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Design For All: an Overview of Needs and Gaps in Formal Education in Four European Countries.

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ABSTRACT

Given that the average age of the European population has been increasing, physical spaces need to be adapted, so that older adults may stay independent for as long as possible. Towards that aim, building constructors, furnishing designers, and social care and health sectors need to be aware of the difficulties that older adults face in their homes. Design for All, Universal Design, and Smart Healthy Age-Friendly Environments are approaches that build and promote more inclusive spaces for everyone, regardless of their gender, age, ethnicity, or functional limitations. The present study aims to identify the needs and gaps at different educational levels, concerning the implementation of D4All methods in educational programmes in four European countries (Portugal, Slovenia, Slovakia and Spain). Desk research, interviews, and workshop sessions were conducted for the purpose of building a Matrix of Gaps, comparing the approach and availability of this topic in different educational fields and levels. Results show that there are differences between the countries, and that these topics are not sufficiently addressed in formal curricula, highlighting the need for this to be changed in the near future.

Keywords: Design for All, Ageing, Europe, Universal Design, Formal education, curricula

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1. Background

Across the European Union (EU), the average age of the population has increased. Older adults—65 years or older— account for 20.8% of the estimated total population of 447.2 million in the EU (Eurostat, 2022). By 2050, older people are projected to make up 29.4% of the total population of the EU. According to the World Health Organization (WHO) (2022), despite the increase in average life expectancy, the number of years that older adults live in good health has remained constant, meaning that people are living longer but less healthily and consequently with a lower quality of life.

The importance of the older population to the European society is undeniable. Like younger individuals, older adults buy and use services. Many of them volunteer when they retire and are crucial to the functioning of organisations and institutions (several would not survive without them). Most of the older adults are a source of knowledge and an important part of a closer social circle (for instance, they help in caring for the children in the family). Moreover, they share their knowledge and experience with the younger generations and spend quality time with them. It is essential that the environment encourage successful and healthy ageing (Menec, 2012).

According to the model developed by Rowe and Kahn (1987; 1997), successful ageing is defined as high physical, psychological, and social functioning in old age, without major diseases. However, this concept has been strongly criticised because it is based on the same objective criteria for different age groups and does not fit the needs of later adulthood, where some subjective criteria such as life satisfaction, affective and psychological well-being seem to be more important (Plugge, 2021). Even the authors of the model have pointed out the need to include social factors in the assessment of successful ageing (Rowe and Khan, 2015). Nowadays, the concept of successful ageing is considered a multidimensional term covering objective and subjective conditions in the physical, social, functional, and psychological domains of health (Annele et al., 2019).

Ageing is a normal part of human development, involving physiological changes that affect functional and mental abilities and increases the risk of diseases. But the magnitude of these changes is not the same for all people as it is influenced by many factors, physical and social environments (WHO, 2022) among others. Environments such as communities, homes and neighbourhoods, but also factors like gender, ethnicity, or socioeconomic status influences ageing and its perception as successful or unsuccessful. Physical and social environments can be a barrier or an incentive that influences health behaviours, enabling or preventing people from doing what is important to them, even if their physical or mental abilities are not the same as before (WHO, 2022).

To provide opportunities for successful ageing, it is crucial to adapt residential buildings that are usually not adapted to the needs of older adults in Europe. To this end, innovative measures must be applied in the building and furnishing sectors, which will contribute to accessibility, well-being, and physical and mental health for all (Moreno-Rodriguez et al., 2021). In Europe and worldwide, there are standards, legislation, and ergonomic schemes that are followed by designers and architects in order to create human-centred friendly environments. The International Classification of Functioning, Disability and Health (ICF, WHO, 2001) provides the terminological basis that allows to create inclusive environments, products and services. The ISO/IEC Guide 71:2014, is another example of a framework that is of relevance to designers and architects: provide guidance on addressing accessibility requirements and recommendations in standards that focus on systems (i.e., products, services and built environments) used in daily life.

The European Union has adopted several policy documents concerning the implementation of D4All, such as: (1) Resolution ResAP (2001)1 on the introduction of the principles of Universal Design into the curricula of all occupations working on the built environment (Council of Europe, 2001); or (2) Recommendation CM/Rec(2009)8 of the Committee of Ministers to member states on achieving full participation through Universal Design (Council of Europe, 2009).

There is an urgent need to invest in the development of Smart Healthy Age-Friendly Environments (SHAFE) in Europe and beyond. This concept was created in 2017 and refers to a holistic approach that aims to optimise social and physical environments, supported by digital tools and services that promote independent living, equity, and active participation in society (Dantas et al., 2021a). To meet this objective, it is necessary to engage citizens, communities, and specific sectors like the Information and Communications Technology (ICT), building industry, urban planning as well as the health and social care sector (Dantas et al., 2021a). Only by doing so, will it be possible to invest in the reconstruction of new and existing spaces, making them smarter, responsive to users' needs, sustainable, and healthier (Dantas et al., 2018). The SHAFE approach is in line with the concept of Design for All (D4All). This concept is related to the pursuit of equal access for all, which in turn promotes the physical and mental well-being and safety conditions that older adults should have. According to the Stockholm Declaration of the European Institute for Design and Disability (EIDD) (2004), D4All has its roots in Scandinavian functionalism of the 1950's and ergonomic design of the 1960's, as well as in the socio-political concept of a "Society for all" promoted by Sweden. D4All is a tool and an approach that aims to provide everyone with equal opportunities to participate in all aspects of society. "To achieve this, the built environment, everyday objects, services, culture and information – in short, everything that is designed and made by people to be used by people – must be accessible, convenient for everyone in society to use, and responsive to evolving human diversity" (EIDD, 2004, p. 1). D4All is an approach that needs to integrate the characteristics of the user in the building environment. For example, the needs of future occupants must be considered when planning a new house – both in the near and distant future. In short, D4All must guarantee the environmental sustainability and economic viability of the design (Prestamburgo et al., 2019).

This approach has accessibility as the main goal: D4All aims to achieve solutions that respect human diversity, social inclusion, and equality. SHAFE has some of its roots in this concept although it is broader: there is a need to optimise the public and private environments in a way that makes them accessible to all, using and implementing digital solutions if relevant. This aim can only be achieved by listening and engaging citizens, professionals from relevant areas, and policy makers who enable societal change.

There is increasing recognition and awareness of the need to better integrate older adults into society. One of the key issues is to build homes and furnished facilities that are adapted to their needs. As people age, they may have difficulties with basic activities such as eating, bathing or dressing, mainly due to the physical and sensory functional limitations that affect vision, hearing, mobility, communication, or memory (Eurostat, 2020). According to the Eurostat report (Eurostat, 2020), 9.3% of people aged 75 or more in the EU-27 had severe difficulties with vision, and 19.1% had severe difficulties with hearing. Moreover, more than one in ten people aged 65-74 years experienced difficulties in walking. About 10% of people aged 75 years or more reported great difficulty in preparing meals, and in the same group 39.2% reported great difficulty in occasional heavy housework. This group is at greater risk of accidents, illness, or injury because their home is not adapted to their needs, they live alone and are often socially excluded. The concept of successful and healthy ageing are closely

linked to aspects of personal independence and inhabitants can be at risk if homes are not adapted to their needs (Eurostat, 2020).

It is, therefore, extremely important that professionals whose work affects the design and quality of the built environment include D4All as a natural feature in the design process. At the same time, it is necessary that professionals who work with older adults (social workers, doctors or nurses) know the methods and tools of D4All and how to apply them. This will ensure that older adults and future generations can remain independent at home for longer, as age-friendly housing can prevent social barriers and provide support for a variety of physical and mental activities.

This paper is based on the results of a transnational project involving organisations from Portugal, Spain, Slovakia, and Slovenia: DESIgn for all methods to cREate age-friendly housing (DESIRE), co-funded by the Erasmus+ Programme. The main objective of this work is to identify the current state of D4All in different educational fields and levels; the focus is on Vocational Education and Training (VET), but other educational levels were also contemplated in our search.

2. Methods

The qualitative study undertaken started with desk research that was conducted in all the above-mentioned countries to gain a comprehensive overview of the structure of educational and training organisations, offers and tools, as well as educational and training programmes available at various levels of education. Based on this initial research, data was collected through workshops, interviews, and surveys.

In Slovakia, professionals from the building industry, home furnishing sector, academics, and medical doctors were present at two workshops: 9 designers, 11 architects, 12 teachers, 3 ergonomists, 2 medical doctors, 4 care givers, 8 activists and representatives of different groups of people with disabilities, and 7 municipalities and local authorities. Also in Slovakia, two more workshops were conducted, with a focus on experts from social sciences and municipalities: 10 academics, lecturers at universities and scholars (social gerontologists, sociologists, ethnologists, social anthropologists), 1 occupational therapist, 4 municipality staff elements, and 5 representatives from non-governmental organisations dealing with age-friendly environments. In Slovenia, two workshops were conducted, with professionals from the areas of physical, mental health, and built environment (1 designer, 1 architect, 5 researchers in fields of health & care, and 2 formal caregivers in nursing homes). In Portugal, 22 older adults participated in the workshops.

This analysis made it possible to identify educational differences in relation to the D4All methods in each country, named IO1. Transnational Synthesis Report on Skills Gaps in D4All (c.f. Dantas et al., 2021b). The results were summarised in a Matrix of Gaps that describes, in a schematic way, the current skill gaps, risk areas, how to introduce new skills or approaches, and what or how the current educational landscape should be restructured to improve its effectiveness (c.f. Dantas et al., 2021b). Individual national tables were developed to compare training and existing curricula, which were then integrated into a broader gap table, for comparison between the involved countries. Later, the researchers focused on existing curricula from different educational fields relevant for the application of D4All in age-friendly housing: architecture, design, social work/assistance, medicine/healthcare or other relevant courses, with the following thematic areas: “D4All / Inclusive Design / UD – theory”; “basic physiological needs of (older) people related to the built environment”; “requirements on the built environment” (architecture, design, and ergonomics); advanced and assistive technologies; supporting activities, social atmosphere, and wellbeing in the environment; inclusive human-centred approach.

The matrix of gaps was filled according to the degree of urgency of the identified gap and the researchers attributed colours based on their own qualitative assessment. If the topics were present in the curricula of several or all levels of education, the name of the country was coloured green. Where the topic was present only at some levels of education, it was coloured orange. The colour red was assigned if topics were not present in any educational field. See Figure 1.

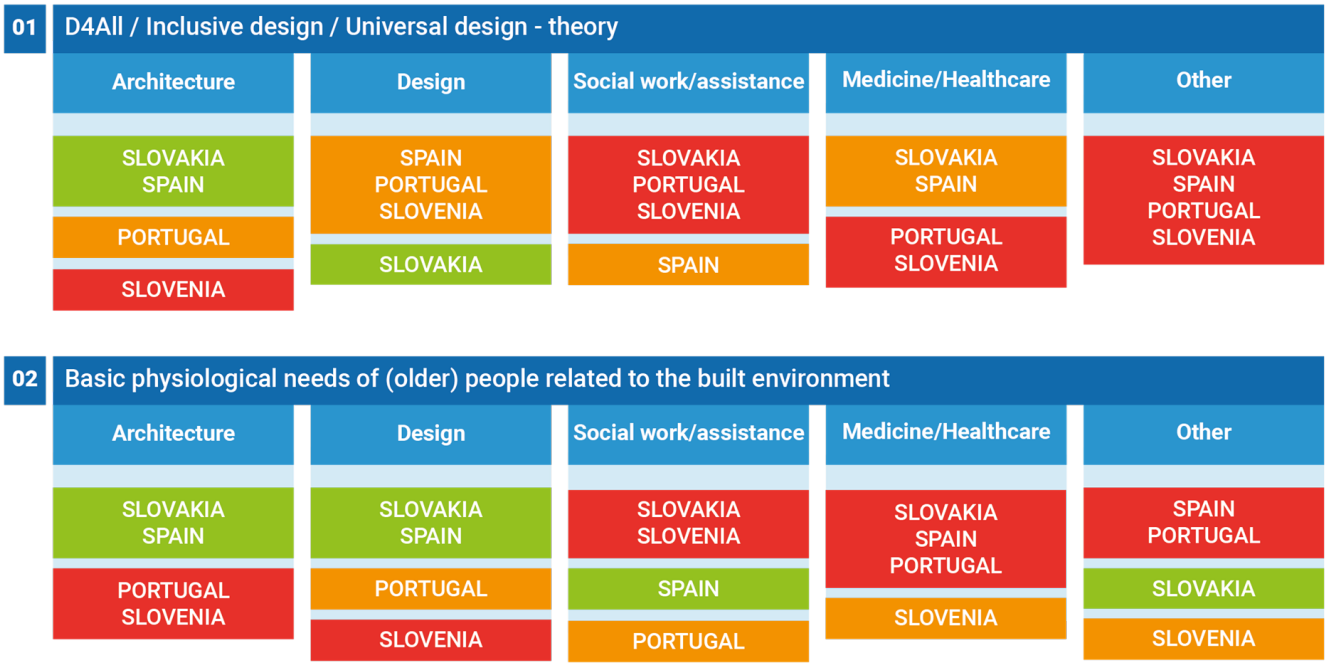

Fig. 1: Comparative matrix between the countries by thematic areas (example for two items)

3. Results

3.1. Training offers

As far as education is concerned, many schools in Slovakia address the basics of accessible design and ergonomics, especially in the curricula of Architecture and Design. D4All is a less covered topic, although schools often state that they guide students to think about user requirements and people with diverse characteristics and needs, which suggests an existing basis for the further introduction of D4All. Regarding social work/assistance, medicine/healthcare and other educational fields are not addressed at all or only at some levels of education. As these topics are not widespread, secondary schools must use teaching materials from universities, which highlights the need to develop more suitable materials. Concerning legislative and standard documents, these are mainly used at universities as study material.

In Spain, desk research showed that most courses only address the competences required by the regulations. It was not possible to identify any content related to D4All in many of the course trainings. In some cases, the stakeholders interviewed stated that these topics were addressed only transversally, as part of other specific topics, although it was not entirely clear how. In courses on architecture, D4All topics are covered, but in other educational fields with a more social focus these concepts are hardly present in the plans.

In Portugal, it is possible to find several master and postgraduate courses that include the topic, and a number of theses and publications that have been published in this field in recent years, showing an encouraging interest in D4All. However, it is clear that there are still only few professional courses related to D4All, and even when those are included as themes, the relevant content is covered only partially.

In the curricula of Slovenian educational institutions, D4All methods are rarely included. In secondary education and vocational courses of all education fields, there are none or only few references to ergonomics or D4All. As far as higher education is concerned, students have basic knowledge of ergonomics and ergonomic design, but courses on D4All methods were missing. Ergonomics are included in several health faculty curriculums but mostly in the context of workplace health promotion. Most courses do not cover aspects related to mental wellbeing in the built environment; neither are there courses that focus on working with older adults nor courses on designing the built environment. A large educational gap was found in D4All courses and training in Slovenia at all levels and educational fields that were studied.

3.2. Stakeholder consultation

Within the scope of the work developed in DESIRE, several workshops were held with experts, policy makers, older adults and their caregivers and families. From the workshops conducted in Slovakia, it was possible to understand that most participants in all categories demonstrated a limited understanding about inclusive and accessible design, as well as the D4All theory and its implementation. Mostly, accessible housing solutions were seen as necessary, but only for the people who need them, and not as a preventive measure or a preparation that needs to be done after difficulties arise.

Regarding the older adult's perspective, the workshops conducted in Portugal aimed to highlight their most important needs in the living environment. The main outcomes were (1) comfort; (2) access to entrances of buildings or houses; (3) outdoor space or balconies and access to outdoor areas, such as walkways; (4) houses designed or retrofitted to ensure unrestricted accessibility, space and storage, white light and natural light, and good thermal conditions. These needs and wishes were summarised and considered when developing the training content for the DESIRE project.

In Slovenia, workshops were held with professionals responsible for physical and mental health in the built environment, such as architects, ergonomists, medical doctors, nurses, and psychologists. In these workshops it was pointed out that the interior design takes into account not only the needs of older adults as a specific group but also the unique needs of each individual. Regarding the absence of D4All topics in educational courses, the experts mentioned some reasons: (1) lack of accessibility culture due to insufficient knowledge; (2) lack of regulations or lack of consideration of the end user in the process; (3) persistence of outdated models related to accessibility or disability consideration; (4) lack of interest, commitment and preparation of teaching staff; and (5) in some cases where D4All is effectively applied in the classroom, there are also barriers for their visibility and their own identity.

4. Discussion

According to Larkin et al. (2016), "the implementation of universal design teaching into Architecture and Design curriculum has been recognised as an important step in facilitating and enhancing the uptake of universal design during the design process" (p. 1). Nevertheless, the present study points to various gaps identified in different countries, suggesting a need for developing training tools and materials on D4All

throughout Europe. These data are in line with what was already described in 2011, by İnalhan and Sungur, who reported that even though inclusive design is taught around the world, its integration into academic curricula is limited.

In Slovakia, there is insufficient information on D4All methods, and on the needs and requirements of people with disabilities or of different ages. As far as curricula are concerned, there is a lack of teaching materials in general (especially in secondary schools), and interactive teaching materials which could better engage students.

In Portugal, this gap exists at all levels of education, so there is a need to not only train teachers and adapt the curricula, but also invest in lifelong learning, especially for professionals in the construction and furniture sectors.

The lack of an accessibility culture due to ignorance, denial of needs, lack of regulations or lack of consideration of the end user is also evident in Spain. Undergraduate curricula generally do not include the principles of D4All. The good practices that were reported only exist where teachers had been previously involved or worked in another field where there was a legal obligation to follow the mentioned practices. But in general, teachers showed a lack of interest, commitment, or preparation in adopting these concepts, and maintained an inadequate approach focusing only on care and elimination of barriers.

In Slovenia, D4All courses are needed to train and educate designers, architects, construction professionals, and others involved in the design and construction process. There is also a need to implement basic ergonomic features such as proper design of chairs or kitchens, ensuring a safe and lighted path between bedrooms and toilets, and implementing features that promote mental and physical well-being through the built environment.

There are differences between the countries that were studied in terms of D4All provision. There are countries where D4All topics are broadly covered, while in other countries these topics are not yet available across all levels and fields of education. The results found in this study are in line with what was already reported by İnalhan and Sungur (2011) who found that, even in architectural courses, the topics of universal design and inclusive design were not sufficiently valued.

The main reasons for why D4All is not widely implemented are the lack of culture of accessibility, the use of outdated models for dealing with accessibility, lack of interest, or preparation of teaching staff; and in some cases where D4All concepts are applied in the classroom, there are also obstacles for their visibility and their own identity.

A previously published report prepared for the Council of Europe indicated that "half the countries in the overview have introduced universal design into the curricula of professions working on the built environment" (Ginnerup, 2009, p. 22); this shows that although it is slow, the effective implementation of these topics in teaching is already taking place.

5. Conclusion

IAs explained in the background section, the educational fields of architecture and design are more exposed to D4All, but these issues are also linked to medicine, social care, education, and other fields where professionals may deal with older adults or people with mobility difficulties.

Most of the countries do not have sufficient literature and other materials adapted to different educational levels, indicating that it is important to develop suitable study materials. In terms of teaching materials, most countries have identified a lack of literature and other materials adapted to different levels of education, so it is important to develop these types of teaching materials. Moreover, digital tools can further motivate students and increase efficiency of knowledge transfer (Ariana et al., 2016). Therefore, the use of virtual tours, videos with examples, or gamified platforms (empathic simulations) to place the students "in the shoes" of those who face difficulties in accessing public or private spaces, or even using objects, should be used while teaching D4All concepts. It is also necessary to include older adults or any citizens who wish to participate, and listen to what their needs and expectations are.

Although it is very important to adapt the educational curricula of secondary schools and universities, the changes that will come from these adaptations might take time to produce a real-life effect. Thus, in parallel with these changes in curricula, countries should invest in focused professional training. This kind of training, which is focused on the qualification of existing professionals through lifelong learning, is very effective and will have a larger impact on the implementation of good practices (Evans et al., 2013; Feng and Ha, 2016) and could speed up the use of D4All methods in practice.

As only four countries in the EU were studied, it is not possible to get a complete overview of how other countries implement D4All tools and methods, and in which fields and at which levels of education. Future studies could also expand on these findings by involving additional countries, developing a comprehensive overview, including greater sample sizes, and using a more rigorously conservative and structured methodology, that will allow for generalisation of the results.

Investing in D4All issues at different levels and in different fields of education is a way to improve the mental, physical and social health of all, and defend human rights and the rights of people with disabilities. As the population continues to age, D4All can be an anti-stigma tool in changing mentalities regarding social inclusion processes and supporting a healthy and successful ageing. It is becoming even more urgent to create spaces and objects that promote greater inclusion and participation of older adults in society by implementing a comprehensive approach to the design of built environments.

It is also important to implement a holistic approach and strategy for public health that considers older adults as unique individuals, with different but specific needs and requirements, who will benefit from personalised and inclusive products and services; namely, for the built environment, housing and furniture they use in their daily life.

The data presented enables an understanding of the levels and areas of training where it is important to improve the degree of implementation of D4All in age-friendly housing. With that aim the DESIRE project developed a training course, divided into six modules: (1) Introduction to inclusive and age-friendly environments; (2) Ageing process and design; (3) Age-friendly built environment/architecture; (4) Age-friendly built environment/interior; (5) Age-friendly Product Design; and (6) Product engineering. This training content was developed for implementation in VET programs and at the labour market level and will be available until the end of the year at https://desire.learning-platform.eu/.

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