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Evolving Design Pedagogies: Broadening Universal Design for Social Justice

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Abstract

Universal Design is often understood as a process for creating accessible environments for people with disabilities and aging populations. More recently, thought leaders and practitioners are exploring Universal Design beyond accessibility as a strategy to inform inclusive environments for "all groups that have been excluded from full participation" in society (Steinfeld and Maisel 2012, 41). This article explores the current state of academic and practice-facing Universal Design pedagogies to understand how existing frameworks and education approaches support the movement's expansion to address inclusion for increased demographic groups, in addition to people with disabilities and aging populations. Key challenges facing Universal Design pedagogies will be shared along with recommendations for repositioning Universal Design for social justice. Critical audiences for this work include architectural educators, students, researchers, policymakers, and building professionals interested in advancing the theory and practice of Universal Design.

Keywords: Universal Design, inclusive design, social justice, accessibility.

1. INTRODUCTION

Design pedagogies, particularly as seen in architecture programs, are often rigorously structured and steeped in tradition. For architects, topics of accessible design regularly focus on building codes and federal accessibility requirements established decades ago, without engaging emerging and more modern pathways for creating inclusive environments. Universal Design has been suggested as a remedy to this narrow focus on accessibility in both academics and practice (Mortice n.d.), framed as a broad process that can truly inform inclusive buildings designed for all (Mace, 1985). Rooted in human factors research, Universal Design primarily centers on supporting human performance through accessible and usable environments for people with disabilities and aging populations (O Shea et al., 2018; 721; Steinfeld et al., 2012). More recently, scholars and thought leaders are broadening the application of Universal Design frameworks to address inclusion for demographics beyond age and disability. These newer schools of thought position Universal Design as a strategy to inform inclusive environments for "all groups that have been excluded from full participation" in society (Steinfeld et al., 2012, p. 41) based on culture, religion, gender, language, LGBTQ+ identity, disability, and other intersectional and individual identities (Daniels and Geiger 2010; Myers and Crockett 2012; Sandhu 2002; Steinfeld and Maisel, 2012, 51-52; USGBC 2019). It is posited that broadening Universal Design to encompass additional demographic groups positions the movement to impact issues of social justice (Steinfeld et al. 2012, 41, 51-52).

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This article explores the current state of academic and practice-facing Universal Design pedagogies to understand how existing frameworks and education approaches support the movement's expansion to address inclusion for increased demographic groups, in addition to people with disabilities and aging populations. Recommendations from this work support repositioning Universal Design pedagogies to address a wide range of discriminatory barriers in the built environment and, in turn, advance social justice by creating more inclusive buildings, spaces, and communities. This deeper dive is timely as interest in Universal Design continues to rise. Key audiences for this work include architectural educators, students, researchers, policymakers, and building professionals interested in advancing the theory and practice of Universal Design.

UNIVERSAL DESIGN OVERVIEW

Parallel to the Disability Rights Movement of the 1960s and 70s in the United States, Ronald L. Mace, an architect with a disability and leader in the Barrier-Free movement, was spearheading a separate initiative calling for increased levels of access for people with disabilities. Mace coined the movement "Universal Design" in 1985 as "a way of designing a building or facility, at little or no extra cost, so it is both attractive and functional for all people, disabled or not" (Mace, 1985) As a movement, Universal Design has played a critical role in advancing inclusive environments, programming, and products for people with disabilities in the United States and worldwide. While the passage of legislation such as the Architectural Barriers Act (1968), Section 504 of the Rehabilitation Act (1973), the Fair Housing Amendments Act (1988), and the Americans with Disabilities Act (ADA) (1990) was a step forward, many disability rights advocates argued that the newly promulgated regulations did not sufficiently address integrated spaces for people with wide-ranging disabilities. Indeed, the most comprehensive federal accessibility regulations outlined by the ADA were based on "minimum guidelines" focused predominantly on accommodating people who use wheelchairs or assistive devices (Salmen 2011, 6.1-6.5). Additional challenges with adopting federal accessibility regulations arose, particularly from building professionals discouraged by added layers of restrictions (Crosbie 2018, 1-31) and attitudes framing accessible design as "stigmatizing and costly" (Story 1998, 4). Gaps in federal regulations opened the door for Universal Design, which was lauded as a more approachable movement aimed to reframe accessibility as smart design.

The concept of Universal Design came into prominence largely as a successor to the ADA, advocating for expanded notions of accessibility beyond baseline codes and standards. Universal Design has since served a critical need in the post-ADA era given its position as a non-mandatory pathway for creating accessible spaces that are both aesthetically pleasing and usable "by all" (Story 1998, 4). By promoting functional, inclusive, and beautiful environments designed for everyone, Universal Design was framed as a solution to address the criticized gap in federal regulations and destigmatize negative attitudes around accessible design. Today, federal accessibility regulations remain essentially unchanged from those passed decades ago, further securing the need for Universal Design.

The application of Universal Design is frequently explored through the demographics of end-users or "beneficiaries" of accessible and usable design strategies; most notably these groups include people with disabilities and aging populations (Steinfeld and Maisel 2012, 49). In *Universal Design: Creating Inclusive Environments*, Edward Steinfeld, an early proponent of Universal Design, and Jordana Maisel (2012) champion the idea that Universal Design can expand more broadly across additional demographic groups (51, 69), working toward social justice.

Specifically, Steinfeld and Maisel (2012) state:

> Although universal design does have strong roots in the disability rights and design for aging movements, it is important to look beyond traditional disability and aging statistics when studying the target population [for universal design], especially if we wish to consider the dynamic nature of modern societies that are experiencing vast socioeconomic shifts and rapid technological and economic changes. Universal design goals are better realized if designers understand the needs and preferences of a wide range of groups. (51)

As mentioned above, Steinfeld and Maisel further liken such extensions of Universal Design as a strategy for advancing social justice: "Although initially focused on disability rights, Universal Design can focus on any civil rights issue because ultimately design for diversity is concerned with social justice for all" (40).

Examples of additional demographic groups that can benefit from Universal Design include caregivers, people with emotional health issues, people who are neurodiverse, racial and ethnic minority groups, low and middle-income populations, and culturally-displaced persons (Steinfeld et al. 2012, 51-52).

Today, there exists a growing pool of scholars and thought leaders who are similarly exploring Universal Design to advance inclusive environments across culture, religion, gender, language, LGBTQ2+ identity, disability, and other intersectional and individual identities (Daniels and Geiger 2010; Myers and Crockett 2012; Sandhu 2002; Steinfeld and Maisel, 2012, 51-52; USGBC 2019). However, extensions of Universal Design across wide-ranging demographic groups are still limited. To ensure a successful path forward for expanding applications of Universal Design, it will be critical for educators, scholars, thought leaders, and practitioners to embrace new iterations of the movement. Universal Design's evolution toward social justice – or application across increased demographic groups – is an emerging concept that is particularly worth exploring in architectural education, as pedagogy is the driver of knowledge for future practitioners. It is necessary to understand how current Universal Design academic and practice-facing pedagogies address increasing themes of social justice – both for people with disabilities and aging populations, and beyond. Efforts to weave together vast amounts of literature on Universal Design pedagogies through a broader social justice lens have not been found; this article aims to help address this gap.

UNIVERSAL DESIGN PEDAGOGIES

Equally important to understanding the background and tenets of Universal Design is exploring how Universal Design is taught to students and practitioners. Pedagogies are ways in which we teach, learn, and proliferate ways of doing something. Pedagogical frameworks can be defined as, "The integrated set of philosophical considerations, teaching preferences, and learning values that informs and motivates the instructor in designing and facilitating a learning experience" (Starr-Glass 2022). In the complexity of architecture, pedagogy must combine technical skills with soft skills of design; materials, building systems, and structures must be complemented with theory, history, and design thinking (Jindal n.d.). Today, Universal Design is proliferated through varying pedagogies in both architectural education and practice, including formal and continuing education curriculum, teaching methods, practitioner frameworks, and building performance rating standards.

Education Curriculum

Efforts to adopt course curriculum on Universal Design in formal architectural education have been largely decentralized. One exception is the Universal Design Education Program (UDEP), which ran in a limited capacity from 1993 to 1996. This initiative was supported by the National Endowment for the Arts and the United States Department of Justice and aimed to support faculty teachings on Universal Design across architecture, industrial design, interior

Table 2. Most prevalent Topics and User groups addressed in Universal Design CPD (In order).

	UD Topic	Population Groups
1	Building Types	Older People
2	User-centred design	Cognitive difficulties
3	Building elements	Visual difficulties
4	Wayfinding	Mobility difficulties
5	Building systems	Mental difficulties
6	Urban design	Children
7	Conservation	Gender related difficulties
8	Site design	Hearing difficulties
9	Transport	Manipulation difficulties
10	Landscape	Carers
11	Natural heritage	
12	Usability	
13	Signage	

Table 1. Findings from a study conducted by O Shea et al. outline aging populations and people with disabilities as the most prevalent user groups addressed in practice-facing Universal Design curriculum (Image Source: O Shea et al. 2018, 722).

design, and landscape architecture programs at 22 colleges and universities (Fletcher et al. 2013, 268). In the early 2000s, Universal Design courses were periodically taught in higher education design programs at North Carolina State University (Story 2002, 243-267) and the University of Cincinnati (Preiser 2002, 217-240); however, neither course appears to be presently offered. A review of the curriculum for these courses confirmed a direct focus on disability inclusion as the dominant goal of Universal Design.

Despite the lack of centralized efforts to promote Universal Design education, research suggests that educators have positive attitudes toward teaching Universal Design (Basnak et al. 2015, 676; Lombardi and Murray 2011). This receptiveness was corroborated in practice-facing education by researchers exploring Universal Design themes across 126 Continuing Professional Development (CPD) programs in 10 countries, including the United States (O Shea et al. 2018). Findings showed that architectural educators and practitioners have a desire for both more curriculum and deeper knowledge around Universal Design. The study also confirmed that Universal Design course content predominantly focused on aging populations and people with disabilities (Table 1) and that participants cited an interest in more information regarding the needs of other demographic groups (722). Without a structured and more inclusive approach, Universal Design in formal and practice-facing architectural education will continue to fall short of both the needs and preferences of architecture practitioners, students, faculty, and administrators.

Teaching Methods

With limited organization around developing Universal Design curriculum, it is unsurprising that Universal Design teaching methods for students and practitioners are varied and, at times, subject to debate. Like education curriculum, teaching methods for Universal Design are seemingly centered on disability inclusion as the primary goal. In the book *Universal Design: 17 Ways of Thinking and Teaching* (Christophersen 2002), more than 20 subject matter experts lend their guidance and opinions on best practices for proliferating the theory and practice of Universal Design. One central theme unanimously agreed on by the authors of these essays involves end-users with disabilities as "expert consultants" to inform design (11). However, the suggested level and type of engagement with end-users varies across the discipline. While some argue that end-users must be physically involved in "materially shaping design outcomes" through participation (Jones 2014, 1372), others support the experiential involvement of end-users in education delivery as lecturers, interviewees, and general informants of their own lived experiences (Story 2002, 243-268).

Often a point of contention (O Shea et al. 2018, 724), "simulation exercises" in which students assume a disability for a limited period of time are also popular methods for teaching Universal Design in both the classroom and practitioner workshops (Ryhl 2018). Proponents believe simulation exercises can help students build empathy based on short-lived experiences (Christophersen 2002, 11). Other experts contest that arbitrarily altering abilities at random will never replicate the true lived experiences of people with disabilities, who often develop alternative skill sets over time spent navigating their world (Costanza-Chock 2020, 84). Additional research corroborated these challenges, finding that simulation exercises did not increase participants' ability to think reflectively about their own experiences and involvement with Universal Design (Guimaraes 2006). As applications of Universal Design across demographic groups continue, new methods should be considered for teaching the theory and practice of Universal Design in both academic and professional settings.

Frameworks

Practice-facing frameworks, in addition to academic pedagogies, are a critical method for sharing and educating on Universal Design history, theory, and application. The first comprehensive set of Universal Design guidelines for building professionals was developed in 1997 by Mace and a consortium of experts at the Center for Universal Design at North Carolina State University. With funding from the National Institute on Disability and Rehabilitation Research (NIDRR), the group of interdisciplinary leaders identified the Seven 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; and 7) Size and Space for Approach and Use (Mace et al. 1997) (Table 2). Given the team's deep expertise and nuanced understanding of accessibility compliance challenges, the Seven Principles underscore goals of accessibility and usability as fundamental concepts of Universal Design. The Seven Principles have been adopted as the seminal framework for practitioners and educators interested in Universal Design and are reflected in academic coursework (Preiser 2002, 217-240; Story 2002, 243-

Seven Principles of Universal Design
Principle One: Equitable Use The design is useful and marketable to people with diverse abilities.
Principle Two: Flexibility in Use The design accommodates a wide range of individual preferences and abilities.
Principle Three: 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.
Principle Four: Perceptible Information The design communicates necessary information effective to the user, regardless of ambient conditions or the user's sensory abilities.
Principle Five: Tolerance for Error The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Principle Six: Low Physical Effort The design can be used efficiently and comfortably and with a minimum of fatigue.
Principle Seven: 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.

Table 2. The Seven Principles of Universal Design and associated guidelines as authored by Mace et al. (1997). (Image Source: Authors).

267), textbooks (Herwig and Bruce 2008; Null 2014), case studies (Story et al. 1998), and design guidelines worldwide (BCA 2016; Levine 2003).

The Seven Principles continue to serve as the dominant framework for practicing Universal Design. However, in 2012, Steinfeld and Maisel introduced this updated definition of Universal Design: "A design process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" (2012, 29). In support of this new vision, Steinfeld and Maisel also identified the Eight Goals of Universal Design: Body Fit, Comfort, Awareness, Understanding, Wellness, Social Integration, Personalization, and Cultural Appropriateness (90) (Figure 3). Not meant to replace the Seven Principles, the Eight Goals are an additional framework intended to both clarify and expand existing Universal Design approaches. Specifically, the Eight Goals aim to: 1) supplement usability and accessibility priorities of the previously established Seven Principles, and 2) extend Universal Design to address aspects of wellness, performance, and social integration (2012, 90). Together with the Seven Principles, the Eight Goals reinforce disability inclusion as a priority for Universal Design while also encouraging a broader reach across expanded demographic groups. Despite a clear need for the Eight Goals to inform emerging Universal Design efforts, the framework still appears largely underutilized by practitioners, educators, and researchers. Regardless, the Eight Goals should be considered and adopted across all Universal Design pedagogies.

Building Performance Standards

Global building performance standards are used to bring structure to large design initiatives while marketing the achievement of design goals through building certifications. As such, building performance standards have become one of the primary roadmaps for innovative design in the built environment, and are often used in education to help structure complex processes for future practitioners (Rider 2019). While demands for social justice continue to rise around the world, Universal Design is emerging as a trend in several popular building performance standards such as

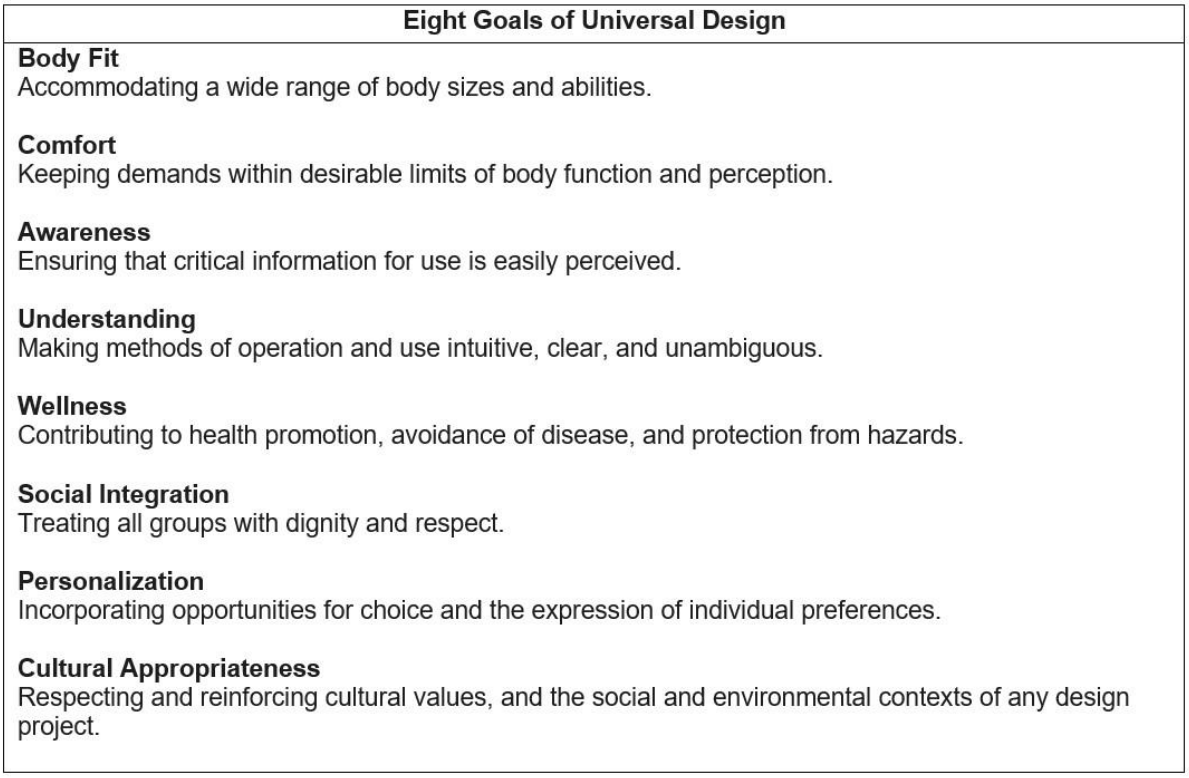

Figure 1. The Eight Goals of Universal Design as authored by Steinfeld and Maisel (2012). (Image Source: Authors).

the WELL Building Standard, Leadership in Energy and Environmental Design (LEED) rating system, the Living Building Challenge, and Enterprise Green Communities. Despite this significant progress, adoption of these often optional Universal/Inclusive Design pathways likely remains low.

The development of building performance standards is quite decentralized, with separate organizations setting their own agendas and ideas on how to best address challenges and priorities in the built environment. As a result, while building performance standards do share many commonalities at a broad level, the pathways, point systems, and certification levels can vary significantly. This is the case with Universal/Inclusive Design standards outlined in WELLv2, LEED v2, Enterprise Green Communities, and the Living Building Challenge. While some commonalities exist, variances include differences in terminologies (i.e., Inclusive vs. Universal), strategies, and pathway options (Table 3). It should also be noted that none of the building performance standards expressly cite the Seven Principles or Eight Goals as a sole strategy for securing points, positioning building performance standards as a departure from dominant Universal Design frameworks. In line with other Universal Design pedagogies, a review of each standard confirmed an emphasis on disability inclusion and aging populations. If positioned appropriately, building performance standards can be an effective platform for elevating reconceptualized models of Universal Design.

KEY CHALLENGES

This article seeks to understand how current academic and practice-facing Universal Design pedagogies are supporting the movement's expansion across increased demographic groups to, in turn, advance social justice. There are a number of key challenges related to Universal Design pedagogies to consider when exploring this topic: 1) compartmentalized delivery of Universal Design curriculum; 2) a narrowed focus on accessibility and usability as primary goals of Universal Design; 3) the lack of operationalized Universal Design strategies; and 4) the universalism of Universal Design. Each of these challenges is discussed in more detail below.

Building Performance Standard	Universal/Inclusive Design Standard	Pathway Options/ Requirements
WELL v2	Feature C13: Accessibility and Universal Design	Optional (optimization) feature worth 2 points towards WELL Certification.
LEED v4	Inclusive Design Pilot Credit	Optional credit worth 1 point towards LEED certification.
Enterprise Green Communities	7.12. Beyond ADA: Universal Design	Optional pathway worth up to 8 points towards certification.
Living Building Challenge	Equity Petal: Core Imperative 17 - Universal Access	Required to achieve Equity Petal Certification.

Table 3. Universal/Inclusive Design Standards and Pathway Options/Requirements from WELLv2, LEEDv4, Enterprise Green Communities, and the Living Building Challenge (IWBI n.d.; USGBC 2019; Enterprise 2020; ILFI 2019). (Table Source: Authors).

1. Compartmentalized Delivery

There are significant gaps in Universal Design pedagogies across architectural education and practice that must be addressed, even before reframing the movement toward social justice. Universal Design is rarely incorporated holistically into design education. Instead, Universal Design is often a secondary addition to courses that is "injected" in a singular moment, possibly as a one-unit credit or one-time daylong workshop (Basnak et al. 2015, 672). The lack of focused attention on Universal Design curriculum is particularly concerning because of fundamental misunderstandings and subjective interpretations around Universal Design and like-minded efforts. The connections between accessibility and Universal Design, for example, are so pervasive that there is significant confusion between these approaches among architecture professionals and educators (Persson et al. 2014). Additionally, while slight but important nuances exist between Universal Design, Inclusive Design, Design for All, and Barrier-Free Designs, scholars and practitioners often adopt one representative umbrella term to facilitate discussions across all related topics (Fletcher et al. 2014, 267; Heylighen et al. 2014, 507), further perpetuating ambiguous understandings of approaches.

Compartmentalized delivery of Universal Design knowledge also likely contributes to similar challenges in distinguishing differences between Universal Design and other related – but ultimately different – design approaches. Human Centered Design, for example, encourages empathy and one-on-one engagement with end-users during the design process to create curated and customized products and environments (Design Kit, n.d.). Participatory Design, often also called Co-Design, Public Interest Design, or Community-Engaged Design, is a process for architects to collaborate with community members, key stakeholders, and end-users of projects to elevate voices that are often underrepresented in the design process (Gregory 2003). Finally, outside of architectural education, Universal Design for Learning (UDL) has gained popularity as an education framework accounting for variances in students' cognitive abilities, languages, and learning styles (CAST n.d.). Often framed as an offshoot of Universal Design, UDL is centered on addressing barriers to learning rather than barriers in the built environment. While aspects of Human Centered Design, Participatory Design, and UDL can intersect with Universal Design, the use of these frameworks does not necessarily result in a universally-designed environment. This conflation of ideas and terms is troublesome for the advancement of Universal Design that could be addressed through a more robust and integrated educational curriculum.

2. Narrowed Focus on Accessibility and Usability

Positivist and postpositivist worldviews rooted in anthropometry, biomechanics, and other body-fit solutions have driven previous research on Universal Design (D'Souza 2004, 3; and Maisel 2012, 95-120). The objectivist ontology of postpositivism commits to the notion of a world with one singular reality (Crotty 1998, 29-31). This ontological perspective can offer clear guiding parameters for research, but it can also

result in a reductionist worldview that is stripped of context (Guba and Lincoln 1998, 204). Exploring Universal Design through these lenses is likely responsible for the objectivist checklists and normative guidelines that reinforce accessibility and usability as fundamental outcomes of human performance. These approaches to Universal Design require measurable and targeted thresholds for assessment. However, checklist-driven approaches to Universal Design do not sufficiently capture the holistic experiences of users in universally designed environments (O Shea et al. 2014). Rather, Universal Design must be measured by looking beyond functional aspects of accessibility and usability to include emotions, attitudes, feelings, and values.

Expanding Universal Design's focus to include additional demographic user groups and embrace goals beyond accessibility and usability is not uncontested. Some argue that this "post-disability" rhetoric reinforces the very systems of disability oppression that outlined the original fundamental need for Universal Design itself (Hamraie 2016, 268; Kafer 2013). Though controversial, the decentering of disability has been an underlying ideology of Universal Design since its origin. Early proponents of Universal Design encouraged appealing to broad markets by avoiding any specific focus on accessible or adaptable design, as seen in federal guidelines; this specific focus was posited to be the "kiss of death" (Story 1998, 4). Put differently, accessible design was perceived to be unsightly and institutional-looking and thus was relegated as an undesirable approach. Additionally, founders of Universal Design claimed the process could indeed address "a broad range of users, including children, older adults, people with disabilities, people of atypical size or shape, people who are ill or injured, and people inconvenienced by circumstance" (Story et al. 1998, 2). To hold space for expanding goals in future evolutions of Universal Design, a shift in paradigmatic lenses from positivism to constructivism or pragmatism is needed to establish new approaches for measuring inclusion.

3. Lack of Operationalized Guidelines

Despite the wide proliferation of the Seven Principles of Universal Design, the guidelines have been criticized for both lacking a clear goal or purpose and being limited in scope (Steinfeld et al 2012, 88). The Seven Principles were intentionally developed to be open-ended (Salmen 2011, 6.1-7.9) to neither expressly commit to nor exclude any group of people or personal identities. Unfortunately, this open-endedness and marketing the movement's applicability to "everyone" (Story, 1998) resulted in vague and potentially problematic guidance. As an example, during the design of a new academic center at Gallaudet University – a renowned institution for Deaf-centered education (Edwards and Harold, 2014). The development of the Seven Principles was meant to be a first step in building out Universal Design methods, with design strategies and evaluation instruments to follow (Story et al. 1998, 126). However, with the passing of Mace just one year later in 1998, efforts from the original cohort of experts seemingly plateaued; few of the strategies and evaluation tools followed.

While founders had good intentions to build Universal Design knowledge through future research, much of this work has yet to be realized. For starters, there is a demand for more understanding around how to better address disability inclusion through Universal Design. O Shea et al. (2018) found that Universal Design practitioners and educators were interested in learning more about non-mobility related disabilities, including mental health, cognitive impairments, and sensory disabilities, as well as hidden or invisible disabilities (722). Arguably, the need for operationalized Universal Design strategies likely also extends beyond goals of disability inclusion – which is particularly apparent given the ongoing work. While literature is increasingly illustrating the theoretical application of Universal Design for social justice across demographic groups, no roadmap exists for realizing such environments. Practitioners and educators will benefit from exemplar strategies for addressing aspects of culture, religion, language, and LGBTQ+ identity through design, further supporting Universal Design's evolution toward social justice.

4. Challenges with Universalism

The theory of universalism – a philosophical notion that one fundamental truth can be applied universally – played a significant role in shaping Universal Design as it is known today (Imrie, 2012). Rooted in universalism, traditional applications of Universal Design are cross-cutting solutions benefiting the widest number of people while still focusing on accessibility and usability of products and the built environment. A zero-step entrance is a common example of universalism in the built environment. This strategy offers multifaceted support to people in wheelchairs, an individual pushing a stroller, a traveler navigating heavy

luggage, and a person with low-to-no vision who may find steps challenging.

While many celebrate Universal Design's flexibility and all-inclusive nature, the notion of universalism lies at the root of ongoing debates, as scholars, practitioners, advocates, and policymakers strive to comprehend the movement's ambitious intentions of designing environments that work "for everyone." Some advocates of Universal Design encourage thinking of universalism not as one design solution for everyone, but rather in a sense similar to "universal" suffrage or "universal" healthcare (Steinfeld and Maisel 2012, 30). In other words, Universal Design is not necessarily about a one-size-fits all solution, but rather a fundamental right to smart and accommodating environments that should be available to everyone. Critics, however, argue that by focusing on a universal design that works for all, we are ostensibly overlooking those in the margins who are often most in need of inclusion (Costanza-Chock 2020, 53). Populations in the margins include those with intersectional identities experiencing multiple layers of discrimination and non-dominant body sizes and types. Moreover, some push back on the idea that an environment could ever truly be designed "for everyone," further questioning Universal Design's effectiveness as a panacea for inclusion (Imrie 2012, 879). Given current social and political climates that call for increased social justice, future thought leaders and scholars must consider approaches for addressing the challenges of universalism as a fundamental underpinning of Universal Design.

DISCUSSION

The synthesis of literature on existing Universal Design pedagogies above established a deeper understanding of impediments to Universal Design's evolution towards social justice. Despite an expressed interest in and need for Universal Design knowledge, architecture programs in accredited institutions have been slow to adopt Universal Design as part of the mainstay academic curriculum. Additionally, vague understandings of Universal Design are pervasively woven throughout both the development and delivery of relevant course curricula. This trend is mirrored in practice-facing pedagogies, with frameworks and standards that fall short due to vague guidance and a lack of operationalized design strategies. While thought leaders are driving theoretical scholarship to position Universal Design to address social justice, the application of Universal Design across a range of demographic groups is not supported by existing Universal Design pedagogies. In traditional academic settings, Universal Design course content and teaching methods are most often centered on disability inclusion and aging populations. The same approach is largely found across practice-facing Universal Design educational tools, as seen in practitioner frameworks and building performance rating standards.

The key challenges identified– compartmentalized delivery, a narrowed focus on accessibility and usability, lack of operationalized design strategies, and universalism – pose an obstacle to the adoption and evolution of Universal Design pedagogies in both academia and practice. This obstacle faces both traditional applications of Universal Design for disability inclusion and beyond, across emerging demographic groups also in need of more equitable environments. This article posits that, when reframed through a social justice lens, Universal Design approaches can better address discriminatory barriers in the built environment that exist for a range of excluded groups, and in turn reinvigorate interest in the adoption of Universal Design. Recommendations to address challenges and encourage future exploration, with a specific focus on supporting Universal Design's evolution towards social justice, are shared below.

Recommendation #1: Align Universal Design with Integrated Design

The Green Building movement has excelled at offering robust academic and practice-focused education, as well as integrating into formal architectural education. Examples include weaving sustainability and healthy building strategies and metrics throughout coursework in formal architecture curriculum, with focused tracks in architecture programs. Additionally, practice-focused pedagogies are popular, including LEED AP and WELL AP tracks, that are supported by consistent engagement. This integrative approach can be explored in two ways: through curriculum theory and practical application.

One way to integrate Universal Design more holistically into design education is by using Wiggins and McTighe's backward design approach (2005, 149). This strategy of course design identifies the core goal of the course first and works backward to identify what particular offerings and exercises may work toward the established student learning outcomes, providing an enriched level of topical understanding (Wiggins and McTighe 2005). By identifying a 'big

idea' as a theme that "connect(s) the dots for the learner by establishing learning priorities," tasks can be deliberately designed around these ideas. The subject for a course can then be categorized into three levels, as seen in Figure 2. Some issues are worth encountering, providing scope and context for the big idea. There are things that are important to know, such as overarching theories and specific tasks, which make up the intermediate level of knowledge. Finally, core concepts and 'big ideas' should be the foundation of the course. In the context of Universal Design, the core concept or big idea would be the broader scope of Universal Design, and the subsequent levels could be established with that in mind. Ideally, Universal Design would crosscut the three levels as shown in Figure 2.

In practical application, Universal Design could be folded more purposefully into an integrated design approach, which is becoming more popular in both professional and academic arenas. In the early 1970s, Papanek (1972, 322) identified integrated design as a holistic approach to design, bringing together traditionally disparate specialties and professions. Integrated design intentionally considers as many factors as possible – and necessary – in the design process. As the green building movement has evolved, integrated design has taken on a larger role as the preferred process for higher-performing buildings. Seemingly endless books are available covering the importance of integrated design and suggesting preferred processes (Bachman 2002; Boecker et al. 2009; Elvin 2007; Keeler and Vaidya 2016; Moe 2008). The general idea of integrated design is to bring all relevant parties together early in the building design process to establish goals, strategies, and design foundations together, so that backtracking during the design and construction process is minimized (Boecker et al. 2009). However, while the integrated design process calls for both whole-team meetings (charrettes) early in the design process (Todd and Lindsey 2016) and expanded partners in these teams including operations, maintenance, and end-users, experts on Universal Design are not often engaged, unless at the direction of the client. Fully aligning Universal Design with Integrated Design would better ensure that the Eight Goals and Seven Principles of Universal Design would be more readily incorporated into both education and practice with sustainable design as the primary vehicle. Furthermore, an integrative lens could help bring distinction to aligned design processes sharing close associations with Universal Design as previously noted, including accessibility, Human Centered Design, and Participatory Design. Accreditation for

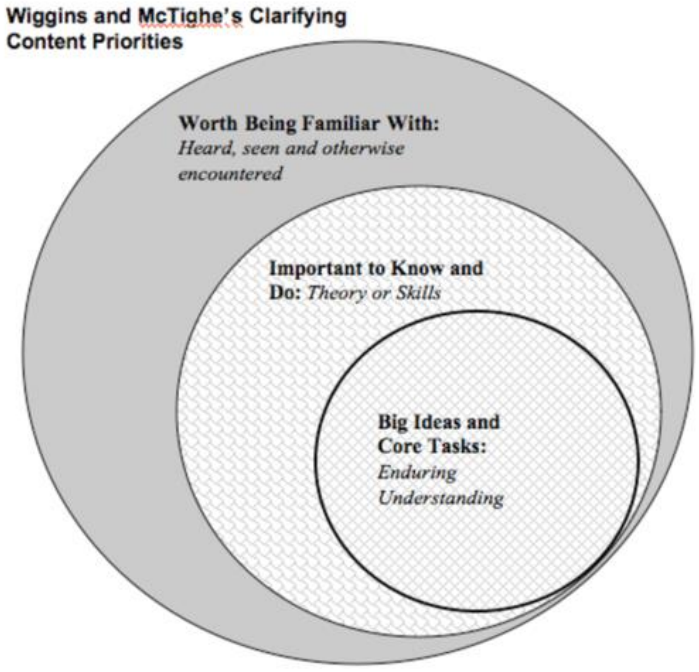

Figure 2. Clarifying Content Priorities for integrated course curriculum. (Image Source: Wiggins and McTighe, 2005).

architecture programs may also play a role in tendencies to overlook Universal Design, given the recognition of accessibility in NAAB's Conditions for Accreditation, and the lack of emphasis on a broader approach to other considerations under Universal Design.

Recommendation #2: Explore Universal Design through a Constructivist Lens

While postpositivist worldviews have helped to establish Universal Design as a measurable tool for supporting accessibility and usability, different knowledge is needed to help reposition Universal Design to address a broader population. Design researchers must explore Universal Design through different worldviews including constructivism, which accepts the assumption that multiple realities exist and are constructed through the social interactions between human beings and their world. Unlike objectivist worldviews aligning with positivist research, constructivist paradigms enable researchers to study the world beyond objects and include constructed ideas, values, and beliefs that may exist tacitly within our society (Crotty 1998, 42-65). This approach would be particularly helpful when addressing demographics beyond aging populations and people with disabilities, who may experience benefits of environments outside of usability and accessibility. Rather than limiting the focus to objective and absolute truth, constructivist lenses open the door for researchers to explore an untapped wealth of data on emotions, culture, societal norms, and human behavior. Constructivist researchers gather as much information from participants as possible through hands-on approaches, elevating the importance of human dimensionality in research and giving a voice to lived experiences (Guba and Lincoln 1998, 195-220).

Viewing Universal Design research through a constructivist lens can address the gaps established above, including providing additional insight into how Universal Design can better address both individuals across personal identities and issues of greater social justice. Additionally, bringing a constructivist worldview to the theory, practice, and application of Universal Design can impact both academic and practice-focused pedagogies. Most notably, constructivist approaches would enable the application of Universal Design to include constructed ideas, values, feelings, and beliefs. These are important issues to truly embrace and account for broader populations. By employing a constructivist lens in future research, the

Summary Table		
Key Challenges Facing Universal Design Pedagogies		**Recommendations to Address Challenges**
Compartmentalized delivery	→	Align Universal Design with Integrated Design
Narrowed focus on accessibility and usability	→	Explore Universal Design through a constructivist lens
Lack of operationalized guidelines	→	Operationalize Universal Design strategies
Challenges with universalism	→	Reframe Universal Design to Inclusive Design

Table 4. Summary table of key challenges facing Universal Design pedagogies and recommendations to address challenges. (Table Source: Authors).

body of knowledge around Universal Design could meaningfully grow, expanding beyond positivist checklists and strategies, to support broader applications and increased adoption.

Recommendation 3: Operationalize Universal Design Strategies for Social Justice

While high-level principles and guidelines offer some support to practitioners throughout the design process, more concrete operationalized strategies for Universal Design would be beneficial. Quantitative and qualitative methodologies should be developed to explore how universally designed environments can create more equity in experiences across personal identities, backgrounds, and abilities; these methodologies can be posited, peer-reviewed, and tested. As an example, constructivist case study research might explore outcomes of Universal Design using indicators such as a sense of belonging, pride, and safety. Phenomenological studies would allow researchers to tap into the essence of lived experiences beyond accessibility and usability for individuals exposed to universally designed environments. Finally, grounded theory studies could provide much-needed theoretical frameworks on how Universal Design can meaningfully address social justice, equity, and inclusion.

Developing specific Universal Design strategies in the built environment to address social justice across demographic groups will reframe "barriers" within built environments to include not only those traditional barriers that are structural – such as stairs, steep sidewalk slopes, and limited clear floor space – but also barriers such as discriminatory policies and practices, and any situation that compromises civil rights or human performance. Through this approach, Universal Design can expand to include strategies such as all-gender restrooms, non-denominational spiritual and meditation spaces, graphics to support those who speak a non-dominant language, and artwork, artifacts, and symbolic illustrations to reflect cultural inclusion. More research is needed – both in evidence and synthesis – to develop actionable guidelines and frameworks supporting Universal Design outcomes beyond accessibility and usability. Operationalizing Universal Design strategies such as the examples given will inform future policy roadmaps and practitioner guidelines, effectively repositioning Universal Design to advance greater aspects of social justice.

Recommendation 4: Reframe Universal Design to Inclusive Design

While many in the design and construction industry use the terms Inclusive Design and Universal Design interchangeably, this article maintains that the two approaches are different. Despite its many contributions to the discipline of architecture, Universal Design is often weighed down by stigma related to universalism and skepticism around whether we can ever truly design environments for "everyone." Inclusive Design, however, seems to be experiencing a surge of interest across disciplines without such negative associations. For example, Microsoft and Google both recently adopted Inclusive Design as a best practice for celebrating employee abilities in the development of products and software (Jean-Baptiste 2020; Shum et al. 2016). Additionally, organizations such as the Institute for Human Centered Design, which once focused on Universal Design, made the cognizant switch, citing Inclusive Design as a more effective initiative to celebrate diversity and gain acceptance with a wider audience (IHCD n.d.) Lastly, Inclusive Design is making significant headway in the policy arena; particularly in the UK where government-issued standards reference principles of Inclusive Design..

By reframing Universal Design pedagogies as Inclusive Design, educators and practitioners can bypass challenges associated with the traditional concepts of Universal Design, including debates over universalism, criticisms around lacking guidelines, and conflation with accessibility and other adjacent pedagogies. Going further, one could also rebrand this evolution of Universal Design as an entirely different approach – even separate from Inclusive Design – that emphasizes tenets of equity and social justice more purposefully. This recommendation is not intended to discount the immensely positive impact of the Universal Design movement; rather, this reframing is an invitation to consider how to address real challenges in reaching its potential paradigm shift toward social justice. Reframing efforts as Inclusive Design, or another approach that has yet to be determined, might offer a fresh canvas from which to develop design pedagogies that truly address inclusive environments for all users.

CONCLUSION

Design educators should examine every available tool to enable the next generation of architects to meaningfully advance social justice – including Universal

Design as a tool itself. This article outlined significant gaps in practice-facing and academic Universal Design pedagogies, with a specific focus on challenges that may hinder Universal Design's evolution towards social justice. More research and awareness is needed to ensure that future design professionals are equipped to meaningfully implement Universal Design and Inclusive Design as they craft built environments. This article further highlights how broadening Universal Design's application across demographic groups can serve to better address discriminatory barriers in the built environment, and in turn, broaden the movement's impact on social justice. Recommendations outlined here reposition Universal Design pedagogies as a pathway for creating more equitable and inclusive buildings, spaces, and communities. While there is a promising path forward for Universal Design, it will be critical for thought leaders and researchers to continue to explore the movement through diverse worldviews to inform its future. Deeper explorations of this nature will help to address a challenging question that has been facing the theory and practice of Universal Design since its inception: How can we truly design inclusive environments "for all"?

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