

UNIVERSAL DESIGN – EVOLUTION OR REVOLUTION? AN INTERROGATION OF UNIVERSAL DESIGN AS A CATALYST FOR EQUITY, DIVERSITY AND INCLUSION THROUGH THE LENS OF PRODUCT DESIGN THEORY, PHILOSOPHY AND PRACTICE

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ABSTRACT

This paper interrogates Universal Design (UD) as a theoretical and philosophical framework to encourage diversity and inclusion within Product Design. Moving beyond its origins as a response to accessibility, UD is contextualised here as a critical design positionality that challenges assumptions about users and abilities. Through an examination of Product Design theory, this study explores how it disrupts the notion of an 'ideal' or 'average' user by advocating for a more diverse understanding of the human experience. Drawing on phenomenology, design ethics and critical disability studies, the paper situates UD as a vehicle for reimagining design not merely as a means of producing artefacts, but as a practice of social engagement and ethical responsibility. By exploring diversity as an intrinsic and intuitive design value, it aligns with a contemporary, participatory and socially sustainable design approach. The paper further critiques the limitations of purely functionalist interpretations of UD, proposing instead a philosophical synthesis that embraces ambiguity, cultural diversity, resilience and the fluidity of human needs. Ultimately, the authors argue that UD extends Product Design beyond form or function and reframes design as a moral and epistemological act that transforms both the discourse and the practice of Product Design toward diversity, equity, empathy and shared human dignity. The paper is further supported by student reflections from the Design Theory and Universal Design discourse on the BSc in Product Design in Technological University Dublin (TU Dublin).

1 INTRODUCTION

Universal Design has traditionally been framed as a methodology for accessibility. Originating within late twentieth-century architectural discourse, it proposed that environments should be usable by the widest possible range of people without adaptation. However, within contemporary Product Design theory, UD increasingly operates not merely as a technical strategy but as a philosophical orientation. It challenges assumptions about who design is for, how users are conceptualised and how ability is normalised.

This paper interrogates whether Universal Design represents an evolutionary development within Product Design practice or a revolutionary epistemological shift. It argues that while UD may appear methodologically evolutionary, extending user-centred and inclusive approaches, it constitutes a deeper reorientation of Product Design as an ethical and socially situated practice. Drawing on disability studies, phenomenology, feminist epistemology and participatory design theory, the paper positions UD as a framework that recognises diversity as intrinsic to human experience rather than exceptional deviation from a norm.

2 FROM ACCESSIBILITY TO UNIVERSAL DESIGN

Universal Design is most closely associated with the work of Ronald L. Mace, who defined it as the design of products and environments usable “by all people, to the greatest extent possible, without the need for adaptation or specialised design” [1]. The Center for UD formalised this through the Seven Principles of UD in 1997 [2].

Emerging from the disability rights movement and legislative frameworks such as the Americans with Disabilities Act, early accessibility strategies were frequently compliance driven. As Steinfeld and Maisel argue, Universal Design marked a shift from reactive adaptation toward anticipatory inclusion [3]. Rather than adding assistive features retrospectively, UD proposed embedding inclusivity at the conceptual stage. However, critiques have emerged. Imrie questions whether UD's universalist ambitions risk masking socio-cultural specificity [4]. Hamraie further demonstrates that accessibility discourse historically codified certain bodies as normative while positioning others as deviations [5]. These critiques suggest that UD's transformative potential lies not in its principles alone, but in its challenge to assumptions about ability and normality.

Within Product Design, this transition signals a move away from designing for statistical averages toward acknowledging embodied diversity as fundamental.

3 PRODUCT DESIGN AND THE CONSTRUCTION OF THE AVERAGE USER

Industrial Product Design developed alongside modernist commitments to standardisation, optimisation and efficiency. As Forty demonstrates, design historically constructed consumer identities aligned with industrial rationality [6]. Ergonomics and anthropometrics reinforced the notion of an average body. Norman's influential usability framework retained this orientation, albeit with greater emphasis on cognitive and behavioural compatibility [7]. Yet, as Akrich observes, designers inscribe scripts into artefacts that configure expected users and behaviours [8]. The user is not discovered but constructed. Universal Design de-stabilises this construction. Rosemarie Garland-Thomson introduces the concept of 'misfit' to describe how disability emerges relationally between bodies and environments [9]. This reframes exclusion as a design failure rather than bodily deficiency. Krippendorff's 'semantic turn' in Design Theory further supports this repositioning by emphasising meaning-making over functional determinism [10]. UD extends this insight by foregrounding plural embodiment as a primary design condition. Diversity is not a market segment; it is an ontological constant. In this context, UD represents a disruption of the epistemic authority of the average.

4 PHENOMENOLOGY AND EMBODIED EXPERIENCE

The philosophical depth of Universal Design becomes apparent through phenomenology. Maurice Merleau-Ponty argues that perception is embodied and relational [11]. We engage the world through situated bodily experience; therefore, products mediate lived reality. Ihde's post phenomenology demonstrates how technologies shape and transform human-world relations [12]. A poorly designed artefact can restrict agency; an inclusive one can expand it. UD therefore becomes a commitment to supporting multiple modes of embodiment.

The social model of disability, articulated by Oliver, further shifts focus from impairment to environmental barriers [13]. Design is therefore implicated in the production of disability. Feminist ethics and epistemology deepen this analysis. Gilligan's ethics of care foregrounds relational responsibility [14], while Haraway critiques claims of neutral objectivity and advocates for situated knowledges [15]. In design, this translates to acknowledging that all artefacts embody values and perspectives.

Through these theoretical lenses, Universal Design becomes not merely a technical method but a philosophical orientation toward plural lived experiences.

5 UNIVERSAL DESIGN AS ETHICAL REORIENTATION

If design mediates experience, it is inherently ethical. Victor Papanek famously argued that designers bear responsibility for social and environmental consequences [16]. Universal Design extends this responsibility toward embodied diversity. Design Justice frameworks, such as those articulated by Costanza-Chock, advocate participatory processes that centre marginalised communities [17]. While distinct from UD, they share its commitment to redistributing design power. UD therefore operates as an epistemological shift. It challenges the neutral product and reframes Product Design as moral practice. Inclusion becomes intrinsic rather than supplementary. At this level, UD appears revolutionary.

6 PARTICIPATION, SOCIAL SUSTAINABILITY AND PRACTICE

Universal Design aligns with participatory and co-design methodologies. Sanders and Stappers describe co-creation as expanding creativity across stakeholders [18]. Björgvinsson et al. link participatory

design to democratic innovation processes [19]. Such approaches acknowledge the limits of designer foresight. Engaging diverse communities reveals experiential knowledge otherwise excluded. Social sustainability further intersects with UD. Manzini envisions design as enabling resilient, adaptive communities [20]. Products inspired by disability-led innovation, such as inclusive kitchen tools, demonstrate how designing for specific needs often benefits broader populations. However, tensions remain. Designing for everyone risks oversimplification. The challenge lies in embracing adaptability rather than static universality.

7 CRITIQUES AND LIMITATIONS

Universal Design is not without limitations. Hamraie cautions that universality may conceal Western assumptions about independence and productivity [5]. Cultural context shapes conceptions of ability. Market appropriation presents further risk. Inclusion rhetoric may become branding strategy rather than structural change. Additionally, critics argue that universal strategies must coexist with targeted interventions. Identity-specific design remains necessary where structural inequities persist. These critiques suggest that UD requires philosophical refinement. Rather than uniform solutions, it must embrace plurality, ambiguity and contextual sensitivity.

8 CASE STUDY

Through both complementary theoretical and project-based lenses, the third-year Design Theory module on the BSc Product Design at TU Dublin explicitly thematises Universal Design and Equity, Diversity and Inclusion (EDI). The module encourages students to not just critically challenge UD and EDI as discrete or isolated considerations but as fundamental part of a holistically considered design practice that recognises these frameworks as integral to meaningful and responsible Product Design.

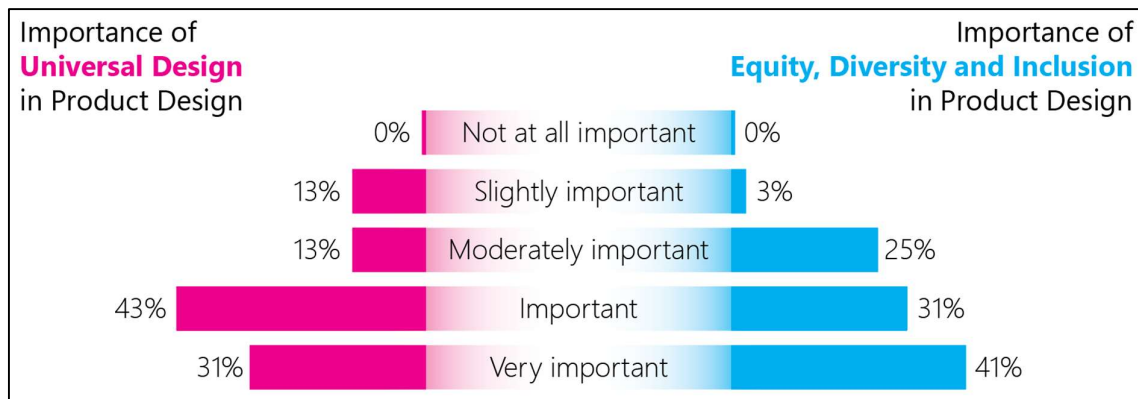


Figure 1. Quantitative results from surveying 39 third year students

39 students were tasked to reflect about UD and EDI after participating in the module. The quantitative results from the survey are displayed above in the info graphic in Figure 1, which clearly displays a strong overall recognition of the importance of both, UD and EDI. The following student reflections offer more detailed insight into how the dual theoretical–practical learning approach influenced their perceptions of inclusive design.

When asked about how Universal Design as well as Equity, Diversity and Inclusion integrated into your overall product design education, the findings indicate that UD and EDI are widely perceived as embedded within the product design programme at TU Dublin, particularly in later years, though inconsistently across modules. Many students described it as “very well integrated,” “very ingrained into the course,” and “core to design,” with several noting that “each product/assignment has always tried to reach multiple users.” Third year emerged as a pivotal stage, where UD and EDI became “everywhere” and “really clear,” particularly through the Design Theory module, which offered “interesting projects to explore it.” However, earlier years were only “touched on,” “less so,” or “not integrated enough overall.” Some students felt the content was concentrated in one area, stating, “they are only well integrated in the Design Theory module” and “it’s in one module.” Overall, while endorsement is strong, students recommend earlier and more consistent integration across all years.

When asked about the Design Theory module specifically, UD and EDI are seen as strongly embedded and influential. Students described the module as “accurate and well-integrated” and credited it with helping them “think differently” and better communicate inclusive principles. The emphasis on designing “not...for disabled people but rather...for everyone” was particularly impactful. Nonetheless, respondents called for refinements in pacing and clarity, suggesting it “could have been executed at a faster pace” and that clearer distinctions are needed between “universal versus inclusive versus adaptable design,” as “the line between these areas are blurry.” Gaps were also identified in cultural representation and exposure to examples “where design isn’t inclusive.”

Students overwhelmingly associate Universal Design with inclusivity, accessibility and “good design.” It is described as “designing for everyone” and ensuring that “no matter conditions,” users can engage equally. Many consider UD “synonymous with good design” and “what product design really should be.” Empathy is central, with students highlighting “designing with empathy and awareness of diversity” and “not just designing for people exactly like yourself.” Usability and simplicity were recurring themes, with value placed on products that are “easily understandable/intuitive” and that “avoid unnecessary complexity.” UD is also seen as socially impactful, helping to “bridge the gap of those who feel more vulnerable in society.”

Similarly, EDI is viewed as a core ethical responsibility. Students described it as “very important to me as a designer” and “an ethical principle that should be in every designer’s mind,” arguing that exclusion is “morally wrong.” EDI was closely linked to fairness and non-judgement, with emphasis on creating designs that “don’t discriminate,” “don’t make anyone feel inferior/vulnerable,” and ensure “no one would ever want to feel left out.” Awareness of social diversity, “a mix of cultures, beliefs, ethnicities,” was considered essential, alongside empathy and representation, including “acknowledging diverse users... and giving them a voice.” While some noted tensions, such as potential impacts on aesthetics or the reality that “you can’t do it all,” overall commitment remained strong.

When students were asked about how Universal Design influences their identity as product designers, it was clear that they saw it as significantly shaping their professional identity. It fosters an “open minded” and reflective approach, encouraging them to “include everyone and everything in the design choices you make.” Students connect UD and EDI to equality, asserting that “everyone deserves to...live equally with no bias” and that “no design or product should be only accessible to a certain group.” These principles guide decision-making and reinforce their identity as ethical, inclusive and socially responsible product designers committed to creating accessible and impactful solutions.

In summary, this case study illustrates how embedding Universal Design within design education can meaningfully shift students’ perceptions of responsibility, identity and practice. Exposure to UD and EDI as interconnected philosophical commitments rather than optional technical add-ons, encouraged students to critically examine their own assumptions, broaden their understanding of users and recognise inclusion as a foundational design value. While students highlighted inconsistencies across the curriculum, they also demonstrated growing reflexivity, empathy and ethical awareness when UD was explicitly thematised. The findings suggest that early, continuous and integrated engagement with UD strengthens students’ capacity to navigate complexity, embrace diversity and design with social responsibility. Ultimately, the case study confirms that teaching UD as a core design ethos provides the potential to facilitate more thoughtful, inclusive and socially attuned designers.

9 CONCLUSIONS

Universal Design can be understood as both evolution and revolution within Product Design. On the surface UD appears evolutionary in method, as it builds on what designers already do - human-centred design, ergonomics and participatory practice. Yet the arguments advanced in this paper; supported by phenomenology, critical disability studies, critical epistemology and student reflections from TU Dublin, indicate a deeper shift. UD rejects the myth of an ‘average user,’ treats disability as something that arises in the interaction between people and products and frames design as an ethical mediation of serving plural lifeworld’s. In this respect, UD is revolutionary: inclusion is not a mere optimisation task at the end of a design process, it’s a core criterion of validity starting at problem framing, evidence gathering, meaning-making and evaluating.

The case study demonstrates that when UD is taught as a philosophical positionality, it has the potential to reshape professional identity. Students reported becoming more reflexive about bias, more explicit in stakeholder mapping and more comfortable with aesthetic pluralism as well as contextual ambiguity. They also recognised the practical tensions where universality cannot be absolute. Trade-offs are real;

and targeted solutions will still be required where structural inequities persist. This pragmatic stance does not dilute UD's ambition; it clarifies where universality ends and adaptability begins, encouraging designers to build for change, contingency and difference over time.

Three implications follow. For pedagogy, UD should be threaded longitudinally into the whole curriculum, across studio work, project briefs and assessments. Students should learn how universal, inclusive and adaptable design relate to each other but are not the same. For professional practice, UD calls for participatory governance of design decisions, treating 'edge case' testing as a standard part of prototyping and transparent documentation where equity compromises occur. For policy, procurement rules and standards should reward design processes that evidence inclusion from the very beginning, not just products that meet minimum accessibility compliance at the end.

Ultimately, UD is best understood as a moral and epistemological commitment that expands what counts as good design: not only artefacts that function and delight, but systems that recognise, respect and redistribute the conditions of participation. If the aim of Design Theory is to make explicit the values already shaping practice, then the most successful outcome of this discourse would be to render separate references to 'UD' and 'EDI' unnecessary because design, done well, is already universal.

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