressed).”

Thus, although it can be pointed out (the effort holds a certain irony) that universal design as a concept and approach does in fact live up to its own ideals of accessibility and usability, it is not without significance which theoretical premises we use to argue the case for universal design. As D’souza points out, the idea of universality, for example, often gives rise to a positivist mindset where the principles of universal design are seen as stable, timeless and value-neutral. However, universal design entails a number of normative claims and ideals, which are also reflected in its strong alignment with the UN Convention on the Rights of Persons with Disabilities, and which must simultaneously be realised in a wide range of contexts where different social circumstances present different barriers to participation and inclusion. Universal design thus involves a particular view of humanity, an interpretation of society and ideals of freedom and the good life, which both practitioners and theorists of universal design must be able to articulate, but which require a justified theoretical framework.

In line with D’souza, we find that universal design aligns with critical theory. However, in contrast to D’souza’s broad approach to this argument and general outline of critical theory, we start from a *specific* critical theory, namely Honneth’s theory of recognition (2006), which deals exactly with the question of how the norms and frameworks of a given society should be changed as a result of demands and struggles for recognition. The theory has been applied and discussed across a wide range of academic fields and disciplines, including pedagogy and social work (Falster, Vagtholm & Warming,

2022). As a so-called grand theory, Honneth attempts to explain a number of general dynamics of society and identity formation. The basic assumption is that people create their identity intersubjectively and socially. This contrasts with other theories of society, such as social contract theories, which are based on a view of humanity where the individual subject is seen as atomistic and engaged in a battle for self-preservation against all others, and where a social contract is therefore necessary to ensure that the individual's endeavours to achieve their goals and freedom do not restrict the freedom of others. The theory of recognition, on the other hand, points out another kind of struggle for self-realisation and social formation and change, namely the struggle for recognition.

According to Honneth, people need different forms of recognition from others, and from society at large, to build and maintain their identities. Briefly explained, Honneth identifies three forms of recognition: One form is love (or care), which (ideally) we experience throughout our lives in our primary relationships, giving us a fundamental sense of self-confidence. Another form is respect, where we are recognised as autonomous and equal individuals by other people and by society through laws and rights, thus ensuring fundamental self-respect. Finally, there is a third form of recognition, which Honneth calls solidarity (or esteem), which involves the recognition of our uniqueness and difference from others as well as our contributions to large or small communities, which in turn contributes to our own sense of self-esteem.

However, many individuals and groups often find that their bodies, sexuality, lifestyles or identity positions, etc. are not recognised or may even be discriminated against and disrespected due to existing norms and different levels of (power) hierarchies. These feelings and experiences of being excluded, stigmatised, treated unfairly or outright violated give rise to demands and struggles for recognition. For the individual, this can be on a daily basis, but Giles (2020) finds that Honneth focuses mostly on the (historical) cases where larger groups of people who share experiences of being subject to disrespect struggle in an organised way for social change (struggles centred around economic redistribution, women's and civil rights, etc.).

Honneth considers his theory to be a critical social theory that not only describes but also normatively supports a wide range of recognition struggles. Although the theory somewhat fails to clarify which struggles for recognition are morally legitimate (Honneth is, for example, critical of nationalism), he finds that historical struggles for recognition ensure better societies in the long run, when more people experience inclusion and room for new identities and self-understandings (Honneth, 2006).

The basic premise of recognition theory – that discrimination occurs in relationships with others and with society (Honneth, 2006) – is also a defining aspect of universal design. This is also the main point of social and relational models of disability (Oliver & Barnes, 2012), which distinguish between impairment and disability (i.e. the limitations and barriers that arise in the encounter between a person with impairment and their social and physical environment). This premise of inter-subjectivity and the human being as a social animal is the ontological common denominator of recognition theory and universal design. This also extends to a shared normative position that argues that societies should strive for care, respect and solidarity for all. This is also why the idea of universality resonates with a recognition theoretical perspective.

However, as highlighted above, it is important to emphasise that this should not be understood in positivistic terms. What care, respect and solidarity (should) imply differs from society to society and from era to era. In a way, this is also included in the (design) principles of universal design, such as cultural appropriateness (Steinfeld & Maisel, 2012), and an epistemological starting point thus emerges: Despite an ideal of recognition (which may be *universalised* in for example the UN Convention on the Rights of Persons with Disabilities), the construction and design of everything from buildings to social practices cannot start from a checklist approach with predefined solutions. The content of what constitutes recognition (ensuring self-confidence, self-respect and self-esteem) needs to be formulated by the use of (research) methods and approaches that include people's feelings, attitudes, experiences and (everyday) practices in their diversity and context.

From a design perspective, this points to universal design's sister concept: *inclusive design*, but without descending into a methodological individualism (cf. Mackenzie, 2019) which – although it might address the needs of particular individuals in questions of (technological) accessibility and usability – does not necessarily take into account the above-mentioned premise that recognition and disrespect are socially constructed and therefore must be addressed at the social level, too. The 'social' must therefore be explored and considered in design processes.

Therefore, a certain tension exists between the (universal) idea of the good life that is shared by recognition theory and the concept of universal design and, on the other hand, specific (cultural) contexts. Is it possible to respect existing norms and values about what can and should be recognised in a specific society, and at the same time support the change or toppling of norms that restrict and discriminate against certain individuals and groups in the same society? Is it possible to recognise/design for everyone? This question has been posed in relation to both recognition theory and universal design, and we believe that an important step towards addressing these and related questions is to open up the toolbox of norm criticism and norm creativity, which we will do in the following sections.

8.2 Norms and breaking with them

Norms can be seen as the unwritten and self-evident rules and social values that indicate what is expected in a given social context. In other words, the invisible rules and values that regulate and frame people's self-presentation, social interaction and relationships with each other (Jacobsen, 2011). For example, there are norms relating to sexuality, gender, bodies, or social norms on how we should act around each other. Norms are often so invisible and taken for granted that people do not reflect on them or pay attention to their existence or effect in everyday life. Many of them only become evident when a norm is breached (Falster, Vagtholm & Warming, 2022).

Such an infringement can include a person or group breaking or challenging a norm. Examples include a homosexual couple challenging heterosexual relationship norms, a transgender person challenging gender norms, or a child with a visible impairment challenging body norms. As Clarup, Hamilton & Padovan-Özdemir (2020: 5) emphasise, norms create an order that defines “(...) *which possible actions, experiences and developments are legitimate or illegitimate* (...)”. For example, the three examples above involve people/groups that challenge or break with the heteronormative, cis-normative or body-normative order in society. This also means that a person or group that breaks with or challenges a norm will (involuntarily) attract attention from their peers and social environment. This can be expressed by others staring at them, asking inappropriate and unacceptable questions, or systematically avoiding or excluding the person or group. Based on the theory of recognition, a break with a norm can thus become a medium for discrimination and a barrier to recognition and inclusion. This is often the result of the fact that norms create a social construction of a centre and a periphery (Clarup, Hamilton & Padovan-Özdemir, 2020: 5).

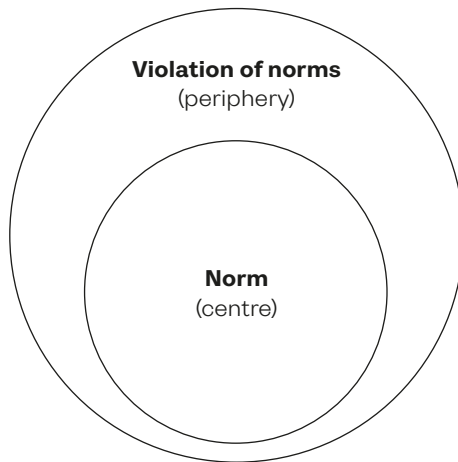


Figure 8.1: Norms and breaking with them

The centre may include individuals and groups who do not challenge or break with one or more norms, but who generally adopt ways of thinking and acting that are perceived and assessed by the majority as falling within the centre of the *norm*, that is, the *normal* or *natural*. Conversely, the periphery can include individuals and groups who challenge or break one or more norms and who are perceived and judged by the majority as *strange*, *deviant*, *abnormal*, *sick* or *unnatural*, etc. Norms thus create mechanisms of both inclusion and exclusion, as well as inside and outside positions in society (Goffman, 2009; Becker, 2005), and, according to Honneth (2012, chapter 12), the need for recognition is exactly the fundamental driving force behind the emergence of (subcultural) groups and communities. However, the construction of inside and outside positions also implies that certain norms produce and reproduce a structurally unequal distribution of power and privilege between members of society (Falster, Vagtholm & Warming, 2022). The distinction between a centre and a periphery is of course a theoretical one, as norms can also be in a state of flux, change or merge, e.g. based on demands or struggles for recognition, and so can be difficult to separate in practice. In other contexts, the distinction between a centre and a periphery may be clear and obvious, if the differences are observable and measurable. Observable and measurable differences have been a prerequisite for constructing the categories normal/abnormal (probable/unprobable), a widespread and applied distinction in modern science (Foucault, 2019), which is expressed by for example the mathematical normal distribution curve in medical research and practice, as well as in developmental psychological tests for children (Falster, 2019; Falster & Warming, 2019). Throughout history, the notion that people, and social reality as a whole, can be categorised into normal and abnormal has become a hegemonic cultural discourse that has in various ways shaped, and continues to shape, our understanding of particular groups, positions and social reality (Hacking, 1990; Jenkins, 2006: 195).

8.3 Thinking and working in a norm-critical and norm-creative way

When the social construction of a normative centre and a norm-breaking periphery becomes a barrier to recognition and inclusion and instead results in discrimination and exclusion, it is often because people have not learnt to critically engage with oppressive and inequality-creating norms in society. In other words, we have not learnt to think in a norm-critical and norm-creative way. *Norm-critical thinking* means thinking critically about the norms that are taken for granted and perceived as self-evident, normal or natural. As Clarup, Hamilton & Padovan-Özdemir (2020: 5) emphasise, this does not mean that norm-critical thinking entails or aims to create a normless society. Rather, it is about challenging and breaking the norms that can act as barriers to recognition and inclusion in various ways, and that have an exclusionary and discriminatory effect, e.g. by ostracising certain groups and making them feel wrong/different.

With a starting point in norm-critical thinking, it becomes possible to work in a *norm-creative* way. This involves working creatively to challenge norms that create an unequal distribution of power and privilege, e.g. in the form of unequal opportunities for participation (Salmson & Ivarsson, 2015). As is indirectly apparent from the above, thinking and working in a norm-creative way is based on a number of minimum conditions, where the professionals who are for instance part of a pedagogical or social work practice and context, legally recognise and are in solidarity with the individuals and groups who challenge the norm. This means that professionals recognise the legal equality of the person or group and are in solidarity with the particularity of the individual and/or group and their distinctive contribution to the specific and general (societal) community. According to Heidegren, this implies more than the recognition of abstract rights, namely that members of society (in this case professionals): “(...) *affirm, encourage, appreciate and are generally open to other people with different life patterns*” (2010: 37). The conditions for working in a norm-creative way therefore imply that, as a minimum, professionals are open, curious and appreciative of

other (alternative) ways of thinking and acting, including forms of expression and appearance as expressed, for example, through bodily variations, sexual orientations, gender identities and expressions. As Clarup, Hamilton & Padovan-Özdemir (2020: 5) emphasise, such a normative approach and practice requires professionals to be conscious and reflective about how they themselves (unconsciously) reproduce norms, and at the same time to actively consider the fact that – when they work in a norm-critical and norm-creative way – they themselves are also co-producers of new norms. The difference, however, is that the new norms should create a more equal distribution of recognition, inclusion and participation opportunities.

So how can the values of universal design and the theory of recognition be practised through norm-critical thinking and norm creativity in practice? In the following section, we will present three empirical examples from a PhD thesis (Falster, 2021), where each example partly relates to a specific sphere of recognition (respectively: care, respect, and solidarity) and partly illustrates how different norms can create inequality, but where it is also potentially possible to change these through a norm-critical and norm-creative practice. The three examples are: 1) a field note about inclusive play in a day care centre, 2) a quote about the experience of cooperation with the municipality and 3) an observation/field note about how body norms create a basis for exclusion in a day care centre. The empirical data were collected in connection with fieldwork and observation in a day care centre and an educational programme for disabled children and young people.

Example 1: Inclusive play

Asger, a 5-year-old boy with autism, often struggles to understand the unwritten rules of play when playing with the other children in his group. This often leads to conflict and him being excluded from play by the other children. Every day, the staff therefore initiate a more

adult-led form of play, where the children who want to participate sit in a circle. In the centre of the circle, an electric train runs back and forth and the children take turns putting toys on the train. The rules of the game are simple and transparent, allowing Asger to participate and to realise that he can play with the other children.

The above field note illustrates how social norms and unwritten rules on *how to play* risk excluding children who struggle to decode these norms and unwritten rules. This group of children is at risk of being excluded by their peers, thereby losing the experience of being able to engage in play, relationships and communities with other children. In other words, they are excluded from the care and recognition that also exists in friendly relationships and which, according to Honneth (2006), is one of the prerequisites for developing self-confidence. It also exemplifies that even if Asger is not physically excluded, he is still excluded in a social sense: He has access to the space (in this case a room in a day care centre), but he does not have access to one of the main activities (playing with others) that the majority of other children have the opportunity to participate in (Ryhl, Eiriksson & Overby, 2021). However, the staff actively consider the fact that some children are not neurotypical/able-bodied and therefore may find it harder to decode and comply with social norms and unwritten rules for play. Instead of individualising the exclusion with reference to Asger having to learn to understand the unwritten rules, the staff initiate an adult-led play where Asger and the other children have the opportunity to be stimulated, experience care and participate in play where the rules are simple and transparent, and by extension experience that they can also play with others and form friendships. This *design* of a play situation is an example of universal design. The example illustrates how staff can use simple norm-creative approaches to address the fact that social norms and unwritten rules for play intertwine with able-bodied and neurotypical norms for individual and social competence, which in this case implies that, as a child or adult, you must demonstrate the competence to read

social situations and unwritten rules for behaviour and interact with other people in a certain way. However, the staff put this temporarily on hold when they also initiate games where the rules are simple and transparent for all children. *Designing* play situations in an inclusive way can also include a material component, e.g. by ensuring toys are not placed where disabled children cannot access them (unless there is a reason for this), or by the individual institution taking a norm-critical and norm-creative approach to the spaces and material objects that are part of the children's everyday lives. This can be realised by for example creating spaces, playgrounds and other physical environments according to the design principles of universal design, or by purchasing toys designed for disabled children that in principle can be used by all. In other words, it is about professionals being aware of their own (able-bodied) position and thus potential blind spots, and how both social/relational and material conditions can lead to inclusion and exclusion in everyday life.

Example 2: Perception of co-operating with the municipality

"There were major problems with the municipality from the start. I speak through my word board or iPad and my mum helps me write, but because she does this, the municipality thought she was writing things for me. It was only after they had accepted my way of speaking that I could even be allowed to answer for myself – that I was allowed to be involved at all."

The above quote comes from a 16-year-old girl, Kristina, who was asked about her experience of co-operation with her municipality. Kristina communicates in writing using a word board or iPad, with

her mum helping her to move her fingers. However, this is a form of communication that her municipality did not initially accept, which is why she was not involved in her own case. This is an example of how body-normative understandings and conceptions of the human being as an independent, autonomous, and able-bodied subject who can speak and write for themselves create a specific framework in which specific forms of communication are accepted as legitimate. From a recognition-theoretical perspective, this results in Kristina not being treated equally to others, which risks undermining her ability to develop self-respect.

Instead of excluding Kristina, the situation could give rise to norm-critical thinking by asking the question: How do we enable and ensure participation when the citizen does not (or can only partially) communicate verbally? In this context, norm-creative work could include using picture cards that express certain feelings/moods or a list of response and/or satisfaction categories that Kristina could point to in order to express her experiences and assessments. Following the universal design principle that diversity in needs requires diversity in solutions (Ryhl, Eiriksson & Overby, 2021) lays the foundation for citizens who do not communicate verbally to experience recognition through legal equality, letting them practise their right to offer their perspectives on what constitutes meaningful help and support for them in a similar way to able-bodied people.

Example 3: Body norms as a basis for exclusion

After lunch, I sit in one of the group rooms to observe. Two boys start playing with a pair of fireman's hats. Two other boys come running into the room and approach the others. 'Why don't we play cops and robbers?' one of them shouts, and the other three shout 'Yes!' One of the boys, who cannot walk, shouts that he wants to be a policeman. He is eager and seems to be keen to take on

the role. However, one of the others interrupts him and says: 'policemen need to be able to walk and run'. The boy who cannot walk looks disappointed. A few seconds later, he crawls under a table. He seems to be upset. The other boys start running after each other.

As the observation shows, this is a play situation where a child is excluded. The reason for the exclusion stems from a body normative understanding and notion that police officers are always able-bodied and therefore need to be able to run and walk. The children in this group therefore have an understanding and idea that only those who are able-bodied can fulfil certain roles in play. Based on the theory of recognition, this type of exclusion can be interpreted as a devaluation of the child's contribution to play, since, according to the other children, he is unable to comply with the norms and requirements of the role of a police officer. This risks undermining the boy's ability to develop self-esteem, where on the other hand, through solidarity, he can experience that his unique contribution to the play community is recognised as something that makes a positive difference to the other children, to the game and to their specific community. It is in these situations that professionals can take a norm-critical and norm-creative approach in a way that makes a direct difference to the children who experience exclusion based on body norms, but which could also arise from other inequality-creating norms. In this case, staff can ask norm-challenging questions such as: What about the police officers who ride motorcycles? What about the officers investigating the case? Or a prison officer/guard? In other words, the staff can intervene in play in a way where they ask norm-critical questions of the children, which can support the individual child, as well as the group, in thinking and acting in a norm-critical and norm-creative way in other contexts, but which also creates better conditions for inclusion in the current game. It is also possible to use material objects to support inclusion. In the above example, the boy who is excluded from the game can in fact move relatively quickly on a toy motorcycle and thus participate in the game in the role of

a police officer on a motorcycle. However, neither the boy nor the other children are aware of this possibility – and here the professionals could, for example, challenge them by asking norm-critical questions and directing them to use material objects that can make play more inclusive.

At the same day care centre, the staff and children have made a rule that they (both staff and children) wait for each other. This rule is based on the fact that there are some children in the day care centre who are unable to walk. The rule is therefore designed to show solidarity with this group of children, but applies to all children, so it does not focus attention on those who cannot walk. At the same time, and in the same way as the norm-critical questions, it is also a specific example of the fact that even though professionals may engage in norm criticism, they are still co-creators of new norms – in this case a norm that, from the normative basis of universal design and the theory of recognition, is more inclusive and solidary, as the rule creates awareness that people have varying functional abilities.

8.4 Discussion and conclusion

Professionals in pedagogical and social work are also designers – not of specific material and technological products directly, but of the relational work they practise with citizens, such as disabled children and young people. In the same way that body norms influence how we build and organise ourselves, they, along with many other norms, also influence how we interact with each other and enter into relationships. In this chapter, we have discussed how universal design and the theory of recognition can, in harmony, constitute a normative starting point for pedagogical and social work with a view to practising relational work in a norm-critical and norm-creative way that challenges inequality-creating norms. Overall, there is an inherent dialectic in universal design and the theory of recognition: on the one hand, they can provide the normative basis and theoretical justification for professional work, while on the other hand, they

point to future outcomes, in the form of a more equitable distribution of recognition, participation and inclusion. As a starting point for norm-critical and norm-creative work, both recognition theory and universal design can initiate reflection and generate awareness of how to create better conditions for recognition and inclusion, through an increased awareness that diversity in human needs requires diversity in, for example, relational work (Ryhl, Eiriksson & Overby, 2021). In terms of the latter dialectical aspect, the theory of recognition and universal design can act as a continuous guideline, because a justified normative standpoint makes future outcomes for pedagogical and social work transparent. In future, norm-critical and norm-creative solutions and ways of thinking in pedagogical and social work can thus be interpreted, justified and, not least, articulated as practices in universal design with the ideal of supporting conditions for mutual recognition between professionals and users/citizens, between adults and children/young people, etc. This articulation and clarification based on actual practice and social reality can thus help to strengthen the theoretical understanding of what constitutes respectful and inclusive practice.

In addition to this perhaps traditional dialectic between theory and practice – which we believe can be reinterpreted with a terminology where universal design is understood as the ideal and guideline; *recognition* as the normative and theoretical justification; and *norm criticism and creativity* as the practical tools – we would also like to add a final perspective: The social-philosophical normativity of recognition theory and the values of universal design, which together constitute an idea of social justice, can also serve as ballast in arguments on why (economic) *resources* must be prioritised for norm-critical and norm-creative practices in social and pedagogical work that support and design the conditions for people in interaction to experience differentiated recognition in the form of care, respect and solidarity, which is a prerequisite for realising collective as well as individual freedom.

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9.0

Pedagogical tools for teaching universal design

**Dagný Valgeirsdóttir, John Paulin Hansen
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Introduction

How do we support social sustainability and inclusion through innovation and design? And how do we teach students to do so and increase their understanding of universal design? DTU has developed an answer to this challenge: A Universal Design Playbook to support the planning and execution of design processes and co-creative activities. In this chapter, we describe the Universal Design Playbook itself and our first experiences of using it in teaching.

9.1 Inclusive design

Designing for inclusion involves a process of optimising products, services or environments to meet the needs of as many people as possible. The design is often based on the challenges, needs or opportunities of a specific and marginalised group (Clarkson et al., 2013). Experience has shown that designing for people with special needs often generates solutions that benefit the wider community. For example, kerbside ramps are essential for wheelchair users, but also useful for those who have to navigate a kerb with a pram or hand trolley. The overarching principle of universal design is defined as “*designing products and environments so that they can be used by all people, to the greatest extent possible, without the need for adaptation or specialised design*” (Mace, 1998).

The terms *inclusive design* and *universal design* are often used interchangeably. While the concept of universal design has its roots in architecture, *inclusive design* is the most commonly used concept in digital environments.

A key element in designing universal solutions is empathy – empathising with users and their perspectives. However, it is not always enough for designers to rely solely on their own personal experience as a basis for their empathy; they may misinterpret users’ needs (Smeenk et al., 2019). The designers act as facilitators and must have

an open and engaged mindset combined with good observational and collaboration skills (Mattelmäki, 2008).

In empathic design, professionals and users co-operate on an equal footing (Dorst, 2010). The principles are applied in a wide range of industrial, creative and social contexts. One of the concrete activities that often comes into play in design thinking is user involvement, where users and other relevant parties are invited to participate in the design process (Pralhad & Ramaswamy, 2004; Sanders & Stappers, 2008; Valgeirsdottir & Onarheim, 2017).

9.2 Design processes included in university programmes

Some university students work in groups to develop specific solutions to challenges with technologies, services or concepts. End users – whether customers, citizens, patients or the public – are sometimes *forgotten*. This is particularly true in the case of users with special needs beyond those recognised by the students themselves. DTU has therefore developed a pedagogical tool to capture users' perspectives. The ambition is for the Universal Design mindset to be embedded through application of the Universal Design Playbook methodology, and that the approaches learnt by the students will have a lasting impact on the quality of their designs later in their professional careers. For example, a service may be improved for *all* citizens and become easier to administer for the authorities because there are fewer cases where a citizen requires special services or cannot be helped. A product is more likely to succeed on the market when customers with special needs also buy it because they can actually use it. This can be seen as significant in our part of the world where, thankfully, an increasing proportion of the population can look forward to a longer life. However, longer life expectancy also brings with it a number of motor and cognitive challenges.

Dissemination of the Universal Design Playbook – body and movement as an example

As a pedagogical-didactic approach and concrete planning tool, the Universal Design Playbook is expected to be applicable in educational contexts beyond the field in which it has been tested thus far. In recent years, well-known dynamic teaching methods such as inquiry, experimentation, project work and problem-based learning have been complemented by formats focusing on design and co-creation in several university programmes. For example, this applies to the body, movement and physical activity programmes in Sports and Health Science at the University of Southern Denmark. They are already using learning approaches similar to those expressed in the Universal Design Playbook. These are based on the core principles of activating teaching and active learning. The Bachelor's and Master's programmes are organised to provide good opportunities for feedback between teachers and students, as well as a high level of student activity with the possibility of individual differentiation. The ambition is to produce graduates with strong theoretical and practical competences to promote active living. This ambition is supported by teaching elements that enhance the students' competences in designing innovative processes and concepts linked to communication and learning in sport, as well as initiating, analysing and assessing the development of products and services relevant to a broad area of physical activity. Aspects related to universal design are particularly evident in the parts of the programme that develop students' competences to adapt physical activity, training and sport to different target groups – including people with different types of impairments. The assumptions are that everyone has the right to participate in leisure and sporting activities and that people have different preconditions and motivations for movement and activity. Inclusion and differentiation are key guiding principles.

One tool that the Universal Playbook is intended to support is educational programmes that aim to develop students who, in collaboration with other disciplines and an often wide range of stakeholders, acquire skills in analysing and acting in a qualified manner on professional issues within their field of expertise. The interactive

format with a strong emphasis on the inclusion aspect supports the entire programme's mission to produce graduates who can undertake interdisciplinary as well as specialised dissemination, analysis, development, planning and research tasks. In this context, we believe it makes sense to include tools to enhance skills in developing solutions for broad user groups and – more fundamentally – to support graduates to feel confident and comfortable in using design methods to identify, develop and assess inclusive solutions.

9.3 Universal Design Playbook

The Universal Design Playbook is an online tool (www.universal-designguide.com) that helps coordinate a plan for carrying out design activities. While it is advantageous if users have experience in using design methods, it is not a requirement. However, it is important that those using the Playbook are aware of what stage of the design process their project is in. Is it in the initial phase, when empathy and exploratory methods are relevant, or in the later phases, when summarising methods are needed?

There are several online toolkits that give suggestions for choosing design methods, such as servicedesigntools.org and the University of Copenhagen's online resource (<https://innovationenglish.sites.ku.dk/metoder/>). What is novel about the Universal Design Playbook is that it has a strong focus on the inclusion of users with special needs and that it provides a customised plan for running a design workshop, with all the necessary information students need in one place. The Universal Design Playbook ensures a unique focus on users with special needs by requiring students who are planning design activities to consider what competences they have assumed in the participants and whether those assumptions could prevent some from being active during all activities. Participants in the development projects with user participation may have different abilities or disabilities, which may be visible, such as motor disabilities, or invisible, such as cognitive or sensory challenges. The playbook

also provides detailed suggestions of how best to accommodate user-participants with different types of disabilities.

Within the inclusive design tradition, it is common to work with fictional users and their experiences of design solutions – known as *personas* – to whom special needs are attributed (Coleman et al., 2016). As an alternative to this method, DTU has developed a deck of cards called *Ability Prompt Cards*, which are used during a design process to challenge the ideas being worked on (see Figure 9.1). The cards aim to promote an understanding of user perspectives and encourage design solutions to be extended to the widest possible user group. There are 16 cards in the deck, each representing an ability, such as gripping an object, and three levels of how persistently this ability may be challenged, either permanently (indicated in bold); for a period of time; or only in a specific situation. The cards, which can be printed and distributed to all participants, can then be *played* against an idea, with the designers discussing whether this particular idea is suitable for people who are, for instance, in a situation where their cognitive abilities are challenged. The designers may agree that the idea is not suitable for the given situation. It therefore becomes a conscious decision to disregard that user group or not to support the solution being used in the given circumstances. Once the matter is clarified, the next step is to ask ‘*why not?*’. We call this method *dropping bias*.

The cards can also be used to set obstacles for design solutions, for instance that people with only one arm *must be able* to use them. Obstacles have been shown to increase creativity (Onarheim and Valgeirsdottir, 2017). Therefore, we expect the challenges that the cards represent to promote innovation. Finally, the cards can be used for systematic evaluation, for each of the cards, recording the extent to which a particular capability is a prerequisite for the use of a given design solution.

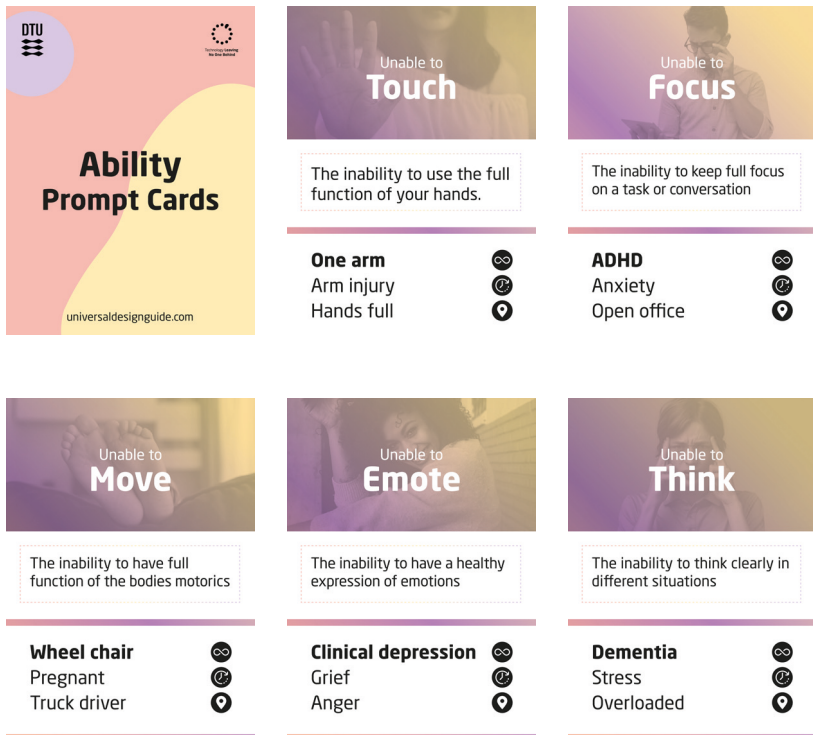


Figure 9.1: Examples of 5 out of 16 cards to expose ability assumptions in design solutions.

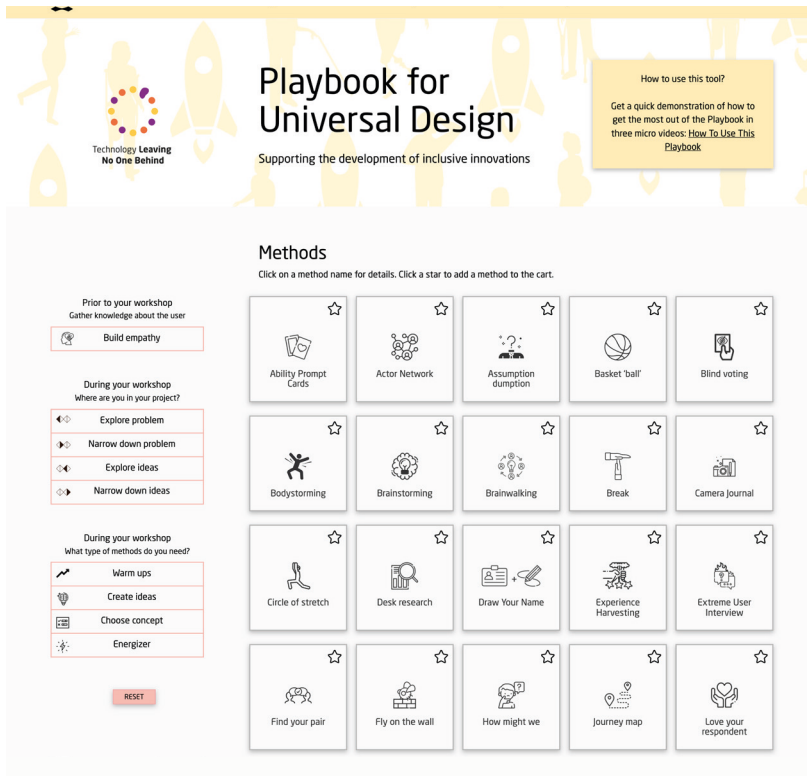


Figure 9.2: The front page of the Universal Design Playbook web service (www.universaldesignguide.com)

Design researchers have long held a particular interest in stimulating cognitive strategies during the development process. Here, a distinction is made between divergent and convergent forms of thinking, with the former characterised by opening, expanding and uncovering, while convergent thinking is used to narrow, sort and prioritise (Guilford, 1968). Basadur et al. (1982) have suggested that these two modes of thought take turns to be dominant across three phases: 1) problem identification, 2) problem solving and 3) solution implementation. The model has subsequently been extended to include a fourth phase in the widely used *Double Diamond Model*, which emphasises that both the problem and solution phases have

divergent and convergent periods (Design Council, 2005). The double diamond model is used throughout the Universal Design Playbook to structure a creative development process, as can be seen in Figure 9.2, where the selection of appropriate methods should indicate whether it is relevant to explore a problem, narrow down a problem, explore ideas or narrow down ideas.

The Universal Design Playbook contains more than 40 design methods, including traditional approaches and some specifically aimed at developing inclusive solutions. The Universal Design Playbook has three sorting functions to identify the most suitable methods.

Figure 9.3: Presentation of the Ability Prompt Cards method in the Universal Design Playbook, where the cards can also be downloaded for printing.

– *Empathy*. This sorting function will lead the user to methods that they can use before beginning the actual design process. This is in order to understand the intended user groups and the challenges and opportunities they may face. This function is particularly important when the aim is to develop universal design.

- *Where are you in the process?* As described above, this sorting function is based on the Double Diamond model and is useful when, for instance, planning a workshop.
- *What type of methods do you need?* This sorting function helps to select methods in the context of a workshop, finding methods that are specifically suitable for preparation, generating ideas or choosing a final concept.

In addition to the methodology collection, the Universal Design Playbook offers guides, information material for both educational and inspirational purposes, as well as support to develop a timetable for a workshop process. Each method is explained with a video and step-by-step instructions, a tutorial, template and, most importantly, tips for creating inclusive solutions (see Figure 9.3).

As can be seen in Figure 9.3, the methodological descriptions include reminders (bottom right) to consider who the participants are, as well as guidance on how to accommodate participants if they are challenged by various functional limitations. Finally, it also indicates what input is required, what output the method produces, how cognitively demanding the method is considered to be, how long it takes, how many participants it is suitable for and what activities it involves. Once users of the Universal Design Playbook have chosen the methods they want to use, the digital tool creates a comprehensive workshop plan – including method descriptions, templates and facilitation tips. Everything can be downloaded as a PDF file.

9.4 Testing the Universal Design Playbook

The first prototype of the Universal Design Playbook was tested in co-operation with Muskelsvindfonden (The Muscular Dystrophy Foundation) at a workshop aimed at developing accessible seating at music festivals (image 9.4). The workshop took place in March 2021 in the form of a user test of the interfaces on the Universal Design Playbook website. Fifteen participants were divided into three

groups and were given the opportunity to gain insight into the problem area via input from end-users of spectator seating at festivals, who participated online (see image 9.4). Participants conducted user interviews with support from advice embedded in the Universal Design Playbook. From these interviews, the participants and end-users were together able to construct a typical sequence of events when wheelchair users go to music festivals. The *user journey* approach is one of the methods that the Universal Design Playbook offers guidance on. The purpose of describing a user journey is to map in detail how users interact with a service or product over time. Against this background, the most likely experiences that different people are expected to have can be further analysed. The individual parts can then be categorised to gain an overview of the situations that may arise.

The final result was presented to the Muscular Dystrophy Foundation at the end of the workshop, as an overview of the users' reflections on the need for a more inclusive solution.

The workshop had the dual purpose of both mapping the problem from the users' perspective and testing the usability of the Universal Design Playbook webpage. The comments from participants were overwhelmingly positive:

“There was a lot of introductory information to work through, but the exercises were really well documented and the videos were good. I loved the way the double diamond was used to sort the exercises.”

“I really liked the way that the inclusion mindset provides a constant reminder during the implementation of each method.”

“The Playbook is very good at focusing on the abilities and disabilities of the users – both with the Ability Prompt Cards and with advice on how to adapt the exercises to participants with disabilities.”



Image 9.4: Students test an early version of the Universal Design Playbook with young people with motor disabilities who contributed their experiences online.

9.5 User involvement at course level

User involvement is also a fundamental part of the *Staging Co-creation and Creativity* course at DTU. During the course, students are trained to organise and run co-creation workshops, where a key objective is to learn how to accommodate external participants or users. Halfway through the semester, people with disabilities are invited to participate in workshops hosted and facilitated by students. In autumn 2021, eight people took part in two workshops of 90 minutes each. One week before the workshop was organised, students were informed which user they would be working with. The process was very successful and the feedback from both users and students was extremely positive. However, the students wished they had had the opportunity to work even more closely with the users, because the co-creation perspective gave them useful insights and increased their empathy in a crucial way.

TEAM ONBOARDING	EXPLORE & ANALYZE	DEFINE & CHOOSE	IDEATE & FILTER
30 MIN.: 9:40-10:00	TIME: 40 MIN.: 10:00 - 10:40	TIME: 30 MIN.: 10:40-11:20	TIME: 40 MIN.: 11:20-12:00
Designate and talk about team roles, time management, your ambitions, challenges on how you want to work as a team (roles, behaviors, visual cues), practical matters like dates and time slots. Go through the phases, timeframes and methods suggested by facilitator and adapt fits needed - remember to have breaks!	Understand and investigate the innovation themes to identify your individual and collective challenges to address. Align your assumptions and challenge your biases about the innovation theme.	Select and further define the opportunity for innovation that you want to work on. Develop a single scope problem definition you can test for ideas. Select people relevant and of interest with the competences in your team.	Use idea generation techniques to diverge and broaden the range of full and sub-solutions - and select a few to bring to the next phase.
<p>Insert prioritized activities:</p> <ul style="list-style-type: none"> Team description Present your purpose Strategize, Learn, Contract Norming & bonding 	<p>Insert prioritized activities:</p> <ul style="list-style-type: none"> Midtemp Deep research Align research Journey map Assumptions 5 Ws 	<p>Insert prioritized activities:</p> <ul style="list-style-type: none"> Brainstorming Brainstorming Brainstorming Brainstorming 	<p>Insert prioritized activities:</p> <ul style="list-style-type: none"> Negative brainstorming Brainstorming Brainstorming

Figure 9.5: MIRO templates with links to the Universal Design Playbook.



Image 9.6: Ability cards are used as part of a board game to reflect on accessibility on campus.

The Universal Design Playbook was later used alongside the online design tool MIRO by 600 thesis students at a workshop day focused on making DTU's campus even more accessible (Figure 9.5). The MIRO tool was also structured according to the double diamond

model, with alternating phases of divergent and convergent methodologies used to identify the problem domain and to design solutions. To facilitate the learning process, links were provided in advance directly from the MIRO board to the Universal Design Playbook methodology descriptions used by the students, as well as Universal Design Playbook templates to structure the developed content. The Ability Prompt Cards were also introduced. There is a plan for a large number of DTU's thesis students to participate in a similar workshop in the future. In the longer term, the intention is for all DTU students to familiarise themselves with the Universal Design Playbook.

9.6 CAMPUS – Leaving no one behind

The Ability Cards have become part of a new board game, *CAMPUS – Leaving no one behind*, which is used during DTU's introduction week to assess and reflect on the accessibility of the campus (Image 9.6). For the start of the 2021 academic year, 450 students were divided into groups of 5 and given an Ability Card to imagine the challenges they might face in certain situations on campus. They were provided with props corresponding to the Ability Card they had been given to simulate the disability and develop an understanding of the opportunities and challenges people with such a disability may experience.

A good start gives you energy for more

Following the positive reception of both the Universal Design Playbook and the Ability Prompt Cards from students, start-ups and teachers at DTU, the next step is to continue with the iterative development of the website and the addition of further materials.

The cards have proven to be a powerful pedagogical tool – both for students and for entrepreneurs in the early stages of business creation. The next deck of cards is under development and will present the *7 principles of universal design* (Design U, 1997). A prototype

was tested in the master course *Holistic Design of Engineering Systems* and received a good response from the students.

A third set of cards is in the pipeline and will support the process of identifying potential biases in design and facilitate stakeholder dialogue on potential challenges and biases.

Both the Universal Design Playbook and the Ability Prompt Cards seem to have great versioning and scaling potential. Our ambition is to work with a wide range of partners in different educational programmes to unlock as much of this potential as possible. It is about realising universal design solutions that truly make a difference for everyone.

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10.0

Exploring the Person- Environment- Occupation model

Turid Borgstrand Øien and Roberta Cassi

Introduction

Denmark, like the other committed countries, is working in several areas to achieve the 17 Sustainable Development Goals (SDGs) set by the United Nations (UN) for 2030. Within this shared vision, the Leaving No One Behind (LNOB) agenda aims to reduce inequalities or other conditions that could leave people behind in individual and societal thriving. In pursuit of this goal, the UN Committee's recommendation is to develop strategic research models and working frameworks that focus on people's inclusion and participation. The Universal Design (UD) approach shows considerable potential to contribute to people's inclusion and participation by better aligning the designed environment with the needs of an increasingly large and diverse population. In line with the UD approach, the main concern of architects and other experts in the built environment is to design the environment with an awareness of the role it plays in preventing or supporting the physical performance and social participation of individuals with different abilities. To this end, practitioners need a thorough understanding of how people with different abilities interact with and experience the built environment. Therefore, current research and practices aim for more holistic and interdisciplinary approaches to investigate and address the complexity and diversity of individuals in relation to the design and use of the built environment.

The impact of the built environment on people's performance and participation is still an unexplored field in both practice and science, especially with regard to people with physical and sensory impairments. In the case of complex and multidimensional dynamics such as those between the environment and individual performance, analytical models can help to bridge fundamental theories and concepts of disability with more empirically observable phenomena occurring in the real world (Altman, 2001). Indeed, analytical models can support empirical studies by including, framing and observing individual and environmental factors and qualifying our knowledge of disabling and enabling mechanisms (Imrie & Luck, 2014) arising from person-environment interaction.

Until now, disability and restrictive conditions have been addressed mainly by focusing on the mis-match between the individual and the environmental dimensions. To this end, various analytical and operational models have been developed to support research and practice in understanding and assessing the role of the environment in determining disability conditions. Existing models, such as the GAP (Lid, 2013), the Housing Enabler (Steinfeld & Danford, 1999) and the User-Built Environment (Froyen et al., 2009) are all valid tools for considering the relevance of the environment, however, these models focus primarily on environmental barriers and personal limitations. The concepts of *mis-match* and *dis-ability* have been discussed extensively within the field of UD. In this regard, Hamraie (2013) argues that we need to acknowledge human variations, but without de-centering disability from *normate user templates* as this, in turn, creates mis-fits. Taking a different perspective, this chapter argues that the PEO model could offer a more rewarding approach and a novel contribution that does not focus on human disabilities and environmental barriers but addresses a broad spectrum of human abilities and the potential of the built environment in enabling people's activities. Knowledge transfer, between academia and industry or between different fields of research, is an important yet often not articulated part of a research practice (Jensen, 2010) which requires a critical "*reflection in action*" (Schön, 2016), why this chapter describes and explores how the Person-Environment-Occupation (PEO) model has been approached and used in research within occupational therapy (OT) and architecture. In two empirical studies, on low-vision rehabilitation and architecture for sport and leisure, the PEO model was further developed with a UD perspective and used as a theoretical and analytical framework to recognise and embrace the broad spectrum of human abilities and the potential of the built environment in supporting people's activities and participation. The cases presented allow us to discuss the value and potential of this conceptual model for gathering knowledge to be incorporated and operationalised in the professional perspectives of architects, occupational therapists and, not least, researchers working within and across these fields. Finally, by presenting the

possibilities and limitations of the model in these two applications, we explore the common ground for further interdisciplinary collaboration in the field of UD.

10.1 The Person-Environment Occupation model

Over the past 45 years, a biopsychosocial understanding of disability has influenced healthcare and society. Originating as an evolution of the limited biomedical paradigm (Engel, 1977), this more comprehensive understanding has driven several practice-specific frameworks, such as the so-called biopsychosocial framework for rehabilitation of the International Classification of Functioning, Disability and Health. Although the existing biopsychosocial framework includes the physical context as an influencing parameter, the conceptualisation and evaluation of the environmental factors are lacking (Whiteneck & Dijkers, 2009) and its operationalisation is still limited (Day et al., 2012). However, in line with this approach, more than 25 years ago, the Person-Environment Occupation (PEO) model was introduced to facilitate the practice of OT (Law et al., 1996), the main purpose of which is to assess and improve the relationship between the person, his or her occupation and the environment in which he or she performs it. To this end, this model was developed to conceptualise, plan, communicate and evaluate the performance of individuals in relation to their physical environments (Strong et al., 1999).

The model encompasses three overlapping spheres: the *person* – the unique being of mind, body and spiritual qualities, with a range of different roles, dependent on individual skills and abilities, and varying over time and contexts; the *environment* – the cultural, socio-economic, institutional, physical and social context; and the *occupation* – the entanglement of occupation, activity and task. The overlap of the three spheres represents occupational performance, a complex and dynamic phenomenon in which the transactional and temporal *fit* between the three spheres describes the quality of the

experience in terms of individual satisfaction and functioning. In this representation, the greater the overlap of the three spheres, the higher the quality of occupational performance.

10.2 Analytical approach

The understanding and use of the PEO model were explored in two research practices. In the first case, the model was used to reveal the tacit knowledge of the practice of two occupational therapists working as low-vision consultants in the field of low-vision rehabilitation. Here, the model also served to frame a shared analytical exploration in an action research collaboration. In the second case, the model was employed to develop the analytical framework used to investigate the spatial experiences of impaired users in two Danish sports and leisure buildings. In this case, the model served to identify the characteristics of the environment in support of cognitive, physical and social users' activities. By describing the use of the model in these two cases we aim to explore and ultimately discuss the PEO model in relation to its:

- a) characteristics for applying the model within a UD perspective
- b) application for analysing and organising empirical data.

Case1: The PEO model for understanding the occupational therapist and the processes of rehabilitation

Lighting recommendations in low-vision services have traditionally been conducted based on diagnostics, involving lighting assessments in the clinic. Visual acuity has been measured at a fixed distance while adjusting the overall lux levels, closely managed by the expertise of the professionals. Responding to a call for a more holistic approach to low-vision rehabilitation, the Center for Special Education (CSU) developed a new systematised method for lighting assessment in the pilot project *Better Light Better Living* (BLBL)

from 2017 to 2019. BLBL situated the assessment in the participants' specific social and physical context and supported the visually impaired as experts in their daily life, which was crucial for identifying relevant activities and appropriate lighting and BLBL showed improved visual performance and quality of life in the group of 60 visually impaired participants (Øien et al., 2021). To prepare the method for implementation and to explore the holistic approach to low-vision rehabilitation, an ethnographic action research project was affiliated with BLBL in 2018. The author being a researcher mainly occupied with the built environment, its role in people's everyday lives and how professionals work to improve this relation, the study was designed as an exploration of several concerns: the tacit knowledge of the individual in relation to their specific social and physical environment; the change and temporality within the rehabilitation process and, in a field of different professional backgrounds, the role of the practice knowledge of the occupational therapists conducting the intervention.

10.3 Framework for mapping relations, processes and practice knowledge

The initial mapping of the assessment and intervention of BLBL was based on participatory observations of the consultations in the homes of the participants. Taking notice of situations with or narratives of tacit knowledge; embodied in the participants or embedded in the technologies or practices (Øien, 2021), a core emphasis was put on the interaction between the low-vision consultant, the participants and their physical environment. The person-environment-occupation entanglement was represented in BLBL's overall focus on activities: Occupations were situated within specific social and environmental settings, and within the specific body and its abilities while engaging in the activity of concern. The activities chosen by the visually impaired participant represented situations where

the overlap of the three spheres was not aligned but dispersed, thus challenging the occupational performance.

The mapping showed that everyday activities included reading, writing, doing handicrafts or hobbies, locating things, orienting, preparing food, eating, doing housework, handling self-care and socialising. Activities were situated in social and physical contexts, and at different locations and areas in the house. Mapping the physical environment involved “*size and organisation of spaces; orientation; thresholds; window size and location; interior arrangements; surfaces and finishes; colours; patterns; design -, distribution- and position of lamps and the range of different bulbs and light sources*” (ibid., p.114). Personal aspects involved both their visual function and abilities, as well as other physical, motor, cognitive or emotional aspects. The personal sphere also involved the experiences related to their abilities and disabilities in the activity and their different experiences of light. In the majority of cases, the occupational performance was challenged due to insufficient or inappropriate lighting, but in some configurations, the performance was also impacted by the specific activity, the visual function or even the motivation of the individual. The relation between the individual and their environment in a specific activity could even be diverse and changing – some participants preferred more light for certain activities, dependent on both the social and the practical scope, but also due to aesthetical or cultural concerns. Across the 60 participants, enabling and disabling factors were seen in both activities, positions and settings within the home. Furthermore the needs and preferences concerning the light also differed, even in the same individual, depending on the activity and the social and spatial situation (Øien et al., 2021). Mapping these aspects showed that BLBL encompassed different kinds of otherwise tacit knowledge, such as *embodied knowledge* of the situated and activated body. The lighting assessment and intervention departed from the participant’s own bodily experiences where the impairment as such was secondary, more as a dynamic and relational condition dependent on the fit or misfit of the spheres. Furthermore, knowledge was also *embedded* within the environmental sphere, in the household appliances, assistive technologies, spaces and material artefacts, and

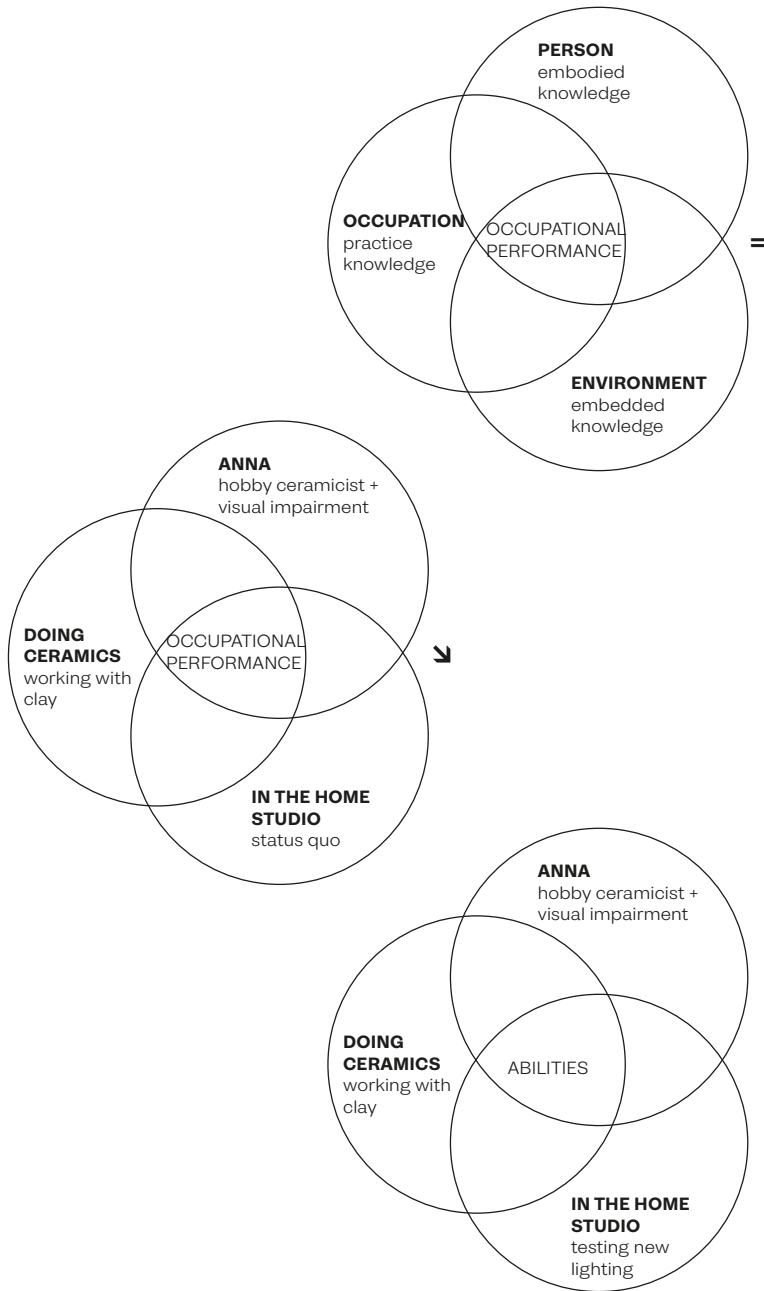


Figure 10.1. The person, environment and occupation, specified in the case of “Anna”, a hobby ceramicist experiencing difficulties in her home studio.

again dependent on the fit with the two other spheres, in the participants' use of these artefacts in their everyday practices.

Each case shows different degrees of occupational performance, for example one of the participants wanted to improve her conditions for modelling ceramics in her home studio and the assessment showed that she needed the interplay of shadows and light to help her perceive and work with the clay. In the intervention, they tested combinations of direct and indirect light, aligning these environmental factors closer to her functional abilities and activity at stake. Making it possible to move from a minimal occupational performance to regaining abilities, as shown in Figure 10.1. Maximising the fit of the three spheres meant that she could return to a hobby that she had given up on due to her impairment.

For others, the intervention helped mobilise family or friends (adjusting the social part of their environment) or enable internal motivation and an *I can do this*-attitude that made them approach and use their existing lighting in another way, adjusting the personal approach to the relation of the spheres. The parameters were dynamically interrelated and changes in one parameter affected the other.

The sequential trajectory of the PEO model supported the analysis of time across the sequences where the time between the consultations (at home, in the lighting lab and returning back home) played an important role in the progress of learning and change. The PEO fit was related to the process of the individual and the goals set for a specific activity in a specific setting and for a specific period (weeks or months) enabled the consultants to scaffold the relational development and transformation of the three spheres, as seen in Figure 10.2.

The approach combined the assessment of the relational aspects and the process, however not just as a PEO-fit, but also as navigation and coordination across the contexts of the home and the lighting lab. Within the trajectory of the PEO, moving from the specific and complex situation to the lighting lab played an important role in the intervention; to investigate the parameter of light, add new knowledge and let the participant recognise embodied and embedded

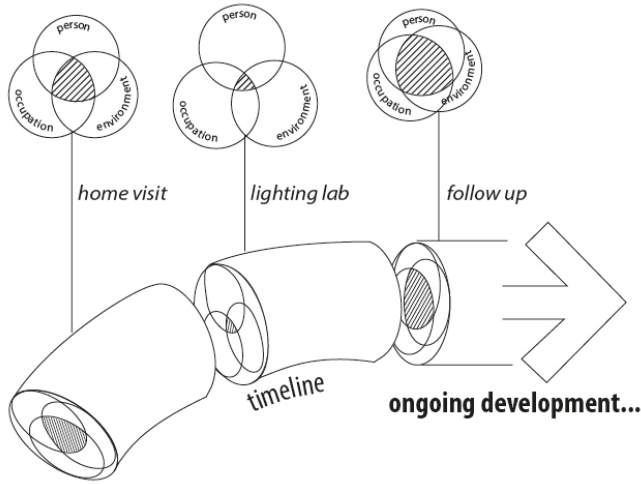


Figure 10.2: The three sequenses of BLBL – the home visit, lighting lab and follow up.

knowledge in the demonstrations of alternative lighting conditions. Even if the fit of the spheres decreased in the lighting lab session, the new knowledge helped scaffold the learning and change process and increased the overall occupational performance when relocated to the home.

The aim of the inquiry into the *therapeutic gefühl* and practice knowledge of the consultants was both to zoom out and assess BLBL as a new rehabilitative approach (Øien, 2022a) and to zoom in on the role of occupational therapy within this approach. To support the future knowledge transfer across an interdisciplinary low-vision service of pedagogues, teachers, opticians and therapists, we needed to understand the scopes and rationales of the occupational therapist. The PEO model served as a point of reference for investigating their practice knowledge (Øien, 2022b), but also to position the approach in the field of rehabilitation, “as a framework for discussing the consultant’s approaches [...] compared to a purely medical model approach” (Øien, 2021, p. 117). The tacit practice knowledge of the encounters was assessed by observing conversations, articulations

and positioning – the when and how to supplement the participants with new knowledge. Moreover, spatial conditions and material artefacts were used to scaffold their interaction with the participants and their environment: including schemas, measures, spaces, thresholds, lamps and lights.

The focus on the activity placed the participant and their knowledge at the centre of the assessment (Øien, 2022a). Emphasis was neither on the diagnosis (as in the medical model) nor on specific lighting levels (as in the previous checklists of the service) but on the interaction of both: In the situated activity which enabled the investigation of multiple and dynamic parameters. The situated activity involved both physical and social settings and the specific and practical asset made room for the participants to fully engage in the process, impacting both motivation and the ability to learn from the encounter.

Case2: The PEO-model for investigating the spatial experiences of people with mobility, visual and hearing impairments in sport and leisure buildings

Despite the social and regulatory progress made over the past few decades, people with physical and sensory impairments still cannot yet participate in sports and leisure activities on an equal basis with others (Barnes & Mercer, 2010). In line with the SDGs, the LNOB agenda and the Danish goal of reaching 75% of the Danish population participating in sports activities by 2025, the current need is to understand which design strategies to develop and implement to better support and stimulate the active participation of people, regardless of their different abilities. In order to identify the most influential architectural features in enabling impaired users' activities, the empirical study conducted within the PhD research *Disability, Experience and Architecture* aims to collect, analyse and provide architects with knowledge on: 1) how differences in physical and sensory abilities influence the perception and the use of the space; 2) how the characteristics of the built environment support and stimulate users with mobility and sensory impairments while they carry on their activities within the building (Cassi et al., 2020).

To gather this knowledge, users' spatial experiences were investigated in two contemporary Danish sports and leisure buildings – Vandhalla in Odder and Musholm in Korsør. These buildings were selected for this study because of the innovative solutions that architects implemented for an improved inclusion of people with physical and sensory impairments. Employing field notes, non-participant observations, semi-structured interviews and video-recorded walk-throughs, users were observed and questioned while performing their physical and leisure activities. The interviews and walk-throughs enabled the users to recall and openly discuss their experiences of the building, its areas, elements and features. To frame and structure the user insight and the related collected data, the PEO model was considered and further developed as an analytical framework that guided the coding process into the three main components of the model; the person, the environment and the activity. The model thus helped to better structure and analyse the collected data and identify relevant relationships between user characteristics, activities performed and architectural features.

From the PEO model to the analytical framework for investigating the spatial experiences of people with physical and sensory impairments in sports-and-leisure buildings

The analytical framework used in this empirical study is based on the human-environment relationship. The PEO model was thus taken into account because it considers the three main components of a spatial experience (the person, the environment and the person in the environment) and helps to better unfold and thus understand how these components and their embedded characteristics relate to each other (Figure 10.3-A).

Furthermore, the PEO model was considered because of the possibility to analyse the reciprocal transactional interactions (that is; person-occupation, occupation-environment and person-environment interactions). While these interactions provide occupational therapists with more details for evaluating and planning interven-

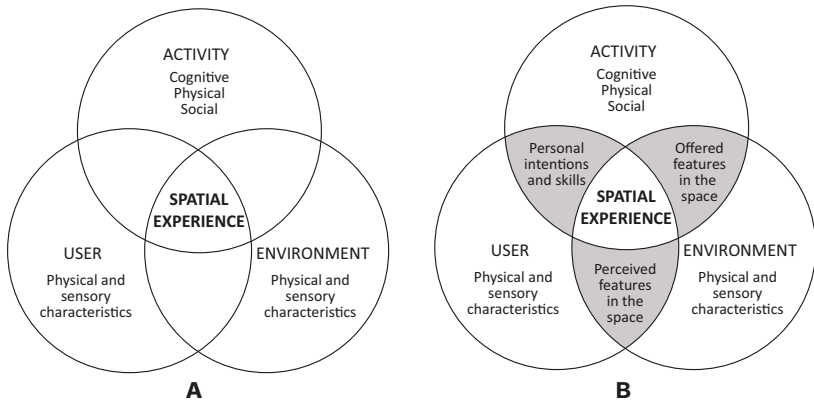


Figure 10.3. Analytical model: spatial experience as the intersection between the user, the environment and the activity

tions (Strong et al., 1999), in this empirical study, transactional relations were used to better compare architects' design intentions with individuals' actual use of the space. In the model used for this investigation, the three transactional interactions were in fact declined as 1) User-Activity: Personal intentions, 2) Activity-Environment: Offered features in the space and 3) User-Environment: Perceived features in the space (Figure 10.3-B).

To further clarify, an example of how the model was used in the study of a blind user's experience while entering one of the analysed buildings is presented below (Figure 10.4). The interviewee was a blind person (person), who was asked to walk towards the main entrance (environment) and then enter the building (activity). In this situation, the user, while walking along the facade of the building, expressed his intention to find the front door by perceiving the cues from the environment and finding information that could lead him (User-Activity) toward the entrance. During the walk-through, at one point, the user stopped and said: *I feel a different space here, the acoustic is different, so I guess the entrance should be somewhere here.* The specific characteristic of the entrance was in fact its collocation

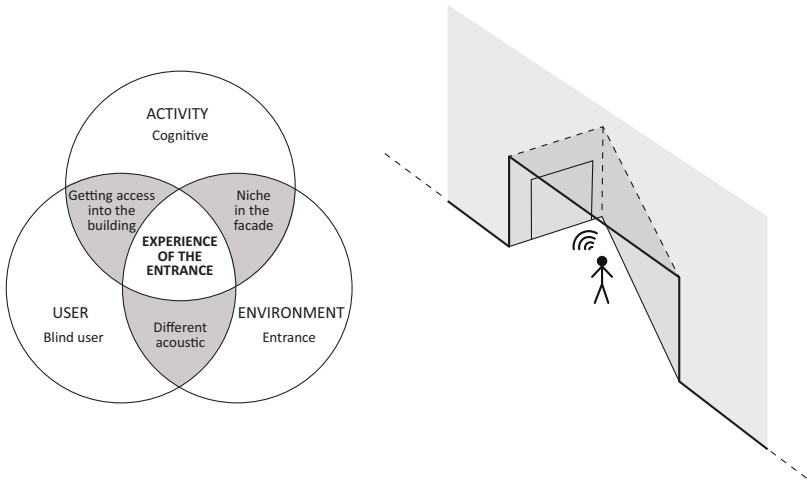


Figure 10.4. The analysis of the experience of the entrance

within a niche (Activity-Environment) which was perceived by the user (User-Environment) and used as a hint to identify the entrance.

This specific case demonstrates that a change in dimensions can support users in identifying spatial transitions and possible viable entrances/directions. Using this model, other spatial experiences were investigated and analysed in order to inform architects about the potential of the characteristics of the environment to support the cognitive, physical and social activities of users within sports-and-leisure buildings. For example, another finding from the investigation was that the presence of transparent partitions between the main distribution and the main room proved to be crucial in supporting spatial cognition and social interactions within the building. All interviewed users with a severe hearing impairment stated that being able to see from the corridor what was happening in the gym helped them to better understand the context they were in, as well as making sign language communication possible even between the two different spaces. Furthermore, it was observed that many users with severe physical disabilities, who could not participate directly in the activity, stopped along the corridor to watch and participate indirectly in the gym activities (Cassi et al., 2020).

10.4 The potential of the PEO model in architectural practice

The use of this model in architectural practice allows the person to be involved so to include the first-person perspective in the investigation of impaired users' spatial experiences. Although the focus in architectural practice is on the environment, this is analysed with reference to the person and his or her intentions to perform in the physical setting. In contrast to other existing analytical models used in architectural practice, such as the Housing Enabler (Steinfeld & Danford, 1999) and the User-Built Environment (Froyen et al., 2009), the PEO model allows for a broadening of the individual and architectural characteristics considered, without being limited only to physical impairments and architectural barriers. By relating the three main components of a spatial experience, the model also allows for the analysis of multiple interaction scenarios, including person-environment interactions that occur during cognitive and social activities. The ability to analyse these connections in contextual situations can provide architects with relevant information on the influence of specific environmental features on users, thus making them more aware and able to support the latter through design.

Unlike the first study, in which the time factor was central for assessing the individual in his or her functioning in specific physical settings, the focus on the characteristics of the built environment does not motivate the repetition of the analysis with the same person over time. However, repetition of the same analysis with the same person could provide additional insight into how specific environmental characteristics are perceived, memorised and embodied by the person over time. Certainly, the more spatial experiences are analysed, the more person-environment relations can be identified.

10.5 Discussion and conclusion

Within the UD perspective, there is an increasing need to handle the complexity and multiple nature of users and their performance in the built environment, especially in the daily lives of people with different needs, conditions and abilities. There is also a need for approaches and frameworks that facilitate collaboration between different disciplines and enable the sharing and pooling of knowledge and values. Accordingly, we explored the possibilities of the PEO model to support these efforts. The analyses show that the PEO model has great potential in supporting UD studies in the research and practice of different disciplines. The methodological framing of the PEO model supports UD's perspectives of understanding people's contextuality and wide range of abilities, both physical and cognitive. Furthermore, the model can provide a common ground for interdisciplinary collaborations both between different practices and between research and practice. Indeed, it offers the possibility to collaborate between practices that focus on the same or different components, opening up constructive reflections on the interactions between them. It also allows approaching different scales of detail and abstraction for each of its three components and their intersections, offering the possibility to connect theory and practice.

Summing up, the analyses revealed the following features of the PEO model:

- A *PEO's characteristics for exploring new possibilities of application within a UD perspective.* The two applications of the model show that the relational and operational characteristics of the PEO model offer new ways of exploring the person-environment relationship. They make it possible to focus on users' abilities and the supportive characteristics of the environment, rather than only on disabilities and environmental barriers. In both cases, the PEO model was exploited from a UD perspective to explore the potential of the built environment in enhancing spatial experiences and supporting transformation processes to improve user performance and individual thriving. The *fit* of the interaction

between person, environment and occupation is aligned with the UD vision of bridging the gap (Lid, 2013) through user involvement (Hamraie, 2013)

- B *PEO's application for analysing and organising empirical data.* On a practical level, the model was used in the respective research fields for bridging the theoretical and empirical contexts. Furthermore, the model was used at different levels and for different purposes: as a tool for the observation and the analysis of complex dynamics, at a *meta-level* to understand the therapists' approaches along the rehabilitation process of the users, or at an *operational level* to analyse users' perceptions of and relationships with the built environment.

In conclusion, from a UD perspective, the PEO model is an available tool to frame the interactions and processes involved in the functioning of the individual in the environment. In the cases presented here, the PEO model was used in research and in different disciplines. Both have used the model to analyse, generalise and communicate contextual situations to a given practice, and the common ground of the model has allowed us to engage in rich discussions and reflections on the ontology and epistemology of our research (Jensen, 2010; Schön, 2016) as well as the considered practices. Furthermore, these discussions allowed us to reflect on the act of doing research on the topic of the built environment, including the transfer of knowledge between the professional and academic worlds. Sharing and using the same model, without losing the context of the field of application and the different interpretations of its use, opens the way for interdisciplinary collaborations, between OT and architecture and within research and practice. Last but not least, the use of a model that embraces differences in abilities and the supportive role of the environment in both physical performance and social participation allows the value of inclusion to be pursued considering the complexity and diversity of individuals.

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11.0

The way forward – critical constructive perspectives on universal design

**Inge Storgaard Bonfils, Leif Olsen
and Anne Kathrine Frandsen**

Ronald C. Mace (1942-1998) developed his thinking on universal design based on his knowledge and professional skills in architecture and his lived experience as a wheelchair user. Mace contracted polio as a child and, as a result, had reduced physical function and required a wheelchair. This gave him a unique experience and insight into the consequences for him and others with physical disabilities whose conditions are not considered and reflected in the built environment.

When Ron Mace was carried up and down the stairs by his fellow students at the architecture school in North Carolina, USA, it was not merely an impractical measure. It was also an activity that had personal and social aspects. It served as a reminder that the building that housed the architectural faculty was not designed for people who use wheelchairs, thus blocking his access to education and career as an architect. The building's design had social implications that reached both backwards in history and into the future. The building was a structural factor that prevented or made it difficult for other wheelchair users to use it. This example shows that many buildings constitute structural factors that need to be changed so that, for example, people in wheelchairs can use them, obtain an architectural degree and become active in the architectural profession. This does not only apply to the question of equal access to our built environments, but to products and settings in a broader sense. Ron Mace's vision of universal design is a radical and wide-ranging approach to finding ways to design a society for everyone.

11.1 Materiality and structural traces

Ron Mace's experience, story and vision are a reminder of how the material environment structures everyday life and has far-reaching consequences that create processes of inclusion and exclusion that reach beyond the time in which the material objects or buildings are produced. That is why it is essential to join forces and develop

cross-disciplinary and cross-sectoral collaborations to help make universal design a reality.

In this anthology, the authors have worked across disciplines to explore various issues of human-materiality interaction: housing, products, digital technologies, transport systems, building processes, workplace design, educational, leisure and sports activities. The authors provide critical and constructive perspectives on how universal design may be developed in theory and practice. The author groups take different interdisciplinary approaches and perspectives on universal design and join forces in a critical, constructive collaboration to translate the concept of universal design into practical solutions for everyone. An essential part of this work includes normative and critical perspectives on buildings, technologies and products as more than just materiality.

Working from a historical perspective, Bonfils and Frandsen show how the architecture of institutions and residential facilities can function as a prism that reflects the values and views of human nature that have formed the basis for the social approach to and treatment of people with intellectual disabilities and other forms of cognitive disabilities. This chapter is based on the thesis that views of humanity are expressed both in the care practices that prevail at a given time and in combination and interaction with buildings and architecture. Furthermore, the chapter is based on a dynamic view of history, evident in empirical analyses of changes, from 18th century asylums and institutional buildings, similar to the contemporary hospital buildings, to the smaller residential facilities of the 1960's onwards to today's modern apartment complexes built as social housing. The chapter raises the question of whether universal design can uncover new critical perspectives on the housing and care practices that people with intellectual disabilities and other forms of cognitive challenges are offered today. Universal design is written into the Convention on the Rights of Persons with Disabilities and is thus supported by the view of humanity that the Convention enshrines. In that context, the authors emphasise the need to consider power dynamics in addressing the visible and invisible social consequences of housing. Any equalisation of housing conditions for

people with disabilities should be accompanied by an equal right to choose and decide where, how and with whom to live.

11.2 The material and social world from a bodily perspective

Mace developed the concept of universal design to create a critical distance to the architectural profession's approach to building for people with disabilities, which according to Mace was based solely on a discourse of accessibility. In the discourse of accessibility, initiatives aimed at ensuring access for wheelchair users, among others, were often seen as a separate addendum to the built environment. However, this approach still carried a stigmatising effect by showcasing individuals with different bodies as deviating or abnormal. Mace's experiences of encountering stigmatisation first-hand can draw attention to the fact that a person is also a body, and a social body, and that the physical and social body are constantly interacting in the material world in which humans live. Universal design, therefore, also involves thinking about and paying attention to the material and social world from an embodied perspective. The physical properties of the body help shape human experience and interaction with other people within the context of the physical spaces, buildings and products available at any given time.

Several of the authors in this anthology are concerned with the interaction between the social and the material, based on an interest in people with disabilities and the significance of the material environment for the activity and participation opportunities that people with reduced physical, mental, cognitive and/or social functional ability may encounter in their everyday lives.

In their chapter on *Product design – from ableism to more inclusive design*, Bonfils, Brandt and Severin show how the design of everyday products has primarily been based on an implicit understanding of what constitutes an average body and normal body functioning. Conceptions of the average person are based on, among other things,

mathematical and statistical thinking about average values for measuring the human body. Drawing on the critical disability studies concept of *ableism*, it is shown how people with physical disabilities experience their everyday lives as impacted by the difficulties and limitations caused by this design approach. The chapter highlights how newer design approaches such as *design for all*, *universal design* and *inclusive design* are based on designing products to be used by as many people (with different physical, cognitive and mental abilities) as possible. It also emphasises how approaches such as *participatory design* and *co-design* help make a crucial difference to the solutions that are developed and are therefore essential for putting universal design into practice.

Critiquing existing design approaches is also the starting point for Carreras, Holten, Jensen and Pedersen's chapter *Towards digital accessibility*. Reflecting academic thinking in *Crip Technoscience* and disability activism, the chapter argues for a political obligation to recognise that people with disabilities have expertise and knowledge that can be used in all phases of design projects, and to acknowledge the interdependence and interrelatedness of people across different modes and levels of functioning. The chapter describes three empirical examples of how people with disabilities can participate, or be excluded from participating on equal terms, in the digital age. It argues that digital accessibility is not only a question of technical access, but also social justice and social recognition. Digital technologies, as shown in the chapter on product design, can contribute to perpetuating existing forms of social inequalities and discriminatory attitudes towards people with disabilities. Designing technologies based on universal design principles and involving people with disabilities in the process broadens the perspective, from an approach to accessibility based on a static goal or checklist to an approach based on constant exploration and questioning. The view, thus, is expanded to conceive accessibility and universal design as a social justice project constantly negotiated in socio-material and political contexts.

Critical disability studies' theories of ableism and disability activism largely stem from the lived experiences of discrimination and

exclusion that people with disabilities report, as also seen in Mace's development of the concept of universal design. According to Merit, Ballegaard, Kajita and Brandt, universal design can be seen as a conceptual lens that sensitises us to the layers of dependencies embedded in specific contexts. However, this requires an understanding of universal design as a pluralistic concept that renders visible the multiple, coexisting descriptions of the dependencies experienced by a person. It involves a demand to achieve dependency sensitivity through in-depth insights into the everyday experiences of, for example, wheelchair users. As a reader, we are taken along on Peter's journey from home to his workplace via trains in the Copenhagen cityscape. This kind of in-depth everyday storytelling fosters sensitivity towards not reducing design tasks and processes solely to functionality. It demonstrates how the social and cultural context is just as important as the physical realm in shaping people's bodily perceptions and dependencies. These experiences can be used to understand experiences and needs that can then be utilised to put universal design into practice.

11.3 Theory and methodology

Realising the potential of universal design relies not only on a value-based orientation towards the underlying view of humanity. According to several authors, there is a need to further develop the theoretical and methodological basis to integrate universal design into different practices in the design disciplines and other professions. This can be done by educating professionals and developing tools and methods to guide professional and interdisciplinary thinking about universal design and the practical quest to put universal design into practice.

In Bredgaard and Martiny's chapter on *Universal job design*, the concept of universal design is used as a starting point for revitalising the possibilities for people with disabilities to find their way and participate in the labour market. Previous studies have shown that

many workplaces are not accessible for people with physical disabilities (e.g. wheelchair users) or don't have jobs that suit the person's functional and working abilities. Can a new concept of *universal job design*, inspired by the principles and goals of universal design, contribute to a renewed focus on designing workplaces and jobs to be accessible to everyone, regardless of disability? Drawing on Mace's concept and the seven principles of universal design, the authors develop a theoretical proposal for an idea of universal job design that complements the focus on individual compensation and workplace adaptation to diversity and multiplicity in job design. By doing so, universal job design could help increase employment for people with disabilities and strengthen companies' social and business foundations.

Universal design is a concept that originates from the architectural profession but is not fully embedded in practical construction and design processes. Merit, Gramkow, Kajita and Stigsdotter argue that architects need a working tool consisting of guiding questions that can be integrated into architectural practices. The chapter *Asking the right questions – guiding Universal design practices* presents a list of frequently asked questions about design processes and what an alternative to such questions might look like if one aims to practice universal design. Based on a qualitative study in landscape architecture, a guide with questions concerning the typical practices in a design process is developed – concerning rules, integration of universal design in the process, social and ethical responsibility, and evaluation and learning. These questions can make a crucial difference in putting universal design into practice, as they focus on the qualities and dimensions of universal design throughout the design process.

Falster and Pedersen's chapter on *Norm criticism and norm creativity as a starting point for a more inclusive view of humanity in pedagogical and social work* similarly deals with integrating universal design thinking into professional practice. At the same time, they criticise the atheoretical nature of universal design and the lack of clarity about the underlying understandings of people and society. Based on the sociologist and philosopher Axel Honneth's theory of recognition, the authors interpret the social philosophical assump-

tions about human freedom and the good life as a possible way to anchor universal design within a theoretical paradigm. The authors emphasise the importance of professionals developing their skills to think critically and creatively about norms. This will entail professionals critically analysing the norms taken for granted and perceived as self-evident, normal or natural, and then working creatively to develop other practices. Falster and Pedersen illustrate this through examples from educational and social work with children and young people with varying functional abilities, showing that critical and creative thinking about existing norms is essential in translating universal design into practice.

Valgeirsdottir, Hansen and Skovgaard's chapter on *Pedagogical tools for teaching universal design* presents a concrete tool for promoting an understanding of universal design among university students to ensure a practical anchoring of the concept in the students' work. The example comes from the Technical University of Denmark (DTU), where the authors developed a Universal Design Playbook to support the planning and execution of design processes and co-creative workshops. The pedagogical tool has been tested and used at the University of Southern Denmark. It is linked to learning methods within problem-orientated pedagogy, where students are challenged to think in terms of universal design and find creative solutions through games. The example shows us that concrete pedagogical tools are important in educational environments for different professions.

Another pedagogical tool to promote universal design thinking is presented in Øien and Cassis' chapter *Exploring the Person-Environment-Occupation Model across theory and practice: Two empirical case studies*. The PEO model was developed within occupational therapy and is an internationally recognised analytical model for analysing the interaction between a person, their surroundings and their activity performance, and assessing the quality of that activity performance. The authors demonstrate the potential of the PEO model in universal design in architectural practice where the study, analysis and design of spatial environments and buildings are of

great importance for all users, especially those with mobility, vision and hearing impairments.

11.4 Interdisciplinary collaboration is essential to advance universal design in theory and practice

The concept of universal design has been criticised from several perspectives. For example, the idea of universality can, it is argued, encourage a positivist mindset where universal design is understood to be achieved through a checklist approach with predefined solutions. It can obscure the understanding of human diversity, plurality and the importance of social aspects in inclusive practices, which several authors emphasise in this anthology as the end goal in a universal design context.

The concept of universal design has also been criticised for neglecting what makes people different. As humans, we share many similarities, but people are also different, and people's physical and mental functioning also vary over a lifetime. Designing for people with certain types of disabilities may exclude others. In addition, people's preferences are different, which in terms of design means that they have different desires and dreams, attitudes and requirements for products and concepts of what is aesthetically beautiful and sound design.

At the same time, it can be highlighted that the open nature of the concept of universal design can inspire interdisciplinary collaboration, which can lead to the theoretical development of the concept. In this anthology, the interdisciplinary collaboration between the authors has led to theory development and framing of new analytical and methodological tools that link insights from disciplines within, among others, health research, social research and labour market research to the field of universal design.

In conclusion, we wish to highlight how interdisciplinary processes and perspectives can encourage insight-oriented and appli-

cation-oriented new developments in universal design research, in theory and practice.

In 2020, Bevica Fonden initiated the interdisciplinary research network behind this anthology. The aim was to support universal design as a research-based field of knowledge. Universal design is regarded as a value-based concept that challenges existing perceptions of humanity and contributes to the fulfilment of the United Nations' *Leave No One Behind* agenda within the Sustainable Development Goals. LNOB is about ensuring equal inclusion of everyone, including people with disabilities. Universal design offers a new understanding of human diversity, where all people, with all their differences in ability, are equal. Universal design dissolves the human categorisation of *them and us* that is often reflected in design solutions and instead points out that *diversity in user needs requires diversity in solutions*. Universal design is a concept based on a vision of creating equal solutions for all, and the concept can be seen as a fundamental premise for us all to participate in society on equal terms – thereby creating a basis for leaving no one behind – LNOB.¹⁸ Based on this humanistic perspective, researchers from different disciplines and research traditions have been brought together to *learn with, from and about each other* in a dialogical process, creating a fertile ground for developing an interdisciplinary research field for universal design. The research network behind the anthology therefore wish to encourage each other and others to develop an interdisciplinary research field that can contribute to a more robust theoretical and practical anchoring of universal design. In this context, we recognise the potential for a dialectical process between theory and method development to inspire the formulation of new research questions and introduce the concept of universal design into new conceptual and educational learning spaces and communities of practice.

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Psychologist John Paulin Hansen has spent 30 years researching how to use eye-controlled technology. People with motor disabilities can now write with their eyes or control their wheelchair with

them. Soon they will also be able to manoeuvre a telerobot or direct a robotic arm to grab whatever they are looking at.

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Kristian Moltke Martiny has an interdisciplinary research background, completing a Master's degree in philosophy and anthropology, a PhD in philosophy and neuroscience, and a four-year postdoc project in the fields of psychology and sociology. His research is primarily in healthcare and working with people with brain injuries, physical disability and mental illness. In addition to his research, he has worked for three years as head of department at a health institute, co-founded four research-based organisations, and has been on the board of several organisations in the consulting and culture industries.

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Marcus Tang Merit is a sociologist and PhD student at the Royal Danish Academy. He researches architects' methods and design processes, with a particular interest in architectural drawings and visual analyses. As part of his research, Marcus also studies inclusive public urban spaces and the inclusion of physically disabled users in the design processes that precede such spaces.

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Ulrika K. Stigsdotter is a professor of landscape architecture, specialising in Health Design at the University of Copenhagen. She leads an interdisciplinary research group that focuses on the interaction between humans, nature, health and design. Ulrika is responsible for the Nature, Health and Design Lab, which includes the Nacadia® Therapy Garden, Octovia® Health Forest and Move Green.

This anthology is funded by Bevica Fonden. Bevica Fonden is a foundation that, through partnerships, works to strengthen conditions for self-governance and independent life for people with mobility impairments. This work is based on research and knowledge on Universal design as an interdisciplinary and value-based concept.

This anthology is the first joint publication by the Bevica Foundation's cross-disciplinary research network. The anthology offers an insight into universal design as a field of research and unfolds cross-disciplinary perspectives on universal design as theory, method and practice.

The Bevica Foundation's cross-disciplinary research network has been established to strengthen the field of universal design as a research-based field of knowledge.

Universal design can serve as a means to meet the complex challenges spanning all frameworks around everyday life. Therefore, the network has a cross-disciplinary profile.

The researchers in the network are appointed personally and all of them focus on universal design and inclusion in their teaching and research, though by way of very different perspectives.

The cross-disciplinary research network is facilitated by the Bevica Foundation's Universal Design Hub.

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