MODULE 1

INTRODUCTION TO AGE-FRIENDLY AND INCLUSIVE ENVIRONMENTS

UNIT 4

TOWARDS HUMAN-CENTERED DESIGN

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DESIRE

DESIGN FOR ALL METHODS TO CREATE AGE-FRIENDLY HOUSING

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DESIRE will provide professionals in the building industry and home furnishings sector with the tools and skills to apply Design4All methods as an integral part of the design process, with the aim to create or adapt age friendly housing as a solution for the wellbeing, comfort and autonomy of the older adults or dependents at home.

The DESIRE training platform consists of six modules and 21 units.

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UNIT 4 – TOWARDS HUMAN-CENTRED DESIGN

This unit provides overview of the basic principles and methods focused on human-centred design approach (people at the heart of the design process) related to the built environment, such as the methods of Universal Design / Design for All, legislative frameworks, and European initiatives. It also includes introduction to the basic principles of complex comfort/well-being based on body-conscious design and neuroergonomics. This unit aims at acknowledgment of human diversity and different needs and requirements of all people in the built environment, including older people and persons with disabilities.

4.1 DIVERSITY OF PEOPLE IN THE BUILT ENVIRONMENT

IN A NUTSHELL

People have various needs, body forms, abilities and preferences. To create a human-centred friendly environment for well-being, architects and designers learn about complex and diverse human characteristics and needs, e.g. using guides, standards and schemes from ergonomics.

Accepting the diversity of people and the individuality of each person is a basic prerequisite for creating an inclusive environment. The challenge in architectural design is to create such an environment that is not only responding to the functional needs of the people, but also reflecting their psychosocial, cultural, and other needs.

4.1.1 Diversity of people

To understand the diversity of people, it is essential to know the basic requirements and needs of a wide range of users of the built environment. The International Classification of Functioning, Disability and Health (ICF, WHO 2001) provides a terminological basis, including components and factors, that are important for the creation of an inclusive environment, products, services and information and communication technologies. The ICF explains “Functioning and Disability” and “Contextual Factors”, thus a person's functional ability is understood as a holistic concept that includes all body functions, activities and participation in the environment and society.

The ISO GUIDE 71: 2014 (E) Guide for addressing accessibility in standards emphasizes the diversity of human abilities and characteristics, which change over a person's life and can be very diverse even among individuals of the same age group. The aim is to achieve universal accessibility (based on the identification of peoples' needs and requirements), so in the fields of architecture and design, we recognize, for example, the spatial requirements of people with diverse mobility, people with visual impairments and people in wheelchairs.

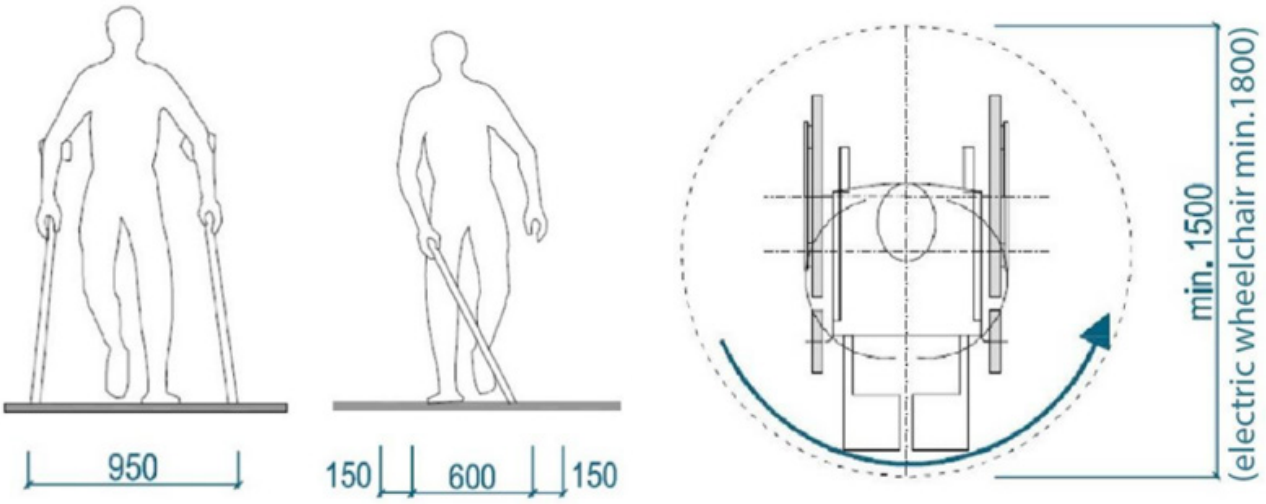

Figure 1.4.1 Examples of spatial requirements of a person (1) with mobility impairment, (2) with visual impairment, (3) in a wheelchair (Suláková)

4.1.2 Impact of the environment on human well-being

Psychology and neuroscience draw attention to the psycho-social aspects of the environment and examines the impact of the environment on people's health and well-being. Dak Kopec (2012) in his book “Environmental Psychology for Design” presents three basic levels of human-environment interactions: physical, social and biological. Eve Edelstein (2016) introduces the new term “neuro-universal approach”, as a response to the diversity of human abilities in the cognitive area (sensory perception, memory, orientation skills, emotions, etc.).

An inclusive environment is not just about the physical accessibility of the built environment, but considers several factors, such as the psychological, social and cultural needs of a person in the environment, which are related to how a person perceives and feels (safe, tolerant, friendly).

To learn more about the diversity of people in the built environment and the impact of the environment on human well-being read the MODULE 3: Age-friendly built environment – ARCHITECTURE, Unit 1, Chapter 1.1.

4.2 EMPATHIC AND SIMULATION EXERCISES

IN A NUTSHELL

In order to understand the diversity of people and their requirements in the built environment, there are empathic and simulation exercises that help us to experience different peoples´ situations. To cover heterogeneous groups of people, exercises should consist of:

- Simulation of a blind person's movement with a white cane
- On-site survey from the position of person in a wheelchair
- On-site survey by using a stroller with a small child or using heavy luggage.

The human-centred approach in the design process is based on cooperation with various people in participatory planning. Empathic exercises are based on three steps: (1) exploring people/users, (2) immersing into other people's lives through a simulation experience, and (3) connecting with people/users (Kouprie, Visser, 2009).

4.2.1 Practical on-site survey and simulation in the built environment

Simulation exercises can be conducted in an existing built environment (Figure 1.4.2) or in an artificially created environment for a specific purpose, such as a simulation exhibition (Figure 1.4.3). These exercises can help students/visitors to test the accessibility, safety, perceptibility and usability of different spaces, information and products. Empathic exercises help to understand the interaction between people and the environment/society.

Simulation exercise shifts attention from visual perception of architecture to more multisensory experience of all components of the environment, including sound, tactile and olfactory characteristics of the space.

To learn more about the empathic and simulation exercises in the built environment read MODULE 3: Age-friendly built environment – ARCHITECTURE, Unit 1, Chapter 1.2.

Figure 1.4.2 Simulation exercises in the built environment – in cooperation with Slovak Blind and Partially Sighted Union (Čerešňová).

Figure 1.4.3 Simulation exercises in an artificially created environment – exhibition with different types of spaces (Čerešňová)

4.2.2 Method of simulation as an improvement tool for design process

When designers create products for people, it is vital to understand not only the anatomy of the human body but also other human characteristics to design more suitable products. The goal is to ease life and help people in everyday situations. Simulation exercises have proven to be crucial at the beginning of every design process. Especially when designers experience difficulties they have never experienced before. Exercises help designers to understand people's needs and requirements and even increase the level of empathy. After these experiences, they are ready to propose better design solutions.

During our research project, students were able to try to design products for people with diverse needs prior and after using a simulation method. Most of them were surprised when they experienced new or unexpected situations. Exercises helped them to re-design their initial design ideas and increase their empathy level.

4.3 HUMAN-CENTRED DESIGN METHODS AND PRINCIPLES

IN A NUTSHELL

There are various methods to achieve a Human-centred design:

- Universal Design (origin in the USA, 7 principles)
- Design for All (origin in Scandinavia)
- Inclusive Design (origin in the UK, 5 principles)
- Body conscious design and neuro-ergonomics (design for well-being)

The diversity of people must be considered when creating the built environment, so that equal opportunities are given to a wide range of people in terms of the physical environment, products, services and information. Therefore, it is necessary to use methods such as Universal Design, Design for All, or Inclusive Design, which emphasizes a human-centred approach focused on people and their diverse needs, demands and abilities. Different terminology of methods with human-centred approach is related to the cultural-geographical and historical background.

Human-centred design is defined by the international ISO standard (ISO 9241–210:2010 Ergonomics of human-system interaction. Part 210: Human-centered design for interactive systems). It improves human well-being, user satisfaction, accessibility and sustainability. Human-centred design is moving the focus from the user to the person, it means considering the recipient not only as a user, but as a carrier of needs, desires, emotions that go beyond the most functional aspects, it is characterised as an innovation inspired by people.

Figure 1.4.4 Diagram with basic featured of human-centred design (Suláková according to IDEO, 2011)

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Universal Design (Figure 1.4.5) does not provide the same solution for all ("one size fits all") but emphasizes the need for flexibility and adaptability of the environment so that it can reflect the individual needs of a wide range of people with diverse abilities and constraints. A major milestone in the development of Universal Design was the formulation of Seven principles of Universal Design (NCSU, 1997) developed within the research centre at the North Carolina State University, coordinated by architect, designer and educator Ronald L. Mace. Universal Design, with its principles, defines the resulting characteristics of the product and the built environment usable for a wide range of people.

The **Design for All** (Figure 1.4.6) method was initiated by the European Institute for Design and Disability (EIDD) – Design for All Europe and has its roots in Scandinavian functionalism and ergonomic design. The EIDD Stockholm Declaration (2004) defines Design for All as design for human diversity, social inclusion and equality: "Design for All aims to enable all people to have equal opportunities to participate in every aspect of society." Design for All method is a holistic and innovative approach in making the built environment and products accessible and usable to a wide range of people.

The term **Inclusive Design** was used in the United Kingdom (UK) in the early 1990s, initially in connection with the "DesignAge" research project. Currently, the centre also uses the term "people-centred design," that is, human-centred design. Inclusive Design, unlike Universal Design, is more focused on the overall creative process and user participation in this process. The Commission for Architecture and the Built Environment (CABE, now the Design Council) in the UK defines inclusive design as "the process by which an environment is planned, designed, managed, implemented and used with respect to the human being". CABE is the creator of five principles and key concepts of inclusive design (CABE, 2006) (see Figure 1.4.7).

To learn more about the human-centred design methods and principles and their implementation in the built environment read MODULE 3 Age-friendly built environment – ARCHITECTURE, Unit 1, Chapter 1.3.

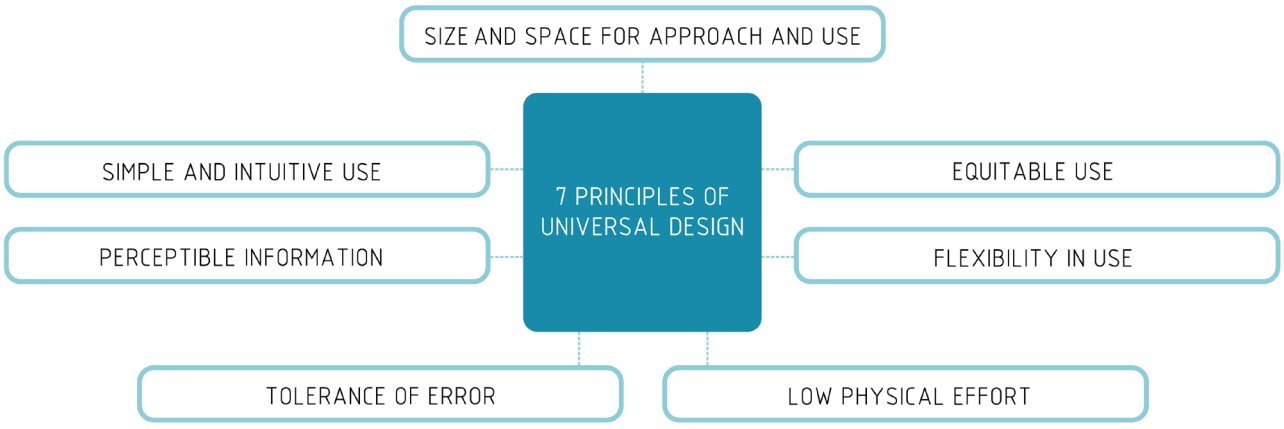

Figure 1.4.5 Diagram with seven principles of Universal Design (Suláková according to Connect Design, 2020)

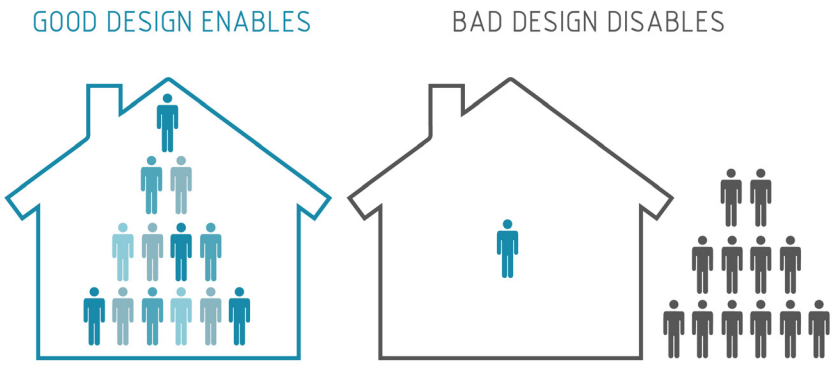

Figure 1.4.6 Diagram visualising the quote "Good design enables, bad design disables", Paul Hogan founding member of the EIDD – Design for All Europe (author of the scheme Lenka Suláková)

Figure 1.4.7 Diagram with 5 principles of Inclusive Design (Suláková according to CABE, 2006)

4.3.1 Body conscious design and neuroergonomics

Neuroergonomics is considered a combination of neurosciences and ergonomics where many new tools of quantitative methods to measure human responses arise in fusion with knowledge from social sciences. Thus, it gives complex and vital insights into the problematics of interaction between human beings and its habitat/built environment.

Thus, to handle the topic of ageing properly it is necessary to speak about prevention of civilization diseases already in youth and middle age. By exploring this topic in the previous research projects, we have found out two most important issues concerning built environment and its furnishings related to the most of civilization diseases – an **environmental stress and lack of movement**. The dynamisation of environment and reduction of environmental stress can lead to the prevention and reduction of civilization diseases impacts through aware spatial solutions and choice of materials to be used. Bringing into living, working and public space, an appropriate measure of natural physical activity, freedom of choosing body positions, and a reduction of stressful environmental stimuli in the long term stay spaces, can contribute to a better public health. Complexity of the research topic is analyzed and summarized in the Module 4: Age-friendly built environment – INTERIOR, specifically in the 11 principles of spatial design for well-being (feeling of safety, prospect and refuge, contact with outdoor, possibility to switch between privacy and socialization, own territory, attachment, appropriate scale and proportion, body consciousness, appropriate environmental stimulation, more natural materials) whereas also sustainability and environmental issues concerning choice of materials and way of constructions are included.

4.4 LEGISLATIVE FRAMEWORKS AND EUROPEAN INITIATIVES

IN A NUTSHELL

Several legislative documents, standards, initiatives and organisations aim to support the creation of a universally accessible environment.
Binding legislative documents:

- UN Convention on the Rights of Persons with Disabilities (CRPD)
- Union of Equality: Strategy for the Rights of Persons with Disabilities

European standards:

- Building construction — Accessibility and usability of the built environment
- Accessibility and usability of the built environment – Functional requirements

European organisations:

- EIDD – Design for All Europe
- EuCAN – The European Concept for Accessibility Network

Inclusion and accessibility for all people with various needs and different ages become increasingly incorporated into various conventions, declarations, standards, and networks.

Many countries and cities are proclaiming to take steps to create an inclusive and friendly environment for all. These intentions are reflected in their legislative frameworks and also in various initiatives (unions, networks).

The UN Convention on the Rights of Persons with Disabilities (CRPD) is a fundamental international human rights treaty of the United Nations intended to protect the rights and dignity of persons with disabilities. It contains definitions including universal design, mentions principles of respect, non-discrimination, participation and inclusion in society, equality, accessibility, and other, characterizes accessibility and other important information. This convention emerged from

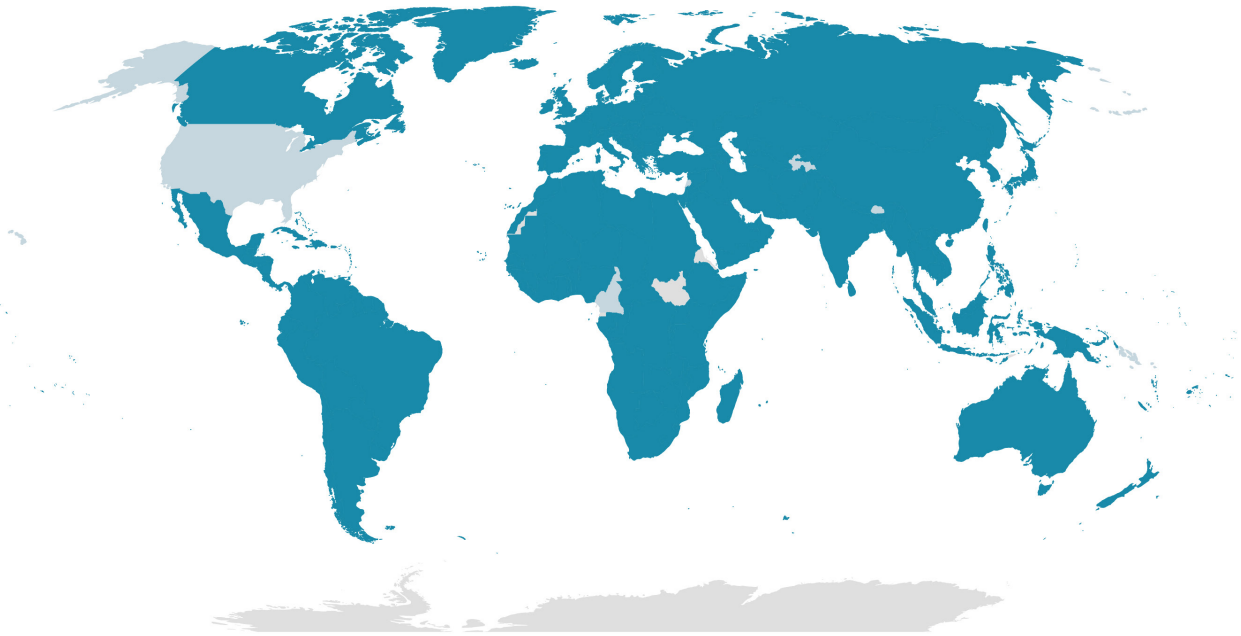

Figure 1.4.8 The map exemplifying the participative countries (light: signed the CRPD; dark: signed and ratified the CRPD) (Suláková)

several previous declarations and became widely accepted throughout the world. The European Union signed the CRPD in 2007 and ratified it in 2010. (United Nations, 2006).

Union of Equality: The Strategy for the Rights of Persons with Disabilities 2021–2030 (European Commission, 2021) follows the CRPD and other previous policies. Despite these several prior documents, the European Commission sees a need for improvement in this area because there are still many barriers and risks. In addition to these shortcomings, the Strategy for the Rights of Persons with Disabilities 2021–2030 also examines consequences of the COVID-19 pandemic. Similarly, to the CRPD, it discusses visions for accessibility, rights, autonomy, and equality. It focuses on the support of independent living: accessible, inclusive housing in the community. The document promotes appropriate community-based services instead of institutional services, which show many obstacles, thus they support deinstitutionalization (European Commission, 2021, pp. 10–12). The document further deals with inclusion in work, social protection, access to justice, education, healthcare, and other important areas of life such as culture and leisure activities.

Standards elaborated according to principles of accessibility and universal design are very important sources of information. Standards consist of texts accompanied with illustrations detailing requirements for inclusive built environment. They are essential, namely, for architects and designers. Important standards often used in this training material are the Building construction — Accessibility and usability of the built environment (ISO 21542:2021), and mainly Accessibility and usability of the built environment – Functional requirements (EN 17210:2021), because this standard has binding character for the European Union.

There are also **European organizational networks** dealing with issues of inclusion, accessibility, and universal design. EIDD – Design for All Europe, established in 1993, defines itself as a unique international platform for different organizations with a common goal: a more inclusive Europe for everyone. This platform spreads information about Design for All, promotes diversity, inclusion, and equality, and organizes events supporting these ideas. Another organisation is EuCAN – The European Concept for Accessibility Network. It states similar values as accessibility, inclusion, and human-centred philosophy, and publishes documents that promote the mentioned ideas in multiple languages.

To learn more about the legislative framework and European initiatives read MODULE 3: Age-friendly built environment – ARCHITECTURE, Unit 1, Chapter 1.4.

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