

THE DEVELOPING DEFINITION OF UNIVERSAL DESIGN

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Abstract: A review of scholarly work indicates a shift in the definition of universal design. Originally, the focus was placed on physical access to the built environment through design innovations that, while small in scale, resulted in significantly improved outcomes. This has developed to a more contemporary vision that addresses issues of social justice across multiple strata. This development is an indicator of the evolution of the field and has significant implications for those teaching universal design.

In 2018, educators teaching in interior design programs accredited by the Council for Interior Design Accreditation (CIDA) in the United States were surveyed about the infusion of universal design content within their curricula. As part of the survey, participants were presented with four definitions and asked to assess their appropriateness in defining the term universal design. Responses revealed a generally high level of understanding regarding the definition of universal design. This article investigates the evolution of the definition of universal design, presenting each of the definitions in their historical context, presents the survey results of interior design educators' perceptions of these definitions, and concludes with implications for universal design, particularly in the interior design discipline.

Keywords: universal design, interior design, human-centred design

Introduction

Educators of interior design, particularly those within programs accredited by the Council for Interior Design Accreditation (CIDA), are responsible to address

a wide variety of topics designed to ensure students are prepared to enter the profession. CIDA makes this responsibility plain in the Preamble to their Professional Standards, stating that “a sound curriculum for professional interior design education must provide a balance between the broad cultural aspects of education, on the one hand, and the specialized practical content integral to the profession, on the other.” (Council for Interior Design Accreditation, 2018)

Consistent with their stated commitment to “the ongoing enrichment of the interior design profession through identifying, developing and promoting quality standards for the education of entry-level interior designers”, CIDA requires that accredited programs of interior design successfully address 118 topics across sixteen standards. (Council for Interior Design Accreditation, About CIDA, n.d.) Among these standards, the universal design is addressed in standard 7e: “Student work demonstrates the ability to apply human factors, ergonomics, and universal design principles to design solutions.” (Council for Interior Design Accreditation, 2018) Footnoted reference of this standard makes reference to the following definition of universal design attributed to Ronald Mace at North Carolina State University Center for Universal Design: “the design of products and environments to be useable by all people to the greatest extent possible, without the need for adaptation or specialized design.” It is worth noting that this footnote includes specific differentiation of universal design from accessibility standards in the United States and Canada. (Council for Interior Design Accreditation, 2018)

Interior design generally, and CIDA in particular, has a well-established historical connection to universal design as a concept, even before the term “universal design” had become definitively understood. As will be discussed in the next section, the earliest use of universal design as a defined term occurred in 1985 by Ronald Mace, although at that time, the term had not gained widespread adoption beyond its origins in disability advocacy (Mace, 1985). Even so, the Foundation for Interior Design Education and Research (FIDER), as the predecessor of CIDA, included “design for special populations including persons with disabilities” as a core competency required of students educated in interior design as early as 1988 (Maisel, Steinfeld, et al., 2018; Foundation for Interior Design Education and Research, 1996). In subsequent

iterations of the FIDER professional standards, terminology shifted toward the use of “universal accessibility,” placing interior design educators among the earliest adopters of this concept. FIDER accreditation standards have included the term “universal design” since the publication of Professional Standards 2000 (Council for Interior Design Accreditation, 2000). This shift in terminology can be attributed to the then-recently published *Seven Principles of Universal Design* in 1997 (Connell et al., 1997). FIDER would change their name to CIDA in 2006 (Council for Interior Design Accreditation, *Our Story*, n.d.)

In the intervening years, through the work of several scholars, attempts have been made to fully capture the essence of universal design, resulting in no fewer than six different definitions of the term. Far from being a detriment to the study of this field, the multiplicity of definitions is, in fact, a sign of a healthy, growing concept. In the *Handbook of Universal Design* (2001), contributor Molly Story indicates that:

Differing terminology is a sign of healthy engagement with the concept, of practitioners seeking wording that is useful for a variety of specific purposes. Regardless of wording, the goal is profound: we can and should make our human-made world as accessible and usable as possible for as diverse a user population as possible. (W. F. E. Preiser & Smith, 2011)

Background

Evolving Definitions of Universal Design

Globally, the concepts contained within universal design have been included under different terms. In the UK, for example, the term “inclusive design” is more commonly used than universal design (Clarkson & Coleman, 2015). “Design for all” is the preferred term by the Council for Europe and the European Commission, particularly in their centres of excellence initiatives (Ormerod & Newton, 2005). While there are regional differences in the terminology, the basic underlying concepts agree. Of the terms considered, universal design has the longest history and, therefore, the greatest

development in clarifying the language of the definition. Furthermore, universal design has the greatest adoption in the United States (W. F. E. Preiser & Smith, 2011), and this term has been incorporated into the accreditation standards of interior design, the specific field studied in this survey. Moreover, as this study was limited to CIDA accredited programs in the United States, exploration was focused on the specific term universal design.

In the United States, the earliest use of the concept that would become known as universal design is attributed to the work of Ronald L. Mace at the Center for Universal Design at North Carolina State University. The first official definition of universal design emerged in 1985 as follows:

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. (Mace, 1985)

Mace's definition refers broadly to the design of both industrial products and architectural space. Mace, though an architect, understood from the outset that the concept of universal design needed to embrace more than simply architectural space. This definition was later included in the 2006 UN Convention on the Rights of Persons with Disabilities (Sieberns, 2018).

In 1991, Mace, Hardie, & Place published a revised definition as follows:

designing all products, buildings and exterior spaces to be usable by all people to the greatest extent possible. (Mace et al., 1991)

To assist with the implementation and dissemination of the concept of universal design, ten cross-disciplinary researchers were assembled to establish an agreed-upon set of principles by which universal design could be assessed. The Seven Principles of Universal Design resulting from their work were published in 1997. (Connell et al., 1997)

Among the authors of the Principles of Universal Design was Gregg Vanderheiden, PhD. Shortly after the publication of the principles, Vanderheiden offered the following definition of universal design:

A process of creating products (devices, environments, systems, and processes) which are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions, and circumstances), as is commercially practical. (Vanderheiden & Tobias, 1998)

Whereas Mace viewed the role of universal design primarily through an architectural lens, Vanderheiden considered a different perspective as an expert in systems and user-interface design. It is therefore made clear in his definition that the concept of universal design applies not only to the built environment but also to “systems and processes.”

The mission and message of universal design continued to be refined in the following years. In 2001, Elaine Ostroff of the then-Adaptive Environments Center (now the Institute for Human Centered Design) published the *Handbook for Universal Design*, in which she presented the following definition:

Universal design is an approach to design that honors human diversity, addressing the right for everyone--from childhood into the oldest years--to use all space, products, and information in an independent, inclusive, and equal way. Further, the universal design process invites designers to go beyond building or access code compliance to create excellent, human-centered design. (W. F. E. Preiser & Smith, 2011)

It is clear from these definitions that the focus of universal design had already begun its evolution beyond a concept focused on specific design interventions and toward one focused on the needs of a diverse group of users.

Concurrently, researchers in the UK were evaluating the terminology and fitness of the various terms of universal design, inclusive design, and design-for-all. In 2005, Ormerod argued that the terms could be considered as interchangeable and offered a definition that sought to resolve these disparate terms into one definition:

Inclusive design is way of designing products and environments so that they are usable and appealing to everyone regardless of age, ability or circumstance, by working with users to remove barriers in the social,

technical, political and economic processes underpinning building and design. (Ormerod & Newton, 2005)

This definition would proceed to be adapted by the United Kingdom Design Council, where it was officially adopted in 2008.

[Inclusive design] is a general approach to designing in which designers ensure that their products and services address the needs of the widest possible audience, irrespective of age or ability. Two major trends have driven the growth of Inclusive Design (also known [in Europe] as Design for All and as Universal Design in the USA) - population ageing and the growing movement to integrate disabled people into mainstream society. (Design Council, 2008, referenced in Clarkson & Coleman, 2015)

It is notable that while the Ormerod & Newton definition clearly continues the trend of considering a human-centred design approach, the official UK Design Council definition, though published afterwards, maintains language consistent with a disability-focused agenda. This can be contrasted with the following definition published the same year by Beth Tauke, professor and researcher at the University at Buffalo School of Architecture and Planning:

Inclusive design is socially focused and grounded in democratic values of non-discrimination, equal opportunity, and personal empowerment. (Tauke, 2008)

Here Tauke removes traditional explicit references to the built environment, products, systems, and processes, that figure prominently in previous definitions, and opts instead for a values-based approach. If a design process of any variety is socially focused, non-discriminatory, and addresses equality of opportunity and personal empowerment, Tauke argues, it should be considered inclusive (or universal) design. Contrasting this approach with the initial Mace definition from two decades prior, it is evident that the movement of universal design has transitioned beyond the responsibility of designers of the built environment to a much wider set of designers, thinkers, and practitioners.

A final recent notable definition continues the trend of addressing issues of diversity and personal empowerment as foundational components of the concept of universal design.

A design process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation. (Steinfeld & Maisel, 2012)

This definition, consistent with its predecessors in emphasizing design as a process, also emphasizes the importance of the outcomes of this process. This suggests the possibility of an assessment tool that can evaluate the outcomes in areas of human performance, health and wellness, and social participation, which will indicate the relative success of a universally designed process. From this definition, it can therefore be asserted that if a design does not sufficiently improve human performance, health, wellness, and social participation, it is not considered universal.

A trend is evident in the development of these definitions, which expands from specific design intervention as exemplified by Mace's 1985 definition toward an approach that inspires more empathy on the part of the designer. The trend invites this question: Is the role of the universal design practitioner to suggest modest and incremental improvements to the built environment, or is it instead to replace the process that results in traditional designs and built works with one that starts with embracing human diversity and wellbeing?

Universal Design in Interior Design Education

The development of the definition of universal design has occurred in parallel with the development of the professional standards by which interior designers in CIDA-accredited programs are trained. Interior design educators have been working to include universal design content in their curricula from the earliest days of the concept. This is due in large part to the influence that accreditation standards have played. FIDER and later CIDA have both included requirements for programs seeking accreditation to address the concepts of universal design in varying forms and under multiple terms.

Professional Standards 2000 (Council for Interior Design Accreditation, 2000)
Standard 6l consisted of the following language:

Student work MUST demonstrate understanding of universal design concepts and principles. (Council for Interior Design Accreditation, 2000)

While this was the first time that direct reference to the specific term “universal design” was included in the interior design accreditation standards, the standards in force immediately prior were FIDER 402R, dated January 1996. While 402R did not include the language of universal design, it is evident that the authors were aware of the movement as the standard includes “universal accessibility guidelines” in standard S2.11.3 as an example of standards and regulations with which students must be familiar (Foundation for Interior Design Education and Research, 1996, p.9).

In contrast, interior design’s most closely allied field, architecture, is accredited by the National Architectural Accreditation Board (NAAB). To date, NAAB has not included language indicating the importance of inclusive or universal solutions in their published Procedures for Accreditation, even as recently as 2015. Standard B.2 of this document, titled Accessibility, indicates that students must demonstrate the

Ability to design sites, facilities, and systems to provide independent and integrated use by individuals with physical (including mobility), sensory, and cognitive disabilities. (National Architectural Accreditation Board, 2015)

While this embraces the partial spirit of universal design, the focus of this standard is explicitly placed on disabilities. In concept, this is most closely aligned with a code-based minimum requirement definition. Absent is the concept of design for all.

Methodology

Survey Responses to Definitions of Universal Design

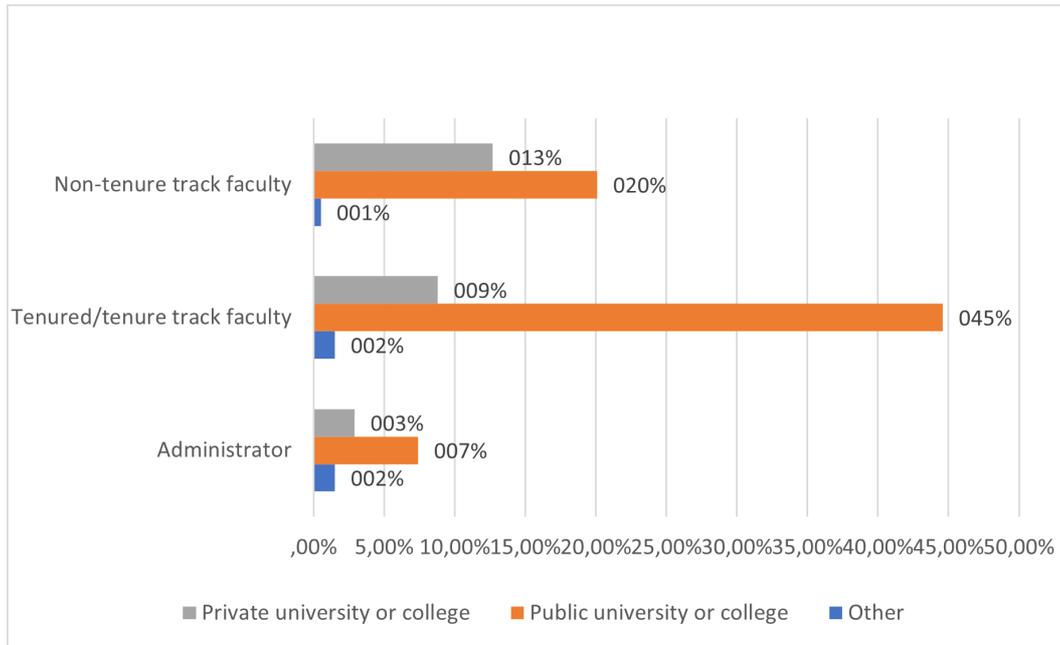
Because of the extended history of interior design with universal design, researchers were interested in the degree to which accredited interior design programs in the United States were achieving the CIDA-prescribed requirement. This was investigated through an online survey distributed to faculty and administrators in 158 CIDA accredited interior design programs throughout the United States in 2018. The survey procedures and content were similar to a previous survey sent to accredited Architecture programs (Tauke et al., 2016). The survey sought both quantitative and qualitative information, which asked about the understanding, attitudes, and incorporation of universal design in their curriculum. The following information provides additional information about the respondents.

Fig 1. Respondents who identified their school represented all five regions identified by the Interior Design Educators Council (IDEC).

<i>IDEC Region</i>	East	Midwest	Pacific West	South	Southwest	Region not provided	Total n
Sample size	24	45	22	42	27	93	253

Respondents were also asked to describe their primary title within their department and the type of institution in which the CIDA accredited program resides. Figure 2 below shows the responses provided by the 204 respondents who provided both title and institution type.

Fig 2. Respondent's Title and Institution Type: Percentage of the total sample (n=204)



Among the many topics related to universal design that were investigated through this survey, researchers were interested in examining faculty understanding of the concept of universal design. The findings of this topic are the particular focus of this paper and are expanded below.

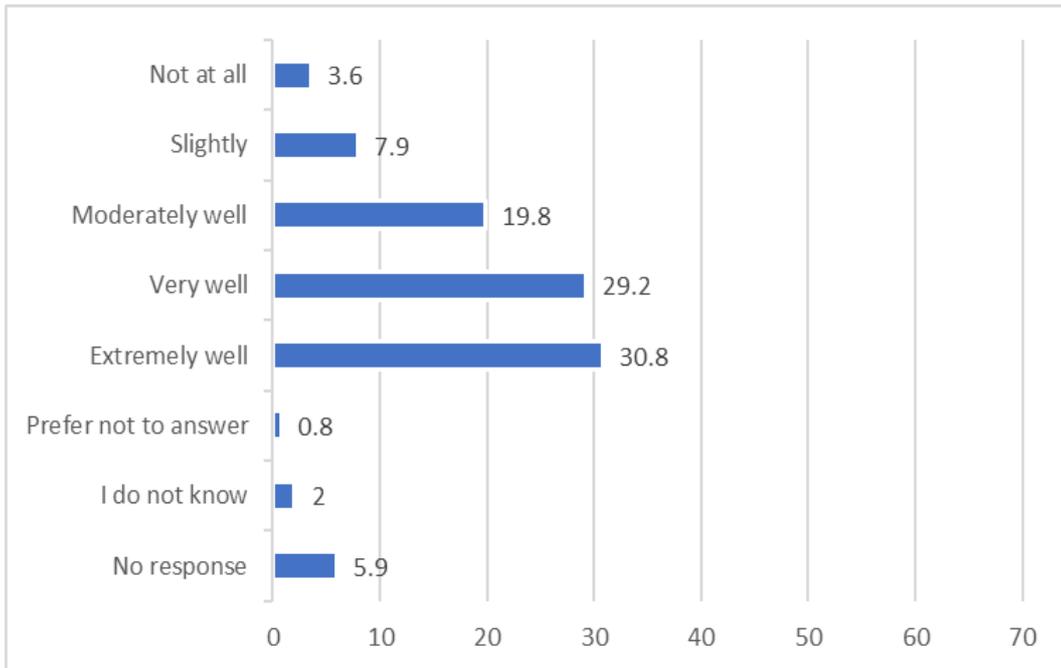
Survey respondents were presented with four definitions and asked “How well does this statement describe the term ‘universal design?’” Definitions 1, 3, and 4 were drawn from a historical context within the universal design movement, as discussed previously, whereas definition 2 was presented as a foil. All definitions were presented without context; survey participants were not provided with any background information for each definition.

Definition 1 as presented in the survey was the 2008 definition by Tauke

Inclusive design is socially focused and grounded in democratic values of non-discrimination, equal opportunity, and personal empowerment.

The responses to this definition by Tauke (2008) (Fig 3) indicate that faculty believe this definition to be an adequate definition of universal design. Sixty percent of respondents indicated that this definition fits the concept very well or extremely well, with only 11.5% indicating that it met the definition slightly or not at all.

Fig 3. Definition 1: A socially focused design process grounded in democratic values: Percent agreement (n=253)



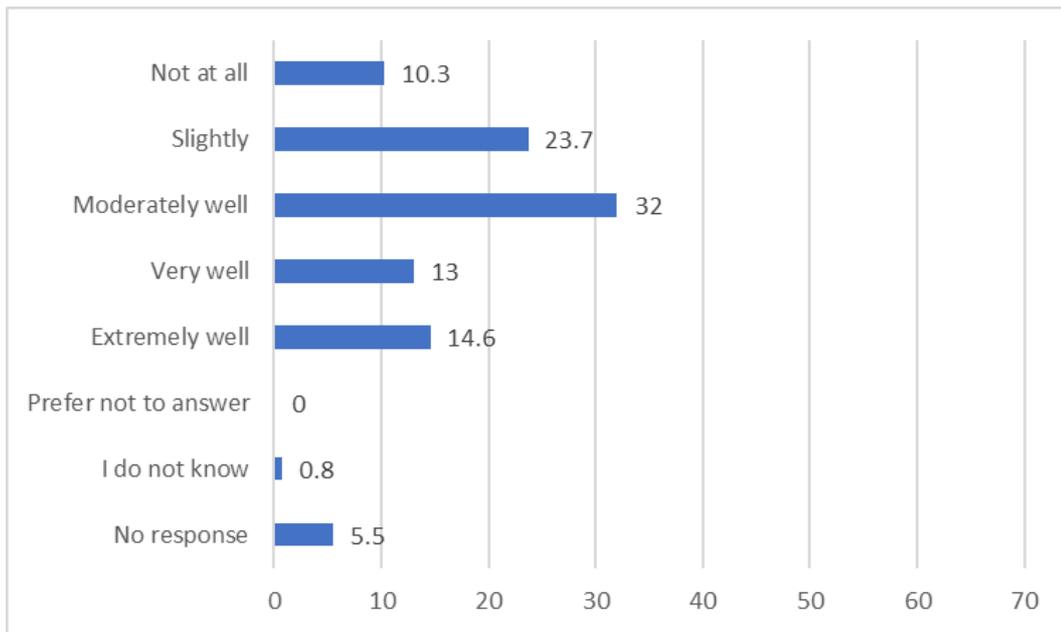
Definition 2 presented in the survey was adapted by the researchers from the 2010 Standards for Accessible Design by the United States Department of Justice. The definition published in the standards reads as follows: “minimum requirements - both scoping and technical - for newly designed and constructed or altered state and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.” (United States Department of Justice, 2010). The definition presented in the survey distilled the essential concepts and presented the following adapted definition

The design of interior and exterior environments to meet prescribed requirements for people with disabilities.

This definition was included as a foil. It places emphasis on access for people with disabilities which, as discussed above, is an incomplete perspective from the standpoint of universal design. Interior design educators predominantly recognized this, with 27.6% indicating that this definition described universal design very well or extremely well, 32% indicated a moderate response, and 34% indicated slightly or poorly (Fig 4). Researchers were interested in investigating some possible reasons that the responses were not skewed even more dramatically and so cross-referenced the responses with demographic

questions. Those responses indicating that definition 2 fit the concept very well or extremely well were predominantly part-time instructors. Possible reasons were discussed amongst researchers for this, including professionals who are daily steeped in building code language or a lack of professional sensitivity to the development of the definition of universal design. The collected data did not indicate any further depth on this issue, and it remains an open question for further study.

Fig 4. Definition 2: Design of environments to meet requirements for people with disabilities. Percent agreement. (n=253)



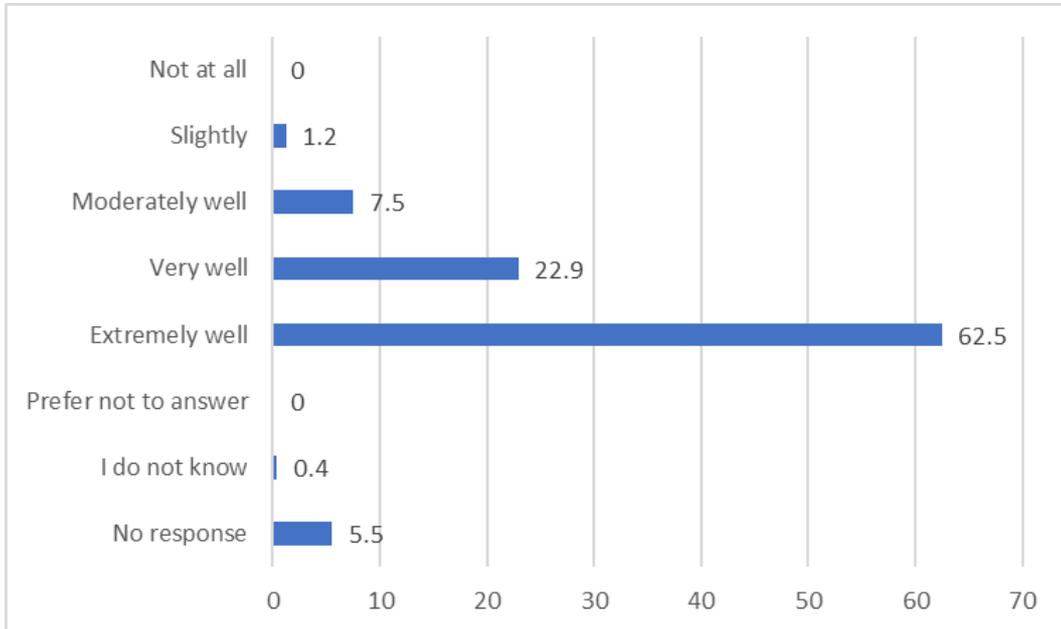
Definition 3, as presented to respondents, was an adaptation of the 1991 Mace definition discussed above. As published by Mace, this definition reads as follows: “designing all products, buildings and exterior spaces to be usable by all people to the greatest extent possible.” (Mace et al., 1991). The adapted definition as presented in the survey read as follows

The design of products, information, environments, and systems to be usable to the greatest extent possible by people of all ages and abilities.

Considered a classic definition in the field, researchers anticipated that many respondents would find this definition a strong fit to the concept. As expected, respondents strongly indicated that this definition represents the term universal design, with 85.4% indicating that it describes the term very

well or extremely well. Only 1.2% indicated that this definition slightly describes the term universal design, and no respondents indicated that this definition was fully unfit to describe the concept (Fig 5).

Fig 5. Definition 3: Design of products, information, environments to be usable by all. Percent agreement. (n=253)

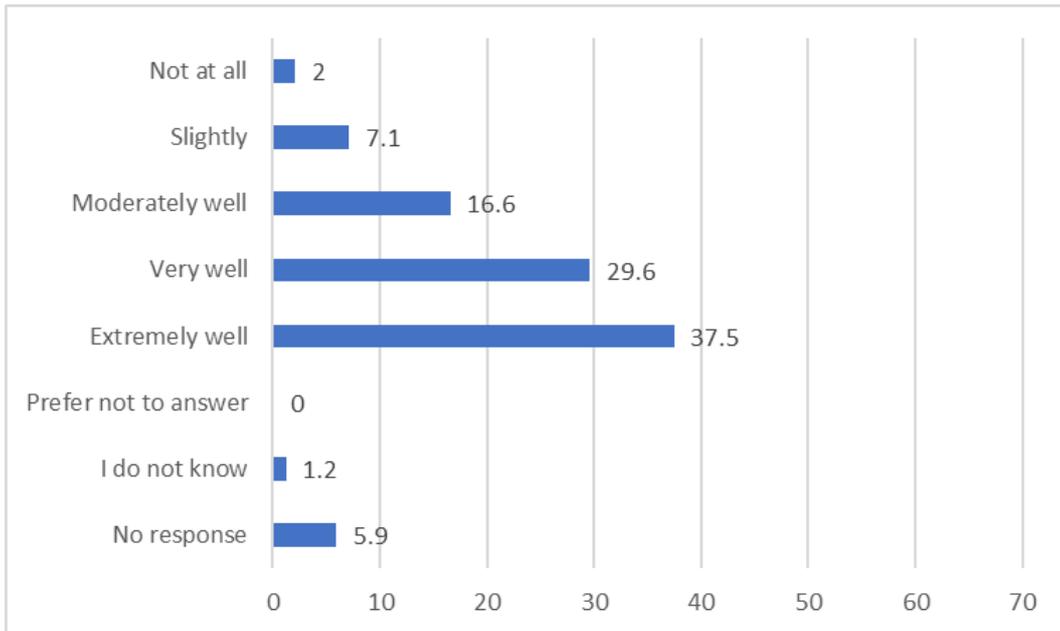


Definition 4 presented in the survey was published by Steinfeld and Maisel in 2012, making it the most recently published definition. The definition as presented in the survey reads as follows:

A design process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation.

Respondents generally agreed that this definition represents the concept of universal design, as 67.1% of respondents indicated that this definition describes the term universal design very well or extremely well. Only 9.1% indicated slightly or not at all (Fig 6).

Fig 6. Definition 4: A design process that enables and empowers a diverse population. Percent agreement. (n=253)



Conclusion

A key finding resulting from this investigation is that interior design educators have a good understanding of the term ‘universal design.’ Of the definitions provided, respondents accurately identified the three that are part of the developing definition of universal design as discussed previously, though there remains some concern as to the ambiguous responses received for the disability-focused definition 2 (Fig 4). This could be an indication that further instructor education in this area is needed. Further study of this issue should be undertaken. Among the definitions that are included in the developing definition of universal design, more recent definitions 1 (Fig 3) and 4 (Fig 6) do not yet appear to be as readily recognizable to educators as is definition 3 (Fig 5), which is acknowledged to be a classic in the field. This may be a result of educators understandably relying on tried-and-true course materials, but may also indicate a need to update curricular offerings.

Although it is not possible with this data to ascertain the degree to which CIDA accreditation standards have influenced the high level of faculty familiarity with the concepts of universal design, it is likely that requiring this content in the documentation for programs seeking accreditation is a contributing factor.

In contrast, faculty in a similar study of NAAB accredited architecture programs showed a lower general understanding of the topic (Tauke et al., 2016).

The continuing evolution and development of the concepts surrounding universal design indicate that the importance of access and human dignity promoted by universal design are enduring concerns of the built environment. Far from a settled discussion, universal design is an evolving concept which should be tested and refined in its application to endeavours in both academy and practice. As concluded by Mace in 1991 “For the technologies of universal design to fully develop, universal design concepts and methods must be taught in university design programs.”(Mace et al., 1991) It appears from this data that instructors in interior design have embraced this message.

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References

- [1] Clarkson, J. P., & Coleman, R. (2015). History of inclusive design in the UK. *Applied Ergonomics*, 46(PB), 235-247. <https://doi.org/10.1016/j.apergo.2013.03.002>
- [2] Connell, B. R., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E., Sanford, J., Steinfeld, E., Story, M., & Vanderheiden, G. (1997). *The Principles of Universal Design*. North Carolina State University, The Center for Universal Design. https://projects.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm
- [3] Council for Interior Design Accreditation. (n.d.) About CIDA. Retrieved February 17, 2020, from <https://www.accredit-id.org/mission>
- [4] Council for Interior Design Accreditation. (n.d.) Our Story. Retrieved February 17, 2020, from <https://www.accredit-id.org/cida-history>

- [5] Council for Interior Design Accreditation. (2018). Council for Interior Design Accreditation Professional Standards 2018. https://accredit-id.org/wp-content/uploads/2018/01/Professional-Standards-2018_Final.pdf
- [6] Council for Interior Design Accreditation. (2000.) Council for Interior Design Accreditation Professional Standards 2000.
- [7] Foundation for Interior Design Education and Research. (1996). FIDER 402R. In FIDER Accreditation Manual.
- [8] Interior Design Educators Council. (n.d.) IDEC Regions. Retrieved March 8, 2021, from <https://www.idec.org/i4a/pages/index.cfm?pageid=3292>
- [9] Mace, R. (1985, November). Universal Design: Barrier Free Environments for Everyone. *Designers West*, 147-152.
- [10] Mace, R., Hardie, G. J., & Place, J. P. (1991). Accessible Environments: Toward Universal Design. In W. E. Preiser, J. C. Vischer, & E. T. White (Eds.), *Design Intervention: Toward a More Humane Architecture* (pp. 155-176). Van Nostrand Reinhold.
- [11] Ormerod, M. G., & Newton, R. A. (2005). Moving beyond accessibility: The principles of universal (inclusive) design as a dimension in nD modelling of the built environment. *Architectural Engineering and Design Management*, 1(2), 103-110. <https://doi.org/10.1080/17452007.2005.9684587>
- [12] Preiser, W. F. E., & Smith, K. H. (2011). *Universal Design Handbook*. In W. F. E. Preiser & K. H. Smith (Eds.), McGraw Hill (2nd ed.).
- [13] Sieberns, A. (2018). Universal Design and Human Rights: The UN Convention on the Rights of Persons with Disabilities (CRPD). In IFLA (Ed.), *IFLA WLIC 2018 - Kuala Lumpur, Malaysia - Transform Libraries, Transform Societies* (Issue August, pp. 1-5). IFLA. <http://library.ifla.org/id/eprint/2269>
- [14] Steinfeld, E. & Maisel, J. (2012). *Universal Design: Creating Inclusive Environments*. New York. Wiley.
- [15] Tauke, B., Basnak, M, & Weidemann, S. (2016) Issue 2, *Nordic Journal of Architectural Research*, pp. 139-162.
- [16] Tauke, B. (2008). "Universal design - The time is now." in *Usability in Asia*, Li C. (ed.) Apogee.
- [17] United States Department of Justice. (2010). 2010 ADA Standards for Accessible Design. Title II. <https://www.ada.gov>.

- [18] Vanderheiden, G., & Tobias, J. (1998). Barriers, Incentives and Facilitators for Adoption of Universal Design Practices by Consumer Product Manufacturers. Proceedings of the Human Factors and Ergonomics Society 42nd Annual Meeting, 584-588.

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