

A monthly publication of Design for All Institute of India
March 2024 Vol-19 No-3
ISSN: 2582-8304

Design for All



Everyday Thoughts

Guest editor: Dan Formosa, Ph.D.
ThinkActHuman, New York

March 2024 Vol-19 No-3

- 1. Guest Editorial: Everyday Thoughts:.....2**
Dan Formosa Ph.D
- 2. Designing a World for All: The Evolution of Inclusivity:.....6**
And Accessibility in Design
Pablo Ulpiano
- 3. Generative AI: Helping or Hindering People with Disabilities?:18**
Natalie Marques
- 4 The Problem of Noise-Lifelong Sound Health by Akoio®:.....23**
Bill Schiffmiller ,Michael Piskosz
- 5. Wearable heart monitor considers every user:.....30**
Margaux Boyaval
- 6. Beauty Is for Everybody. But Is It?:.....34**
Natalia Formosa
- 7. Designing adaptive clothing:.....49**
Benjamin Havrilak
- 8. The Future is Touch, A Call for Haptics in Education:.....56**
Keith Kirkland
- 9. Turn design education upside down:.....69**
Dan Formosa Ph.D.
- 10. My chatbot has arthritis:.....80**
Dan Formosa Ph.D.

Other Regular Features

GUEST EDITOR



Dan Formosa Ph.D.

Dan consults with companies and organizations worldwide on design and innovation. An early proponent of "design for all" (a.k.a. Inclusive Design), he also lectures internationally on research and the future of design. He established his company ThinkActHuman with the goal of design for a better world. Dan holds degrees in product design, ergonomics and biomechanics. In addition to ThinkActHuman he co-founded 4B Collective, focused on design and gender, and co-founded the Masters in Branding program at the School of Visual Arts in New York.

He is the recipient of numerous awards, including Smithsonian's Cooper-Hewitt National Design Award (on behalf of Smart Design). He also received IxDA's first annual Interaction Design Award, in the "Disruptive" category, for his work with Ford Motor Company. His work is included in the permanent collection of the Museum of Modern Art. He appears in a number of documentary films on design, including the award winning 2020 Life on Wheels. In other work, he's the host of the successful YouTube series Well Equipped, produced by Epicurious for Condé Nast, critiquing in a less-than-serious way the usability of various odd kitchen gadgets. He also co-authored and co-illustrated Baseball Field Guide, a bestselling book incorporating the best principles of

information design to clearly explain the complex rules of Major League Baseball, now in its fourth edition.

Contact:

dan@thinkacthuman.com

Guest Editorial:

Everyday Thoughts

Dan Formosa, Ph.D.

Physical and cognitive challenges can be short term or lifelong. It can sometimes take relatively little additional effort to develop products and services that accommodate a wide range of people. That requires, however, that those products and services consider a wide range of people at the outset, not as an afterthought. A disability is defined by the ability or inability to perform a task, often a function of design. Design makes a difference.

Because living with challenges is an everyday occurrence, I set the theme for this issue of *Design for All* to be “*Everyday Thoughts*.” With that purposely wide-open theme I enlisted a group of authors who have thoughts on design for all, in various topics.

In *Designing a World for All* Pablo Ulpiano discusses inclusive design with examples from his experience working with Johnson & Johnson. In *Generative AI: Helping or Hindering People with Disabilities?* Natalie Marques cautions about inclusive biases encountered when using artificial intelligence. *The Problem of Noise* by Bill Schiffmiller and Michael Piskosz discusses the effect of noise on our wellbeing. Turning to medical devices, Margaux Boyaval’s *Wearable heart monitor considers every user* shows how a heart monitor should be designed to accommodate female as well as male anatomy. Natalia Formosa discusses beauty

products, and efforts to accommodate everyone, or not, with her article *Beauty Is for Everybody. But Is It?* In a similar sentiment, in *Designing adaptive clothing* Benjamin Havrilak discusses his work with Tommy Adaptive clothing, a product line enabling people who otherwise can have difficulty dressing themselves. Keith Kirkland recently received a fellowship and is teaching a course on haptics at Kansas City Art Institute, addressing the needs of people with visual impairments. His article, *The Future is Touch, A Call for Haptics in Education*, discusses the need for attention to haptics, and a link to a soundtrack!

I authored two articles for this issue. The first asks if education in design will ever prepare product designers for designing for everyone – unless we *Turn design education upside down*. In my second article, as an experiment I interviewed a chatbot, Google Gemini – first asking if he/she/it (whatever pronoun is appropriate) can take on the personality of a person with arthritis. I titled that article, appropriately, *My chatbot has arthritis*.

Dan Formosa, Ph.D.



Pablo Ulpiano is a multifaceted leader in program management, creative direction, and education, renowned for propelling brand equity with his strategic acumen and innovative approaches. At Samsung, he excels as the Brand Creative and Governance Manager, where he enhances global brand consistency. His prior role as Innovation & Experience Design Program Manager at Kenvue highlighted his capacity to lead successful product launches and initiatives focused on sustainable innovation.

His significant impact at Johnson & Johnson as Group Innovation & Brand Experience Design Lead showcased his ability to synergize creative and strategic efforts, contributing to the global growth of the company's design capabilities. Earlier in his career, Pablo's roles at Ganassini and S&P Global underscored his creative leadership, driving key branding and design projects. His commitment to fostering the next generation of leaders is evident in his role at the School of Visual Arts, where he developed a

pioneering curriculum that merges design thinking with sustainable practices, preparing students for success in a socially responsible business landscape.

Pablo's journey reflects his unique blend of creativity, strategic planning, and dedication to ethical practices, making him a pivotal figure in enhancing brand engagement and sustainability across industries.

Designing a World for All: The Evolution of Inclusivity and Accessibility in Design

Pablo Ulpiano

Design is transforming. The conversation has shifted from purely aesthetic considerations to a broader discussion about how we interact with products or services. With the rise of technology and a growing awareness of diversity, the importance of designing everyday objects and digital interfaces to cater to all users has never been more relevant. This conversation is not just about compliance or ticking boxes for diversity; it's about recognizing the rich tapestry of human experience and ensuring that everyone has equal access to the tools, products, and services that shape our lives. Whether it's the way we navigate the web, interact with our smartphones, or use household items, inclusive and accessible design principles challenge us to rethink the standard approach to design and create a more equitable and welcoming world for everyone. It's clear that this topic is not just a matter of design philosophy but a reflection of our values as a society committed to fairness, dignity, and inclusion for all.

Design has always been about facilitating meaningful interactions between people and the world around them. This fundamental principle has guided its evolution becoming a critical tool in crafting experiences that are both inclusive and accessible. Today's design ethos underscores the importance of empathy and functionality, emphasizing that design is not experiencing a new trend towards human-centricity but a return to its original intent. It's about bridging gaps, understanding diverse needs, and creating solutions that enrich everyone's lives. In essence, it has

never strayed from its primary mission: to make the world a more navigable, understandable, and enjoyable place for all.

Throughout history, it has played a pivotal role in shaping human interaction with the environment. From the earliest tools crafted by our ancestors to the sophisticated technologies of the modern era, design has been instrumental in enhancing the human experience. Expanding upon this topic, it's crucial to delve deeper into the historical context of design evolution and its impact on accessibility and inclusivity.

In ancient civilizations, such as Mesopotamia and Egypt, design was primarily driven by utilitarian needs. Tools and implements were crafted to facilitate essential tasks such as farming, hunting, and construction. However, as societies evolved and civilizations flourished, design began to encompass aesthetic considerations as well. The artistry of design became intertwined with functionality, giving rise to objects of beauty and utility.

The Industrial Revolution marked a significant turning point in the history of design. Mass production techniques revolutionized the manufacturing process, making goods more accessible to a broader segment of the population. However, the emphasis on mass production often came at the expense of individuality and customization. Standardization became the norm, leading to a one-size-fits-all approach that overlooked the diverse needs and preferences of users.

In the 20th century, the field of design underwent a series of paradigm shifts that transformed its trajectory. The Bauhaus movement, with its emphasis on simplicity, functionality, and craftsmanship, revolutionized design education and practice.

Designers such as Dieter Rams and Charles and Ray Eames pioneered minimalist aesthetics and user-centered approaches that prioritized the needs of the end-user.

As technology advanced and globalization accelerated, design became increasingly intertwined with issues of accessibility and inclusivity. The rise of digital technologies brought about new opportunities and challenges in design. On one hand, digital interfaces offered unprecedented flexibility and customization options. On the other hand, they posed significant barriers to individuals with disabilities or limited digital literacy.

In this context, Donald Norman's seminal work, *The Design of Everyday Things*, provided a foundational perspective on the importance of intuitive and user-friendly design. This book highlights the critical role of design in bridging the communication between objects and their users, emphasizing the need for designs that are not only pleasurable to use but also mitigate the blame placed on users when interactions fail due to poor design. Norman's career, marked by significant contributions to cognitive science and human-centered design, underscores the shift from mere functionality and aesthetics to designs that prioritize human needs and behaviors.

But what exactly do we delve into when we discuss inclusivity and accessibility? While these terms frequently intertwine, creating a tapestry of meaning, they each hold distinct nuances that are crucial to understanding the breadth of design's impact. This exploration becomes particularly illuminating when we consider the journey of everyday objects and technologies through the lens of design's evolution.

Accessible design focuses on removing barriers to usability for individuals with disabilities. It involves crafting solutions that enable people with sensory, cognitive, or physical impairments to navigate their environments effectively. For example, installing ramps alongside stairs provides an alternative pathway for wheelchair users, ensuring they can access buildings and spaces with ease. Accessible design is outcome-oriented, with a primary focus on addressing specific adaptations to enhance usability and inclusivity.

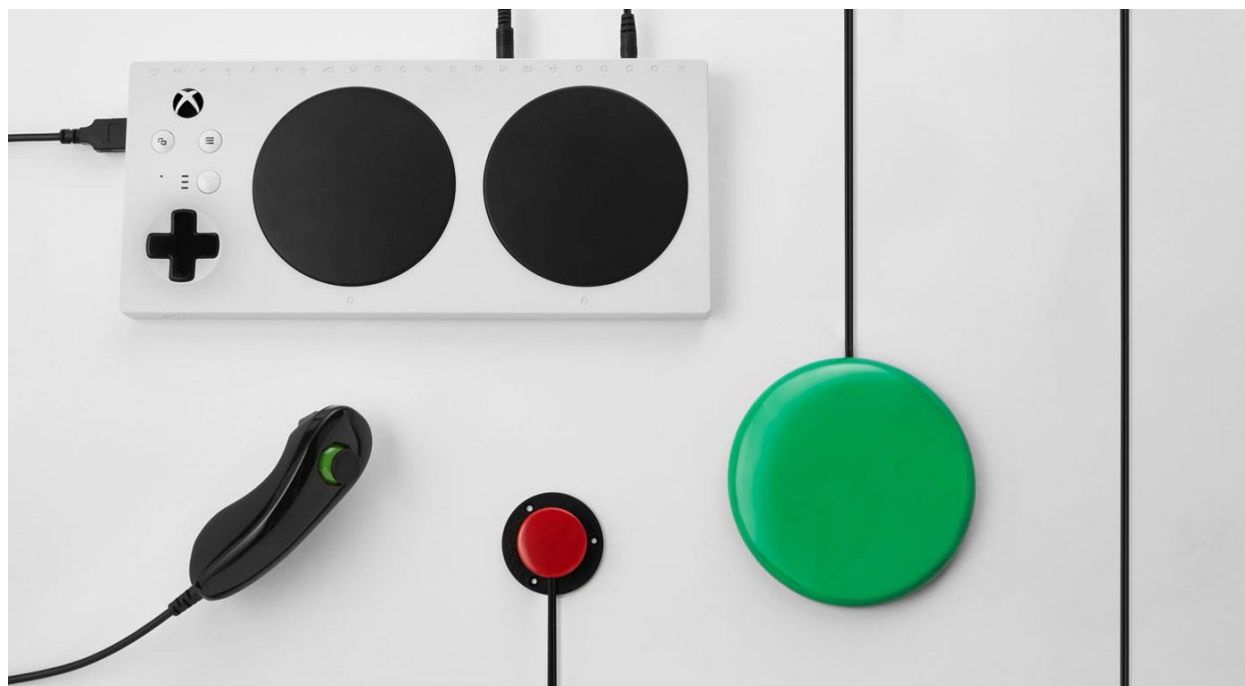
A concept often conflated with accessible design is *ergonomics*; however, while they share similarities, they are distinct in their focus and objectives. Accessible design aims to eliminate barriers for individuals with disabilities, ensuring products, services, and environments are usable by people of all abilities. It focuses on specific adaptations needed for various disabilities. Ergonomics involves optimizing human well-being and overall performance, incorporating anthropometric data to enhance interactions with products and environments. It aims to improve safety, efficiency, and comfort for all users, not just those with disabilities. While accessible design addresses the needs of individuals with disabilities to ensure they can use and access environments and products, ergonomics focuses on optimizing design for human use, considering physical comfort, efficiency, and prevention of injury across the general population.

Inclusive design, on the other hand, adopts a broader perspective than of accessibility, seeking to accommodate the full spectrum of human diversity. It encompasses considerations such as age, gender, ethnicity, language capabilities, and more, in the design process. It is process-oriented, emphasizing the importance of incorporating diverse perspectives from the outset.

In an increasingly globalized world, acknowledging and respecting cultural nuances is paramount to creating inclusive experiences. Cultural sensitivity in design involves delving into the rich tapestry of cultural narratives, symbols, and meanings that shape people's perceptions and experiences. By embracing the principles of inclusive design, designers can create products and experiences that not only accommodate but celebrate human diversity and resonate with diverse audiences on a global scale.

For contemporary everyday objects, this dual approach enriches the user experience significantly. An example of where these concepts come alive is in the design of a smartphone: Accessible design might be represented by the voice-over function for those who can't see the screen, while an inclusive design feature is the intuitive touchscreen interface that caters to a broad range of users, from tech-savvy teenagers to senior citizens. Together, accessible and inclusive designs ensure that our world is not just a place where we all live but a place where we all thrive.

Google and Microsoft exemplify corporate entities that have embraced inclusive design principles, transcending traditional notions of accessibility. *Google's camera technology*, which adjusts to capture accurate skin tones, and *Microsoft's Xbox Adaptive Controller*, designed for gamers with limited mobility, showcase how technology can be tailored to accommodate diverse needs and preferences. These innovations not only enhance usability but also promote inclusivity by empowering individuals to engage fully with digital experiences.



Practical examples further illustrate the transformative potential of inclusive and accessible design in everyday contexts. For instance, Johnson & Johnson's BAND-AID® Brand has introduced innovative solutions to address the needs of diverse user groups. The **OURTONE™** line of adhesive bandages offers a range of skin tone options providing representation and inclusivity for communities of color. Additionally, the **Sensitive Skin** adhesive bandages cater to individuals with skin sensitivities, ensuring that everyone can access essential healthcare products without discomfort.

Building upon the conversation around inclusive and accessible design, it's important to highlight practical examples that showcase how these principles are applied in the creation of everyday objects, enhancing the user experience for a broader audience. In addition to the innovative efforts by Google and Microsoft, the development of BAND-AID® Brand's **OURTONE™** and **Sensitive Skin** adhesive bandages by Johnson & Johnson

offers a compelling case study in inclusivity and accessibility in product design.

The OURTONE™ line represents a significant step towards inclusivity, specifically addressing the lack of diversity in skin tone representation among adhesive bandages. These bandages come in three distinct shades of brown, acknowledging and celebrating the beauty of diverse skin tones, and in doing so, they provide a more personalized healing solution for communities of color. This initiative not only reflects a commitment to diversity but also leverages product design as a platform for social equity, contributing to a broader conversation about representation and inclusivity in everyday items.

On the other hand, BAND-AID® Brand's Hypoallergenic Adhesive Bandages for Sensitive Skin focus on accessibility by catering to individuals with sensitive or eczema-prone skin. These bandages are designed to be gentle, hypoallergenic, and provide strong protection without causing pain or discomfort, making them accessible to those who may struggle with traditional bandages due to skin sensitivities. The inclusion of Sensi-Layer technology for painless removal further exemplifies a commitment to accessibility, ensuring that the bandages can be used comfortably by people with various skin conditions.

Together, the introduction of OURTONE™ and Sensitive Skin bandages illustrates how thoughtful design can address and overcome barriers to inclusivity and accessibility in the products we use daily. By considering the wide range of human diversity, from skin tone to skin sensitivity, BAND-AID® Brand demonstrates how brands can play a crucial role in creating more equitable and welcoming experiences for all users.

When designing branding materials, cultural sensitivity plays a pivotal role in fostering inclusivity and resonance with diverse audiences. Logos and visual elements serve as the face of a brand, embodying its values and identity. By incorporating cultural diversity into branding, companies can create meaningful connections with consumers from different cultural backgrounds, fostering trust and affinity.

Inclusive and accessible design also have significant implications for healthcare, education, and social services. By ensuring that medical devices, educational materials, and public amenities are designed with accessibility in mind, designers can empower individuals with disabilities to lead more independent and fulfilling lives. Moreover, inclusive design practices can foster a greater sense of belonging and community among marginalized populations, ultimately contributing to a more equitable and inclusive society.

In conclusion, inclusive and accessible design hold the key to creating products, services, and brand experiences that are truly welcoming and usable by everyone. By championing these principles, designers and brands can not only expand their market reach but also contribute to a more inclusive, understanding, and connected world. As we continue to navigate an increasingly complex and interconnected world, the importance of embracing inclusive and accessible design principles cannot be overstated. It's not just about design; it's about creating a world where everyone feels seen, represented, and valued.





**PAINLESS
REMOVAL**



Natalie Marques is a Brand Strategist with 5+ years of experience in design, marketing, account management, and brand strategy. She began her career in nonprofits, working to drive impact and awareness for social causes including women's representation in the media, child hunger, and homelessness. She is pursuing a Masters in Branding at the School of Visual Arts under the leadership of Debbie Millman . In her free time, Natalie likes to take comedy classes, draw, and search for the best coffee in NYC.

Generative AI: Helping or Hindering People with Disabilities?

Natalie Marques

We have entered the golden age of AI. Although ChatGPT only entered the zeitgeist at the tail-end of 2022, just 1.5 years ago, Artificial Intelligence (AI) has already transformed how we work, live, and think. With endlessly updated AI software from the largest global tech companies, including Gemini (Google), Copilot (Microsoft), Mid journey, and DALL-E, we now have seemingly infinite access to information, image generation, and academic support with simple strokes of a keyboard. However, with any technological advancement, we must be wary about how these technologies have been created and who they can support and potentially harm. All AI software is developed using data developed by humans, and therefore imbues the technology with human bias and error. We must consider who has created this technology, and more importantly, who was left out of the room when it was created. There is a debate on whether AI technologies will ultimately help or hurt people living with disabilities. The advent of AI creates the potential to improve the lives of people with disabilities, while potentially expanding the learning, knowledge, and experience gap between people with disabilities and those without.

According to the World Health Organization, there are over 1.3 billion people living with a significant disability, representing 16% of the global population. AI and tech companies have the opportunity to further develop and share assistive technologies to

help people with disabilities, including those who are mentally, visually, audially, or physically impaired. An article in the Harvard Business Review lauded AI for its potential to support the over 386 million working age individuals with a disability: "Generative AI can help individuals find – and do well in – jobs that they couldn't previously have held" ([Harvard Business Review](#)). In particular, AI can help empower users and seamlessly fit into their lives by promoting communication through AI-powered voice technologies, offering learning opportunities, facilitating greater autonomy, and sparking connection and collaboration with friends and colleagues. Many AI technologies have already been designed to empower and support people with disabilities. For those who are visually impaired, [Microsoft Seeing AI](#) app provides audio description of external objects and experiences. [Google's Live Transcribe](#) empowers hearing-impaired people with immediate and accurate text-to-speech transcription. Looking ahead, technology like AI-powered self-driving cars can assist those who are unable to drive, enabling in-person access to community and instilling a greater sense of freedom and autonomy.

However, the potential for bias is significant. We have seen this in facial recognition software which has been found to be less accurate for people of color because of the biases of training data and of developers, ultimately creating barriers to access and security. As Laurie Henneborn states in her Harvard Business Review article, "we haven't done well as a society with the digital divide that exacerbates the barriers between persons with disabilities (as well as other marginalized communities) and others." We have only just started adjusting technology to make it more accessible to all abilities. Unfortunately, we are seeing AI used in ways that are non-inclusive of people with disabilities, like health insurance companies using AI to flag individuals with

complex medical needs and application screeners acting with bias based on resume language that suggests possible impairment.

Although AI is not a cure-all for the challenges faced by people with disabilities, when developed and implemented responsibly, it has the potential to mitigate barriers, improve quality of life, and foster a more inclusive world. If we are to create AI that's accessible and inclusive of all abilities, it will be important for AI technologies to "learn" from unbiased sources and people with first-hand experiences with disabilities. AI has the opportunity to make everyone's lives better and easier – but we need to be careful that it does not become a tool to exclude people of different abilities for the sake of company profit.

Sources:

- <https://www.forbes.com/sites/forbesbusinesscouncil/2023/06/16/empowering-individuals-with-disabilities-through-ai-technology/?sh=77702e1c6c73>
- <https://hbr.org/2023/08/designing-generative-ai-to-work-for-people-with-disabilities>
- <https://www.theverge.com/24066641/disability-ableism-ai-census-qalys>
- <https://www.linkedin.com/pulse/5-ways-artificial-intelligence-empowering-people#:~:text=Assistive%20technology&text=For%20example%2C%20people%20with%20visual,objects%2C%20people%2C%20and%20text.>
- <https://www.nytimes.com/2022/03/29/technology/ai-robots-students-disabilities.html>
- <https://smartclick.ai/articles/how-ai-can-improve-the-lives-of-people-with-disabilities/>
- <https://gemini.google.com/>



Bill Schiffmiller

Bill Schiffmiller, Founder and CEO of Akoio™, is dedicated to enhancing the lives of people with hearing loss and noise issues. Inspired during graduate school at Pratt Institute by the lack of innovation in hearing products, Bill founded Akoio to transform the maintenance of hearing wellness into a rewarding experience. With a background as a leader of Accessibility Advocacy for Apple, Inc., and influenced by the universal design philosophy of Sam Farber, founder of OXO, Bill brings his passion for accessibility to Akoio, striving to empower individuals to live their fullest lives while effectively managing their hearing and noise-related concerns. Bill and his wife led missions to provide hearing aids to hard-of-hearing Filipinos in the Philippines.

bill@akoio.com



Michael Piskosz

Michael Piskosz, Director of Research at Akoio, is deemed the global expert for tinnitus and sound sensitivity. During his 15+ years of hearing aid manufacturing experience at GN ReSound and Oticon Medical, he has been a pioneer in creating accessible and affordable digital tinnitus solutions. He has authored numerous articles and has presented in over 25 countries.

michael@akoio.com

The Problem of Noise

Lifelong Sound Health by Akoio®

Bill Schiffmiller

Michael Piskosz

Are we prepared to manage the long-term societal health implications of continuous exposure to intrusive and disruptive noise levels in our lives?

Do we have the wellness tools to counterbalance the negative effects of noise?

Noise can have short term, long term or permanent debilitating effects. In response we established Akoio, with a mission of combating the adverse impacts of disruptive noise while harnessing the power of sound wellness for a healthier and more balanced life. In doing so we're pioneering a revolutionary era in consumer wellness. We're introducing a unique life-long sound management approach for all. The Akoio Life-Long Sound Health Model addresses three cornerstones to improve overall wellness through sonic experiences.

Lifelong Sound Health cornerstones:

- 1. Mitigate disruptive noise***
- 2. Enhance sound wellness***
- 3. Maximize communication***

Helping people mitigate disruptive noise in their lives addresses the unspoken need to reduce the toxic levels of noise that affect us as a society and degrade our overall well-being. The fact that we can't see, taste, or smell noise may help explain why it has not received as much attention as other types of pollution, such as air and water. Unwanted noise is around us every day, yet most of us would probably not say we are surrounded by noise that is detrimental to our lives.

We have learned to live with noise, tolerate and co-exist with it, but is it allowing us to live better?

According to The National Library of Medicine (NIH), "Over 100 million Americans are exposed to unhealthy levels of noise."* The effect of noise goes beyond the auditory system and hearing loss. Noise is associated with an increased incidence of cardiovascular diseases, annoyance, disturbed sleep, and impaired cognitive performance. The effects of excessive noise affect our health and our ability to work. According to the World Health Organization (WHO), excessive noise can result in a 5-10% decrease in productivity, affecting communication, focus and concentration. Excessive noise at home, caused by loud neighbourhoods , daily landscaping, local traffic, or construction can interfere with remote work, daily routines and disturb sleep patterns, leading to sleep deprivation, fatigue, and poorer overall well-being. Noise is ubiquitous, and having the proper tools and services to mitigate noise over time helps manage our current environments and allows for preventive measures to delay the onset of hearing loss and other health concerns.**

Enhancing sound wellness, by incorporating therapeutic and rejuvenating sonic experiences into our daily lives, can help reduce stress, restore energy, and improve concentration, focus

and overall well-being. These healthy sonic experiences can also counterbalance disruptive and intrusive noise. Providing consumers solutions to exchange disruptive noise with enhanced sonic experiences can lead to improved health and performance.

Current channels for sound and noise management products do little to understand user needs. Finding expert advice to help match the best product to a specific need is confusing, complicated and often times unavailable. Users often don't have time to explore products in great detail on their own or are left to make choices based on limited knowledge. This can result in cycling through multiple products before finding an appropriate solution, leading to product selection that does not enhance their sonic experience, or even worse, purchasing products that fall short of addressing their needs.

Noise is hard to escape and is increasingly intrusive and disruptive throughout our daily lives, but where can we go to address this? As we continue to strive to become a healthier society in the future, accessible and affordable platforms that help us to perform at our best will be the leaders of that charge. Because of this, Akoio believes it is essential to consider the social, economic, and health implications of noise exposure and work towards creating more equitable and healthier living environments for all members of society. Managing disruptive noise, while enhancing our sound wellness, can improve productivity, health, and connection in our daily lives and communities.

The medical model of sound and noise management is audiology. While audiology is crucial in delivering prescriptive hearing solutions to patients with moderate to severe hearing loss, which primarily focuses on improving communication, this model lacks solutions for people who need sound and noise management help

and do not require hearing aids. The audiology model is reactive and focused on diagnosing hearing loss and determining appropriate hearing aids. Audiologists provide late-life amplification solutions, where the average hearing aid user is 60 years old.* The audiology industry faces challenges reaching younger generations, expanding their commercial sound and noise management services and offering affordable solutions. There is hardly any focus on preventative care or solutions focused on improving overall well-being by mitigating intrusive noise and utilizing sound wellness.**

There are ways to provide lifelong sound solutions without the use of hearing aids. By making lifelong sound management accessible and affordable to all, we can facilitate much-needed awareness and education around these issues, while providing solutions and services that allow everyone to proactively mitigate detrimental noise and incorporate healthier sound wellness behavior in their lives. Akoio's mission is to empower people of all generations to become more productive, feel more rested, and increase their overall well-being.

References:

* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4819987/>

** <https://www.cdc.gov/niosh/topics/noise/default.html>

***<https://hearingreview.com/inside-hearing/research/marketrak-2022-navigating-the-changing-landscape-hearing-healthcare>



Margaux Boyaval

Margaux Boyaval cultivates high-performing user-centric design and innovation teams in MedTech and FemTech. She is an expert in user experience strategy and solution development.

She has led multiple market launches for digital health and medical device products. Her professional experience over 25 years ranges from being a client partner for Fortune 500 companies at Ximedica (now Veranex) to establishing CX & UX capabilities to advance high-profile brands at Amgen and Teva Pharmaceuticals Digital Health.

She has shared her knowledge through speaking engagements and mentoring programs. She has been awarded over 20 patents and was awarded the Reuters Pharma Awards Most Valuable Breakthrough for the Digihaler line of connected inhalers in 2023.

She is a wife and mother of two teenage daughters living in the clean air and scenic hills of southern New Hampshire, USA.

Wearable heart monitor considers every user

Margaux Boyaval, Nova Design

www.wearenova.co

Nova Design uses the principle Design for All to create physical and digital interfaces for healthcare clients. We take an inclusive approach called Universal Design. Universal Design is about creating solutions in a way that the maximum number of people can use the product as is. All things are considered to make the product easy to use for those with or without any kind of physical or cognitive impairment.

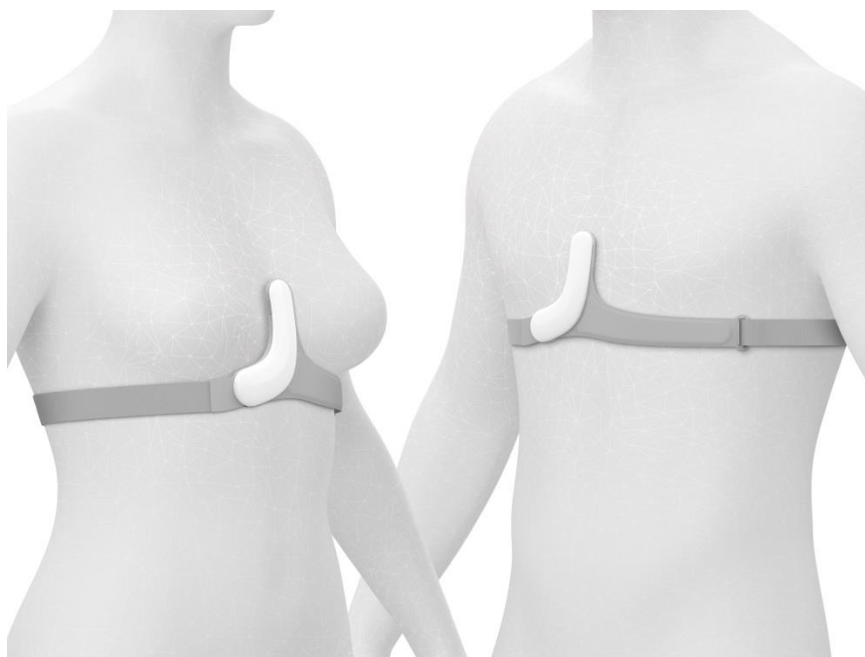
"Universal design is design that's usable by all people, to the greatest extent possible, without the need for adaptation or specialized design."

–Ron Mace (an architect with polio who coined the term in the 1980s)

Often when medical devices are designed the functionality, accuracy, and technology take precedence over what will work best for the user. As a result, the user might have to adapt how they interact or make compromises. These compromises impact the user experience negatively and create frustration and dissatisfaction. Compromises are not necessary when the Universal Design approach is used during the design and engineering phases. When it comes to healthcare products designing with this approach can create better health outcomes.

Nova Design was challenged to design a wearable heart monitor that worked well for both men and women. We knew instantly

that we could do much better than the existing heart monitors. This new heart monitor will be prescribed by doctors and worn by patients over time to assess or diagnose critical heart-related conditions. Knowing that the heart monitor needed to be comfortably worn by both men and women for long periods of time to accurately capture data meant we had to design for all using the Universal Design approach.



Existing heart monitors were not able to capture accurate long-term readings from women. Why? Because they didn't fit a woman's anatomy very well. There is an optimal location for heart monitor sensors on the chest and the existing solutions did not consider women's breast size and location as they relate to the sensor placement. As a result, they could not capture accurate readings. Existing heart monitors use either adhesive to stick directly onto the skin or use elastic straps that fit around the torso or chest to hold the sensors in the correct place. Adhesive monitors do not stay adhered well enough and often fall off or cause skin issues during wear. Heart monitors with elastic straps end up placing the sensors too low on a woman's chest and do not get accurate readings. Using the approach of Universal Design the

Nova Design team set out to design a heart monitor that is easy and comfortable to wear and is gender-inclusive – considering a range of body types and sizes - for both men and women. Designing something that works well for all users eliminates any compromises.

As a first step, we collected data on both men’s and women’s chest dimensions and sizes. Then we created prototypes that were worn and tested by a range of users. After user testing we refined the design. To get better sensor placement we miniaturized the electronics and created a novel “L” shaped design so that sensors can be placed accurately and comfortably on a woman’s chest both below and between the breasts. We eliminated external electrodes to give female users the ability to easily wear undergarments and allow all users to move freely and have peace of mind that their clinician gets the data they need for important heart health decisions. By using the principles of Design for All and the Universal Design approach we created a heart monitor that is accurate, comfortable, and provides accurate, critical data that clinicians need to diagnose and monitor all their patients successfully. At Nova Design, our passion is Design for All – we strive to consider and amplify the needs of those that often get overlooked. When users’ physical, emotional, and cognitive abilities are considered and designed it creates a great experience for every user. We will continue to bring the principles of Design for All to our work and decision-making to ensure that the future is designed to include all.



Natalia Formosa is a beauty marketer and product innovator and a faculty member in the School of Visual Arts, Masters in Branding where she teaches Design & Market Research. Throughout her career, Natalia has developed and launched successful fragrance and skincare products, created successful beauty brand campaigns and winning communications, and crafted brand strategies for major CPG brands. Her experience spans corporate, start-up and agency.

<https://www.linkedin.com/in/natalia-bednarek/>

Beauty Is for Everybody. But Is It?

Natalia Formosa

The reasons why beauty fails to address consumers with disabilities and why brands should pay attention.



Image source: Gemini, "Illustration of a vintage perfume bottle with a pump in a pink color scheme, where bottle and background are pink."

Although we've been witnessing the gender and racial gap narrow in the beauty industry over the last few years, there is still a lot to be done. The disparities are gradually being addressed by increasing exposure of female and BIPOC (Black, Indigenous, and People of Color) startup founders, increasing leadership

opportunities for those individuals, and more inclusive consumer-facing marketing efforts. These matters have received long-deserved attention among media outlets, retailers and brands. One group, however, that remains overlooked and marginalized in beauty is the community affected by disability.

Whether it's spina bifida, arthritis, autism, color-blindness or vision loss - there are many physically or neurologically challenged beauty enthusiasts in the world that want to feel included. According to the 2018 report by The American Institutes for Research, there were 20 million working-age adults with disabilities in the US, representing \$490 billion of disposable income after tax.¹ This value was very comparable, for instance, to after-tax disposable income of African American market segment in the same year. Fast forward to 2024, these numbers have likely increased - Centers for Disease Control and Prevention states that 12.1% of US adults had a mobility disability, while 4.8% had vision disability in 2023². Let's keep caregivers and families of those affected in mind too, whose lives are influenced by beauty lovers with disabilities.

It's not just a profit pool for beauty brands to tap into this market segment. It is also an opportunity to incorporate inclusivity and diversity as key brand values and make a difference - make consumers with disabilities feel considered, welcome and a part of the beauty community. There is a handful of beauty brands and products built with inclusive design in mind, however we have not

¹American Institutes for Research, Michelle Yin, Dahlia Shaewitz, Cynthia Overton, Deeza-Mae Smith, "A Hidden Market: The Purchasing Power of Working-Age Adults With Disabilities", April 2018, <https://www.air.org/sites/default/files/2022-03/Hidden-Market-Spending-Power-of-People-with-Disabilities-April-2018.pdf>

² Center for Disease Control and Prevention, "Disability Impacts All of Us", May 2023, <https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html>

seen this audience being catered to and considered on a larger scale.

Clichéd beauty ideals impact representation in marketing

I was lucky to have interviewed multiple individuals for this article who offered their valuable perspective on the topic. One of them was Ken Labbé known on Instagram as @labbe_arome2.0 who is a digital creator with a disability in the world of fragrance. We spoke about the notion of beauty that exists in our society which is neither inclusive nor diverse: "Well, everybody has their idea of what beauty is, right? And sometimes your idea of beauty is not someone in a wheelchair." The existing beauty stereotypes are what sells mainstream and ultimately adds to the bottom line, hence what we see depicted in beauty advertising.

Natasha Caudill, a makeup influencer with color-blindness and low vision, with millions of views on TikTok, started her channel in 2019 because there was nobody like her online that spoke about makeup and vision impairment. The beauty category wasn't something she could relate to. "I don't know if I have ever seen a makeup campaign with a model wearing glasses. I wear glasses every day and I want to know how my makeup is going to look with glasses on."

In marketing, showcasing product benefit front and center, like eye shadow, is key. However, speaking of representation and relatability to all consumers, there are many opportunities across brand touch points to incorporate such representation and include assets with models in makeup wearing glasses (even as simple as a product display panel's image gallery).

Another issue with advertising is that brands seem to have a specific image of a model with a disability in mind and a specific image of disability representation in a campaign. “Every time you see a person in a wheelchair in a campaign, it’s the same type of wheelchair. And there are so many different types of wheelchairs out there.” Natasha’s friend uses a wheelchair and they often talk about the challenges they notice in society, like the same type of wheelchair or the same type of disability continuously represented in advertising.

Beauty ideals have been ingrained into our brains over the years through repetition - it’s like the alphabet we learned at school without questioning its sequence and rationale (which in fact has no logic to it). These beauty standards dictate what beauty brands represent in marketing campaigns. There has been some progress - beauty is not just white anymore and there is more acceptances of size differences. Yet, beauty is still able-bodied.

As a former marketer at Coty, I have to highlight the #UndefineBeauty corporate campaign launched last year focused on unleashing every vision of beauty and changing the norms around what beauty means. The campaign has been well received. These strong corporate-level efforts, however, have not yet been reflected in individual brand campaigns in Coty’s portfolio.

Aesthetics and cost efficiency win over accessibility

Given the nature of the beauty industry, packaging has always been (and still is) focused on aesthetics. On-shelf appeal and attractiveness of makeup, skincare, haircare and especially fragrance products are key considerations for product development and brand marketing teams. At the lowest cost

possible. The truth is, accessibility may cost more and require more effort - consider design, packaging development, materials, and usability testing associated with creating an inclusive product. Most brands choose to spend more of their budget on aesthetics than inclusivity.

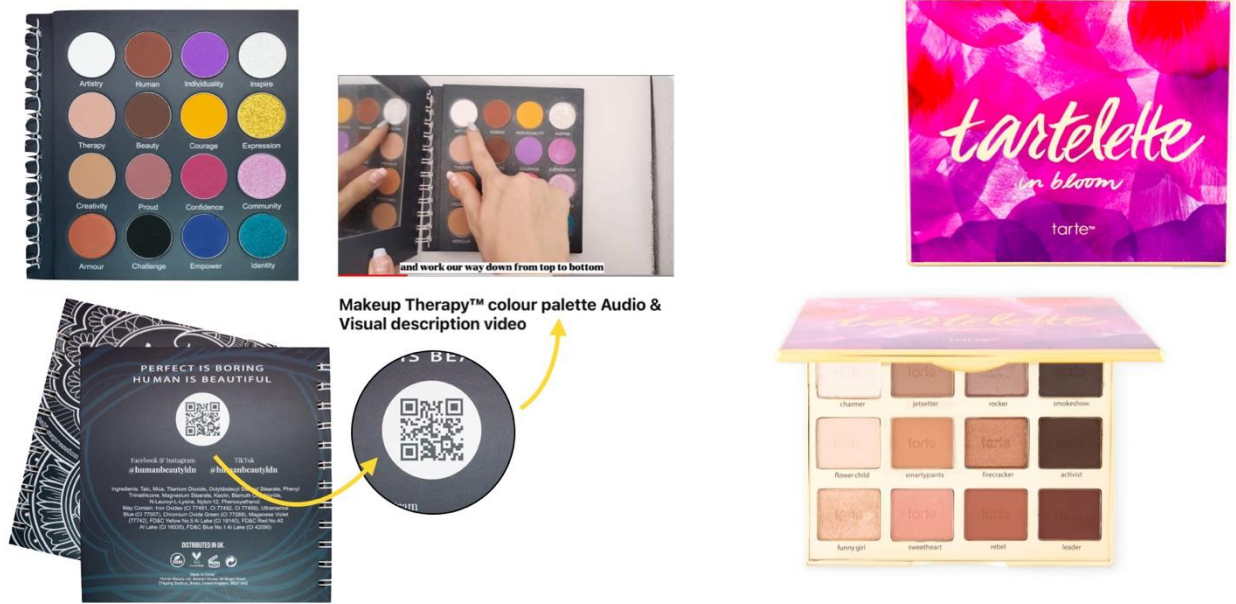
For Millie Flemington-Clare, UK-based founder of an inclusive makeup brand Human Beauty, born with rare genetic condition called Cystinosis (considered an invisible disability), incorporating accessibility in beauty packaging doesn't have to cost more. "Sometimes the simplest of changes can be the most effective". It may be choosing a square mascara tube vs. a round one. Human Beauty's mascara was launched in a square packaging to prevent it from rolling on the floor when dropped and making it easier to twist open. For larger companies that develop custom molds and tool their packaging, addressing accessibility as part of the design is not going to impact the cost significantly.

We've seen companies investing in sustainable packaging despite it driving higher cost of goods. Inclusive design is rarely a consideration. In contrast to product claims around sustainability, there are no guidelines and regulations that define an inclusive product. As Lene Andersen, an award-winning writer and advocate for rheumatoid arthritis community, points out "Inclusive design doesn't have any standards. Anybody can say this is inclusive whether its design is inclusive or not".

Incorporating inclusive design as a brand attribute doesn't necessarily mean that the product will work for everyone. It's about including more people and making products easier to use for everybody. For the consumer with a disability, noticeable lack of consideration by brands is one of the biggest barriers to beauty.

For Lene, lack of inclusion demonstrates “deliberate exclusion” in today’s world: “Part of my lack of interest [in beauty] compared to 10 years ago is that beauty is not accessible to me. You see something and then you look at what it takes to get there. After a while you stop going where you feel excluded”. Imagine going to a nail salon for a gel manicure and realizing your hand (affected by deformity caused by arthritis) doesn’t fit in the lamp. Millie adds “[Many experiences by the disabled community] are dehumanizing.”

Most people who aren’t affected by a disability don’t think about inclusivity. Consider making an eye shadow palette or a nail polish accessible to a color-blind makeup enthusiast like Natasha. When the way you see the world is like a black and white movie, the names of colors on packaging matter a lot. Brands are coming up with very cool and catchy names - take OPI Spice Up Your Life or *Verified* nail polish colors, or Activist and Funny Girl shades in the Tarte eye shadow palette for instance - but they don’t tell you anything about the actual color. This makes it inaccessible to color-blind consumers and requires them to go on a website to check the color descriptions or leverage an app to recognize and understand the colors. Human Beauty was able to solve for that by incorporating a QR code on the packaging with video and audio content explaining the colors. It’s a relatively easy solution any makeup brand could include in their packaging to make everyday use easier for everyone.



Human Beauty Makeup Therapy color palette with audio & visual description on Youtube
Image source: humanbeauty.co.uk

Tarte Tartelette in Bloom color palette
Image source: amazon.com

Color cosmetics see the most progress

Out of all beauty categories, makeup has shown the most effort at addressing consumers with disabilities. From smaller makeup brands like Human Beauty or Guide Beauty that are focused on creating inclusive makeup products to bigger brands like Urban Decay with the line of ergonomic eyeliners, Estee Lauder's makeup assistant app for visually impaired consumers and L'Oreal's latest computerized makeup applicator called HAPTA, we're seeing signals of disability considerations in the beauty industry.

In the nail and hair removal space, CVS Beauty introduced "one+other" in 2023³, a brand offering inclusive beauty essentials (for example, easy to hold and squeeze tweezers, nail clipper,

³ PR Newswire, "CVS Pharmacy introduces new universal tools collection from one+other", July 2023, <https://www.prnewswire.com/news-releases/cvs-pharmacy-introduces-new-universal-tools-collection-from-oneother-301883483.html>

cuticle nipper) designed to make self-care more accessible. This launch was well thought out in a way that it incorporates easy to open packaging, and tactile cues to distinguish between the tools. The line was developed in collaboration with members of the disability community.



***Universal Tools Collection by the CVS brand one+other.
Image source: PR Newswire.***

Haircare and skincare are slower to adopt inclusive design but show some progress. Skincare brands like Humanrace and Biotherma incorporate Braille on their packaging (yet the first one for brand name only and the latter on outer packaging only). For the last few years, Herbal Essences has been using tactile notches on their bottles to help visually impaired consumers distinguish between shampoo and conditioner. It's a basic usability feature that allows for the correct product choice in the shower, for anyone with reduced vision.

Fragrance remains pretty dismissive about including consumers with disability. While working in fragrance for the past 2 years, I am personally not aware of a launch, campaign or product development process that incorporates (or considers) inclusive design. Ken's experience in reviewing fragrances with inclusive

design in mind hasn't been positive either "I love great big bold packaging, but it's so difficult sometimes [...] I don't want it to be complicated. Most times, you know, my disability is complicated."

Given the lack of options or alternatives, "people with disabilities become very clever in how to use products" says Millie. Lene told me about using a makeup brush to apply moisturizer because she is unable to reach her forehead otherwise. What early stages of addressing accessibility can mean for brands is educating consumers on different ways of using their products in regard to disability challenges. It can be as simple as educational content on or in a package and across social channels.

Makeup, skincare and personal care brands have at least shown that they are trying, but the progress that we're seeing is slow. True and authentic inclusivity is 360 and long-term

Disability representation in beauty (if any) is usually momentary and then it's gone. Or it considers only one aspect of disability but not others that are equally important. Oftentimes it seems like a product was created for people with disabilities by people that don't have a first-hand experience with disability or have not consulted with consumers affected by a disability.

Urban Decay's ergonomic liquid eyeliners have received positive reviews for usability by customers with dexterity issues - easy to hold, apply, allowing for more control. However, the packaging is hard to read, failing to address people with low vision. This launch, although appreciated by beauty consumers with disabilities, seems to be a one-off initiative as opposed to becoming a part of the product development process across all launches.

A makeup tools brand Guide Beauty was created with inclusive design at its core. Its products allow for easy makeup application. The brand's positioning is all about inclusive design and product ergonomics. However, it could benefit from a more community-focused approach like that of Human Beauty, which seems to be more believable. Both brands, however, are driving progress in promoting inclusive design. Kohl Kreatives is another brand that contributes to the positive change through its collections of makeup brushes that are designed for consumers with motor disabilities.

Humanrace is a brand I would like to highlight for doing a great job at beauty representation. It's latest limited-edition launch in partnership with Tyler, the Creator - the signature green nail polish - showcases a representation of hands in its product gallery. From long nails and dark skin tones, short nails and lighter skin tones to various ages and hands affected by arthritis, the hand model images feel relatable, real and inclusive.



le FLEUR* x Humanrace Nail Polish product gallery featuring a representation of hands.
Image source: [humanrace.com](https://www.humanrace.com)

Recently, more brands started inviting beauty influencers with disabilities to their product launch and brand events. Many, however, don't consider accessibility using a 360-degree view. Think about an influencer on a wheelchair invited to a beauty event at a venue that is not accessible without secured disability

assistance for them. It's not authentic, not believable and may be perceived as a PR tactic rather than a real effort to include the community affected by disability.

On the other hand, we're noticing a trend in the beauty industry where companies focus on product innovations around accessibility that are digitized and technologically advanced. Take L'Oreal's new invention HAPTA, the world's first handheld computerized makeup applicator. Although the device is a breakthrough product, there are some accessibility considerations. The cost of the device (estimated between \$150 and \$200⁴) is too high for most beauty consumers with disabilities. According to Millie "It can't be over-engineered and expensive because part of the problem and a barrier to accessibility is cost." Lene had a similar reaction "I'm looking at this and it looks great, it also potentially looks heavy, and how much does it cost. If it's over \$70 I'm not buying it." Distribution, availability and price are key factors to consider when designing for the beauty consumer with a disability. Holistic inclusivity, across all brand and product touchpoints is what's truly believable.

Lack of representation in leadership roles

A large part of the problem contributing to existing discrimination of the beauty consumer with a disability is lack of representation of such individuals in leadership and management among beauty companies. People without a disability won't think about accessibility because it doesn't affect them. Unless it gains higher

⁴ CNN, "This L'Oreal device aims to help people with limited mobility apply makeup", January 2023, <https://www.cnn.com/2023/01/05/business/loreal-hapta-ces/index.html>

awareness in the industry or becomes a trend - like the sustainability boom over the last few years.

According to the Disability Equality Index 2023 list for "Best places to work for disability inclusion"⁵, we're seeing a lot more beauty retailers listed than beauty brands. Although corporations like L'Oreal , P&G and Unilever have received the highest score, that doesn't necessarily translate to representation in decision-making and management roles, where a voice in the room is needed to advocate for (or at least educate and raise awareness about) beauty consumers with disability.

What I have heard from each and everyone I interviewed for this article is the need and preach for engaging with the community affected by a disability to receive feedback and insight on what this community is thinking. Whether it's increasing representation in upper management roles, including leaders with disabilities on company boards, working with disability consultants, or simply ongoing outreach and engagement of consumers with disabilities, brands should rethink how they approach their DEI (diversity, equity, inclusion) efforts in everything they do. Currently, inclusive design and disability considerations in strategy, marketing, advertising and product innovation are rather an afterthought, a standalone project or a PR (public relations) initiative - not a part of internal processes, bigger mission, company values and approach. Stronger engagement with content creators with disabilities, due to their increasing visibility on social platforms, is the first step many brands are taking.

⁵Disability:IN, "2023 Best Places to Work ", <https://disabilityin.org/what-we-do/disability-equality-index/2023companies/>

Consumers with disabilities continuously learn how to advocate for themselves. Many don't talk about their disability. Many struggle with confidence. Many feel separated by society. Beauty is a category that allows for self-expression, confidence boost, the feel-good factor, the mood uplift. Beauty is for everybody. And everyone has the right to feel beautiful. What we would like to see from beauty brands is consideration for inclusive design and support in normalizing the disability in our society by driving representation and acceptance.

Special thanks to my interviewees for sharing their perspective and contributing to my piece:

***Ken Labbé* (Instagram: @labbe_arome2.0) is a content creator focused on reviewing fragrances with disability consideration in mind.**

***Natasha Caudill* (Instagram: @natashac44, TikTok: @natashacaudill) is a beauty content creator at the intersection of makeup and color-blindness with over 1.3M followers on TikTok.**

***Lene Andersen* (Website: yourlifewithra.com) is an award-winning writer, disability advocate and author of "Your Life with Rheumatoid Arthritis" book.**

***Millie Flemington-Clare* (Instagram/TikTok: @humanbeautyldn) is a founder and CEO of Human Beauty, an award-winning makeup brand focused on driving representation, accessibility and inclusive design in beauty.**

Sources:

1. **American Institutes for Research, Michelle Yin, Dahlia Shaewitz, Cynthia Overton, Deeza-Mae Smith, "A Hidden Market: The Purchasing Power of Working-Age Adults With Disabilities", April 2018, <https://www.air.org/sites/default/files/2022-03/Hidden-Market-Spending-Power-of-People-with-Disabilities-April-2018.pdf>**
2. **Center for Disease Control and Prevention, "Disability Impacts All of Us", May 2023, <https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html>**
3. **PR Newswire, "CVS Pharmacy introduces new universal tools collection from one+other", July 2023, <https://www.prnewswire.com/news-releases/cvs-pharmacy-introduces-new-universal-tools-collection-from-oneother-301883483.html>**
4. **CNN, "This L'Oreal device aims to help people with limited mobility apply makeup", January 2023, <https://www.cnn.com/2023/01/05/business/loreal-haptaces/index.html>**
5. **Disability:IN, "2023 Best Places to Work ", <https://disabilityin.org/what-we-do/disability-equality-index/2023companies/>**



Benjamin Havrilak

A New Yorker by birth, Benjamin works in advertising and the creative industry, specializing in the fashion, beauty, and luxury sector. He holds a Master's Degree in Branding (M.P.S.) from the School of Visual Arts in New York City.

Benjamin got his professional start working with one of the most prestigious fashion brands in the business, Giorgio Armani. A storyteller, he is passionate about bringing concepts and ideas to life. He excels in telling brand and product stories that visually articulate a brand's image, and thrives on finding ways to innovate and move with the ever-changing digital savvy customer. He is art director at the Tommy Hilfiger North America design studio, working on the Tommy Adaptive clothing line.

Designing adaptive clothing

Benjamin Havrilak

Tommy Hilfiger has always been a brand filled with optimism, a brand that people aspire to be associated with. At the age of 18 Tommy was selling jeans out of the trunk of his car. He soon opened a boutique called People Place. Since then, he has been one of the most celebrated and socially connected American designers ever. Tommy took it upon himself to go a step further.

"I learned through having children with special needs how much Tommy Adaptive was needed. Every piece is the same quality, the same fabric and the same design we offer everyone else. The bonus is discreet, truly functional modifications that make that make dressed easier and allow both children and adults with disabilities to have independence and feel great about themselves." – Tommy Hilfiger

Tommy Hilfiger Adaptive launched its first line in the Spring of 2016, and has been on the forefront of fashion for people with disabilities ever since. We were the first global fashion house to feature apparel for people with disabilities, people that were kind of forgotten about. One of my greatest highlights working for Tommy was getting to work with this amazing community, filled with passion and drive.

The clothing not only helps the community express themselves through fashion, the line features apparel that helps specific

needs within the community: easy neck openings, magnetic buttons, Velcro and hook and loop pulls. The list goes on.

A disability can be temporary. In the summer of 2021, I broke my wrist playing hockey. I had to have surgery and couldn't use my hand for 5 weeks. I couldn't button my shirt or put on my pants and I struggled to just do everyday tasks that we typically take for granted. That injury helped me to push for the adaptive story and help tell it, as the clothing really helped me get through that summer.

In my work I cast various talents for the campaigns, with kids and adults ranging from various disabilities, as I want to convey what attribute the clothing provided. I came up and designed an icon system, so that when people see the clothing paired with an icon and short description, it helps tell the product story with conviction.

In addition I designed a kit that retailers can use to showcase the adaptations in stores, to the many curious customers that are inquiring about the ever growing line. This kit was awarded an International Design Award medal, in the Design for Society category, which additionally adds to the line's visibility.



MAGNETIC BUTTONS
ARE HIDDEN
UNDERNEATH
TRADITIONAL
BUTTON PLACKETS
TO AID THOSE
WITH LIMITED
DEXTERITY.

MAGNETIC BUTTONS

MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS

MAGNETIC BUTTONS MAGNETIC BUTTONS MAGNETIC BUTTONS



Not only did this help tell a really intriguing product story, it helped showed the benefit of how Tommy Hilfiger Adaptive could help people in their everyday lives – not only look and feel cool, but to make it easier to live independently, get dressed every day to go out and take on the world.



Keith Kirkland

Keith Kirkland is a designer, engineer, futurist, and haptics enthusiast that is deeply excited about bringing the use of touch in product design and movement learning. He is a serial entrepreneur inspired by the intersection of touch, equitable business models and wearable tech. His goal is to create impact-driven products with tactile experiences that scale. He is currently the Leonard Pryor Fellow at the Kansas City Art Institute. His work has been recognized by the Pratt's Rowena Reed-Kostellow Award, SXSW, The Smithsonian, TED, Dropbox, Google, Verizon, The Yokohama Government, Perkins School for the Blind, Unilever, Bauhaus, The Cerebral Palsy Alliance Research Foundation, EY, and the MET Museum.

The Future is Touch

A Call for Haptics in Education

Keith Kirkland

The word HAPTIC means "of or relating to the sense of touch."

I learned this life-changing word at the ripe elder age of 33, during the final year of my third degree-granting program at the Master's level. I was with the director of the Digital Arts and Humanities Research Center at Pratt Institute, Henry Yoo, along with about 12 other members whose work ranged the gamut between art, music, design, and tech.

We had just witnessed a haptic product demonstration. A company had figured out a way to "pan" the sense of touch, much like audio engineer span sound from one ear to the other. By independently adjusting the balance, or maximum volume in the left and right ear, they could create the illusion of sound in space. Similarly, this technique created a sense of spatiality through the skin. And I had never before experienced anything like it!

Imagine holding two ends of a string taut between each hand with your eyes closed. Now, envision a large vibrating bead capable of sliding back and forth on the string, akin to an old counting abacus. Imagine being able to discern precisely where the vibrating bead is spatially, solely by feeling the variation in vibration intensity channeled through each hand holding the

string. With remarkable clarity, one could understand exactly where the vibrating bead is located.

Feeling is Believing

When it was my turn, I was nothing short of astonished. I found it mind-blowing that I could feel the vibrating bead's location so accurately; it almost felt like I could "see" it moving. However, there was one glaring detail: there was no vibrating bead at all. The two vibrating motors generating the sensation were not even physically connected to each other; they were independently held in each hand. The haptic illusion of panning touch felt so insanely real that I walked out of that room a changed person. It had never dawned on me that illusions so common in vision and sound could be possible in touch, and that realization completely altered the direction of my life. When I got home, I turned to my most wordiest of friends and asked them, "Hey, do you know

"When I got home, I turned to my most wordiest of friends and asked them, "Hey, do you know what 'haptic' means?" To my utter shock, almost no one had ever heard of the word. "Like 'optic' is for eyes, 'haptic' is for skin," I'd say." Their eyes would widen in understanding, "Ah!", and then we would move on with the conversation. But I never moved on.

Haptic means Touch

I have been repeating this sentence for a decade. For millions of people, I was the one who first introduced them to *that* word. I wondered how a word so closely related to something as basic as touch could be unknown to so many people, including myself. As an exercise in building empathy, imagine having to explain the word "vision" to almost every person you meet, even though they use their eyes and sight every day. It was an ego boost to feel so

cutting-edge, but it also felt like this cutting edge had been experienced by other senses long ago. I started to ponder why haptics felt like such a mind-blowing concept, both to myself and to others.

To understand the root of the haptic story, I started to make historical connections through thought experiments. Touch has historically been treated as the lowest of the five senses. As a result, we have had less research spending on the development of technologies that take advantage of touch.

In contrast, over the last millennium, the greatest scientific heavy weights were making massive contributions in thinking power to the study of sight, and secondarily, of sound. Greats like Pythagoras, Aristotle, Plato, DaVinci, Newton and Goethe all made significant contributions in the study of vision and color. Aristotle, who wrote the first theory of color, also ranked the 5 senses in a hierarchy. His theory on color would dominate popular thinking for almost 2000 years, until the work of Sir Isaac Newton.

"Aristotle's classical hierarchy of the **senses** deems "sight" the highest of the **senses**, followed in order by hearing, smell, **taste**, and **touch** (Jutte 61).

Philosophers have privileged the "distance" **senses** such as sight and hearing over the "bodily" sense of TOUCH due to notions that distance from the object perceived yields objectivity, which in turn might lead to knowledge. And proximity to the object perceived yields subjectivity, which implies the risk of self-indulgence (Korsmeyer 361). This sense hierarchy is not uncontested. Theorists have argued

that “ This sense hierarchy is not uncontested. Theorists have argued that this hierarchy is not a universal "given," but a social construct influenced by philosophy, human evolution, and technological progress (Jutte 61).” (Source: University of Chicago 2004)

Society had built a social, and technological, construct around the senses that promoted the sense of seeing and hearing over the other senses. When paired with the dominance of the religious doctrines of the time and the way they emphasize the removal of touch as necessary to remove temptation, human touch was seen as both sin, in connection to intimacy and sex, and subjective, in connection with understanding knowledge. Finally, the world of science and religion had a common belief. And those impacts would ultimately affect how the scientific community would view, explore and invest in the sense of touch for thousands of years to come.

The Story of Wear Works

In 2014, the same year I was having my mind-blown with the concept of haptic illusions, I also was working on my master thesis. After a few years working in fashion for companies like Calvin Klein and Coach, I decided I wanted to use design in a way that would help forward humanity. After 3 years of being away from fashion, I had deeply missed it. My new pathway, wearable technology, enables the combining of all of my previous skills and interest into one beautiful cohesive ball. And I used my thesis as a way of bridging the gap.

I wanted to build a suit that would allow a person to download Kung fu. But there was one problem, I had no idea of how to communicate movement without an instructor being in the room.

Initially, I thought about using audio. One day as I was hunched over in my chair, my roommate, without saying a word, gently put the index finger from one hand on the front of my right shoulder and the thumb from the other hand into my spine near my lower back. Instantly, I sat up straight. In one gentle gesture, they had communicated how to fix my bad posture. In that moment, I realized that if I had haptic motors where they had placed each finger, and motion captured at a to know my current and optimal posture, I could replicate that experience without a movement teacher needing to be in the room.

Upon completing my thesis, I decided to continue this work. I partnered with some classmates, and we started [WearWorks](#). Our first product, [HapticNav](#) and [Wayband](#), was a free haptic navigation app and optional haptic wrist band that gently guided users to their destination without the need for any visual or audio feedback. In 2017, we assisted the first blind person in running the NYC marathon without being tethered to a sighted guide.

Over the next 9 years, I had the chance to meet with the “Who is Who” of the visually impaired community. I worked with major blind organizations around the world, including the US, The UK, Sweden and Romania. I met leaders of major blind organizations like Lighthouse Guild, Helen Keller National Center, American Federation for the Blind and National Federation of Blind. I’ve worked with poets, Paralympians, entrepreneurs and musicians who were visually impaired. I even had the privilege of being invited to support as an advisory board member for the [Howe Innovation Center](#) at Perkins School for the Blind, the largest school for blind people in the United States. As I was spreading my message of touch as the 3rd lane to access the “digit

superhighway”, I found a deeply receptive audience. “From the age of 0-5, 85% of the learning information we consume is visual.” (Source: Blind Spot)

As we built the company, a realization dawned on me. We were telling the story of a potential multibillion-dollar touch industry. When we were able to capture and distribute hearing and sight media, it created entire new world economies and ecosystems that today are valued at over \$100 billion. The haptic market got its roots in the gaming industry. The global gaming market, valued at \$245 billion, is nearly three times larger than the film and music industries combined. Furthermore, it is projected to grow to \$645 billion in just the next six years. Pair that with the 745 million people globally living with severe visual or hearing impairments, and the future of touch interfaces feels not only imminent, but also essential.

Haptics: Becoming a \$100 Billion Industry

As a founder, you have to envision a future that doesn't exist. The current global haptics market was valued at \$4 billion in 2023. As a founder focused on the future, I began contemplating: What major shifts would we need to prepare for as the haptics industry approaches \$100 billion? Standardizations across haptic platforms, privacy and ethics issues related to collecting haptic data and physiological responses, and user interface developments for non-technical users who want to use haptics without the deep technical expertise, are just a few.

But for me, one thing stood out as the BIGGEST challenge. There are too few pipelines to develop and nurture haptic talent, and the ones that are available usually start at the Ph.D. or Master's level.

I was pitching a dream of a billion-dollar haptic enterprise and quickly realized that if we ever got that big, we would have a massive staffing shortage. Further more, since [the average Ph.D. salary in the US is over \\$100,000](#), it means that staffing a haptic company could be prohibitively expensive, especially for a startup.

The Future Follows Research Spending

In 2023 at SXSW, I walked on to a stage. Not as a pitch contestant, though I was one the year prior. This time I was the opening act for the Pitch Awards. In a moment of creative expansion, I wrote a rap song with the goal of educating people about the meaning and benefits of haptics. This was the only song I have ever written, and SXSW was the first time I had ever performed. I would go on to perform this song at scientific-based conferences around the world.

"Haptics (We have a Vision)" by Keithius, Sonic P., & The Source Academy Kid

"We have a vision, Of a world that doesn't need vision. Elevating touch to the level of, Sight and Sound and that is our mission. Research spending, Today is access tomorrow for all of our children. Look at the spending!"

Why does an [Oculus Quest 2 VR headset](#) only cost \$199, yet a [Braille key board](#) cost \$2,700? My overly simplified hypothesis: We spent more research funding figuring out how to make VR headsets less expensive because there was a big potential for a payout for the team that could pull it off, and we, as a society, haven't seen that same potential (until recently) in pursuing assistive tech.

I once read an article that I can no longer find. In the article, there was a graph highlighting the spending on research over the

last 100 years for each of the 5 senses. There is no surprise that vision-based research topics and projects receive more than half of the total funding spent on all the senses combined over the last 100 years. Hearing-based research was a very distant second. And for other senses of touch, smell, and taste, compared to vision, spending was almost negligible.

"Seeing is believing, (yup) most went to vision. Second was sound and pretty far distant. For a hundred years, Money only spent on two senses! Isn't that senseless!?"

The Bose Corporation specializes in sound. Their company motto, "Better sound through research", is not just a statement. There was a famous conversation between Dr. Amar Bose, the CEO and founder of Bose, and the head of the noise reduction division, who would later become Bose's president. "Dr. Bose, do you know how much we have spent? Over \$50 million [and 15 years developing noise-canceling]?" he said. **Dr. Bose's response was classic.** "\$50 million! If this were a publicly traded company, I would have been fired years ago." Ultimately, Bose would go on to dominate the sound industry, building category-defining products using the very technology that they previously sunk millions into exploring, through research.

A Call for More Haptics Education in Undergrad

Where we spend our research dollars determines the future. Research is often a personal journey. Many researchers are researching things or subjects for which they have developed a personal interest in or a connection. Often their interest comes from an exposure during their personal lives or early academic journeys. By the time most soon-to-be researchers are selecting

their Ph.D. focus, they have already developed a clear interest in their topic of choice.

Human-Computer Interaction (HCI) is the closest thing we currently have to a degree in Haptics. The first challenge is that it is usually offered at the Ph.D. and Master's levels of education, making it inaccessible for undergraduates and non-college students. The second challenge is that haptics is often just a small focus of the total Human Computer Interaction program. Contrast that with the time I spent in design school studying color and color theory. We spent years learning how the eye and brain process color information, how texture and material can change the appearance of color, and how the psychology of color and its impacts on human perception, can affect usability and user preferences.

I earned the word HAPTIC at the age 33 ,and it changed my career path. But not many people would be willing to change their path so late in their careers. All of a sudden, the answer seemed simple. We need to introduce students, aka future researchers, to the concept of haptics earlier in their academic careers.

I knew what an artist was when I was 6 years old. That is how I became an artist. I knew what an engineer was when I was 12 years old. That is how I became an engineer. I learned about shoe design when I was 24. That is how I became a handbag and shoe designer. I learned what an industrial designer was when I was 27 years old. That is how I became an industrial designer. I learned what the word HAPTIC meant when I was 33 years old. That is how I became a Haptic Designer.

A Serendipitous Opportunity

As I was realizing the challenges of building a pipeline of Haptic Designers, I started to make plans for creating a 4-year degree program that would teach haptic design. Most of the other 5 senses have a 4-degree of study at the undergraduate level surrounding it. Culinary arts, music performance and theory, graphic design, and visual arts. For touch, the closest proxies are massage, performing arts, and physical therapy.

Haptics101: Design for the Sense of Touch@KCAI

Now, I am a visiting lecturer and artist fellow at the Kansas City Art Institute. As [the Leonard Pryor Fellow for Accessibility](#), I have been given a unique opportunity to bring accessibility awareness to the greater student, staff, and faculty body. I have also been given the chance to create a new class based in social practice.

Haptics 101 was conceptualized to bring non-technical majors exposure to the concepts of haptic technology. We explore haptics through several modalities to give an overall understanding of how to understand and use touch to create unique and embodied user experiences.

Haptics have a strong connection to writing. Most authors know what haptic means because they are using haptic words to create realism and analogy :I had a ROUGH day .That salesman was so SLIMY. She has the WEIGHT of the world on her shoulders. So we start students with a study of haptic words, with the aim of having them select 3 words and build an analog haptic object that embodies the 3 haptic words that were chosen.

In the second project, a responsive haptic experience, we teach the students basic coding for Arduino to build physical computing capabilities. Students all start with the same input sensor, in this case, a magnetometer, gyroscope, and accelerometer, and create a unique motion-based haptic experience.

For the final project, the students use haptics to solve a real-world problem. They will start with a person and a problem. They build a solution that uses any sensor as input, paired with a haptic output, to create an experience for the user that solves their problem using the sense of touch. Students are allowed to explore a range of sensors as inputs, while being restricted to the output being in haptics.

What Does the Future Hold for Haptic Design Education?

I believe that touch can become the 3rd lane into the digital superhighway. Touch is a more accessible lane, and it will allow the offloading of information that previously needed to be communicated with visuals and audio. My hope is that by inspiring the next generation of Haptic Designers and giving them access to the tools I discovered so much later in life, that we can begin to build awareness and interest in developing more touch-based research to forward the industry.

We have all seen the impact of the “curb cut effect”, a term that has been used to show how developing solutions for people with accessibility needs actually gives everyone a better experience. Closed captions, audio books, virtual voice assistants, and yes, curb cuts, have had outsized impacts on people without disabilities. “A rising tide raises all ships.”

Beyond accessibility, the tapestry of touch is deeply woven into our human experience. In a terrible real-life study, newborns who were orphaned and not touched, died. Nurses soon realized that by spending just a little time touching them, they could improve their mortality rates dramatically. Touch is foundational to life. And it's time we put the dogma of touch implication aside and stopped being so afraid of exploring the most important sense we have as humans.



Dan Formosa Ph.D.

Dan consults with companies and organizations worldwide on design and innovation. An early proponent of "design for all" (a.k.a. Inclusive Design), he also lectures internationally on research and the future of design. He established his company ThinkActHuman with the goal of design for a better world. Dan holds degrees in product design, ergonomics and biomechanics. In addition to ThinkActHuman he co-founded 4B Collective, focused on design and gender, and co-founded the Masters in Branding program at the School of Visual Arts in New York.

He is the recipient of numerous awards, including Smithsonian's Cooper-Hewitt National Design Award (on behalf of Smart Design). He also received IxDA's first annual Interaction Design Award, in the "Disruptive" category, for his work with Ford Motor Company. His work is included in the permanent collection of the Museum of Modern Art. He appears in a number of documentary films on design, including the award winning 2020 Life on Wheels.

Turn design education upside down

Dan Formosa Ph.D.



I am invited occasionally to guest-lecture at industrial design schools, about design, research, and usability. Upon visiting every school representative provides a similar description of their program. It goes something like “We’re different from past, traditional industrial design programs. We’re all about understanding people. We take a human-centered approach.”

Me: “Oh, that’s great. Do you require courses in ergonomics or biomechanics?”

Them: “No.”

Me: “How about psychology?”

Them: “No.”

Me (wondering): “Well if you’re not about the physical body, and not about the mind, what part of the human are you about?”

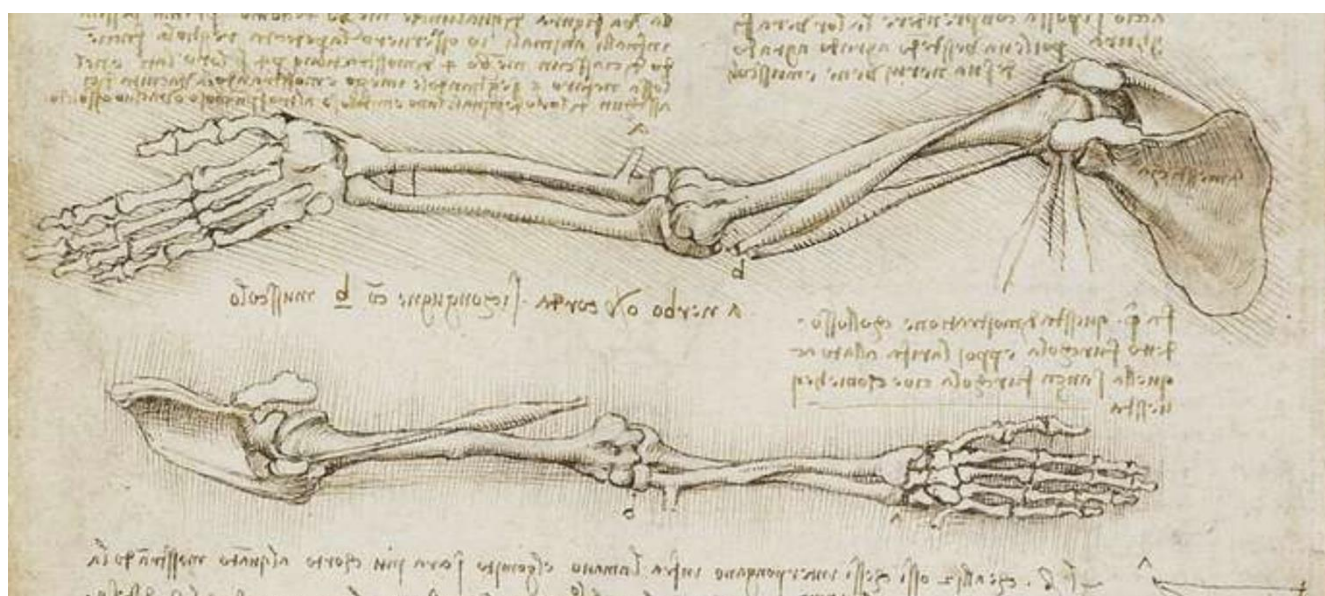
Being truly inclusive requires knowledge in a wide range of human-centered topics. A review of industrial design programs,

even at some of the best design schools, reveals a pattern that's unlikely to get us there. First year classes provide an introduction to design. Required courses may include drawing, color, 3-dimensional modeling, design history, and sometimes a class about art and culture. There may or may not be requirements for elective courses – classes outside the design department. Within the department there may be a single required course focused on human understanding, although it's rare. When it does occur it's just that - a single course. It's not a plan for inclusivity.

Topics to include

In my talks I typically discuss physical aspects of products as they relate to usability. And because there's a lot for students to absorb in the 60- to 90- minute time slot that's usually allocated for the talk, I'm at least hoping to instil awareness of the importance of these topics – or in some cases simply their existence. The talks implant the idea that if products are going to be usable, and inclusive of people who may not have the same physical abilities as others, then an understanding of basic physics, along with the body-mechanics involved even in simple tasks, need to be incorporated early in the design process. My discussion of physics includes a quick overview of weight, gravity, and balance. A poorly balanced hand tool will require more work to operate and can cause someone to be less accurate in its use because the hand is also trying to control its out-of-balance weight. An understanding of leverage is also important. Many hand tools are designed to provide a mechanical advantage. A waiter's corkscrew for instance provides leverage that helps extract a cork from a bottle of wine. It puts waiters' fingers on the mechanically advantaged end of a lever, with the corkscrew situated between the fingers and a pivot point positioned on the far edge of the bottle's mouth. In simple math, the ratio of the distances, pivot-point-to-fingers divided by

pivot-point-to-corkscrew, defines the mechanical advantage. For a waiter's corkscrew, it's usually on the order of 3-to-1. For many products we encounter everyday, leverage determines usability. Some products place a person on the short end of a lever. A broom handle, for instance, puts a person's hands on the short side– a disadvantage in leverage but with the advantage that a shorthand movement allows a wide sweep of the bristle end of the broom. Using a wooden spoon to stir something in a pot is similar – small wrist movements result in lots of stirring.



This is all elementary. However, it's clear that many of the students have never thought about, understood or considered these basic principles. My talk eventually leads to the fact that every bone in a body is controlled by muscles that mechanically are on the short side of a lever. Because of that, forces within our bodies are surprisingly high. Biceps, a major muscle in the upper arm causing the arm to bend at the elbow, is attached to one of two bones in the forearm. The biceps' attachment is close to the elbow's pivot point. The hand, and anything that it's holding, is at the opposite end, far from the pivot point. This requires the biceps to exert a lot of pulling force even for simple actions. Holding a 2-kilogram frying pan readily requires more than 30 kilograms of

muscle pull. (I should be reporting these forces in Newtons, but kilograms may be more relatable by most readers.) Usually these pull forces present no problem; our bodies are designed to work this way. However not all bodies are alike. Some people may not have enough strength and will either be unable to perform common tasks or may tire more readily. Tiring can lead to accidents. Dropping things in the kitchen is a common complaint among people with arthritis, for instance – pinching and gripping can be difficult.

Cognition

Cognitive issues are also important to address –considerations include the fact that:

- *instinct has an overriding influence. We are all pre-wired to react in specific ways.*
- *shapes of a product or a product's components can readily communicate their function. Or not – shapes can either help or be misleading.*
- *preconceptions about a product can cause misuse. A product in a person's past, even if not related to the product at hand, can lead to a person's unexpected behavior.*
- *stress has an effect. Self-injecting a medication can blur thinking – no one likes needles and clear thinking may be clouded by anxiety. Stress can be a factor even for common tasks – the need to take a picture quickly for instance can lead to some wrong button presses and a missed photo.*

Other human-centered topics in psychology important to consider include motivation, behavior, information processing, decision making and memory.

Anthropometry, physiology and other pertinent topics

Variations in the sizes of people (a.k.a. anthropometry, the measure of people) is a factor. Small hands and big hands will interact with a product differently, often to the disadvantage of smaller hands. Smaller hands can mean smaller not-as-strong muscles, and reaches that relegate use to fingertips, not stronger middle segments of the fingers. Understanding basics of biomechanics of the hand – the muscles involved, bones within the hands, range of motion, arm angles, wrist angles and the ability of each finger to contribute to a task, is critical to the design of products that will enable people. It will make those tasks easier, faster, more accurate, or for some people make those tasks possible at all.

The design of a hand tool doesn't stop with the tool – the fingers, wrist, forearm, upper arm and shoulder all need to be taken into account. Considerations for hand tools should start with the shoulder and end at the far “working end” of the tool. The body’s ability needs to be understood first. Mechanics of the hand and arm are rarely part of a design student’s education.

Visibility of a product, its components, or graphics on a product depends on size, color and contrast. For text and symbols, typeface and line weights will affect readability. Knowledge about the physiology of the eye can lead to products that accommodate a wider range of visual abilities, or usability in different lighting situations.

Literacy is another important topic in inclusivity. Instructions can be notoriously difficult to read and interpret. They may also be written in a person’s non-native language. Culture and language

are considerations, especially in the design of products that will be distributed globally.

Social and environmental issues also must be included in design. Products and services exist within a context. Cost as well, since a product can't be inclusive if its price is out of reach.

A brand's positioning is another factor. Successful brands don't just provide products – people are drawn to brands that stand for something. Inclusivity is an important characteristic of some brands. The products they offer need to support their mission, they are the best representatives of a brand's purpose. The business of brands, how a product can add to that brand's equity, is an aspect to be addressed in the creative process.

These are just some of the topics on the critical path to usability and the design of inclusive products. It is doubtful that someone can create successful, inclusive products and services without adequate knowledge in these topics. Few or none of these topics may be covered in current design curriculums.

Design is a group effort, and although there are many people behind the launch of a product the topics mentioned here need to fall within the realm of the designer. Designer Raymond Loewy is famously quoted as saying "Design is too important to be left to designers." We need to turn design education around to change that.

Is design education about to be reinvented?

Can these topics be covered within current curriculums in design schools?

If the thought “design is about people, not things” is to be realized, design education can benefit from a significant re-thinking. Current design curriculums need to be turned upside-down. To set a foundation for a people-based line of thinking, the first year of undergraduate design education should not be about design at all – at least not in the way most programs are set up now. The first year should be used to instill knowledge about people. Before students even start to design objects, services or interfaces, they should understand the people they are designing for. Design education need to establish a more holisticmindset, and establish it early.

The field of design over the last 40 years has focused on the process of design, methods employed to approach a design project step by step. Once considered unique (as evidenced by design firms in the late 1970s and throughout the 1980s diagramming their very similar “unique process”), the process of design has become a commodity, practiced more-or-less the same around the world. Looking ahead, designers need to focus on knowledge in design. Design can be a powerful force for change, but to fully realize its effect on people and society designers need to understand people.

A few schools in industrial design are offering some of this. Carnegie Mellon University’s design department requires industrial students to take a course in psychology in their first semester in the program, although it’s not within the design department. TUDelft requires a course in “Understanding Humans” in the first semester of the industrial design program. Such courses are not commonly required.

Perhaps I'm stating the obvious, that a human-centered education in design should start with the human. The aspirations of inclusive design are to make a difference. Design schools need to revise their programs to truly focus on understanding people. In the first year – don't wait, introduce basic human considerations as early as possible. Save the more traditional design courses for later, when those principles can be applied, and use that knowledge and mindset throughout the rest of the school program. And carry it into practice.

Rethinking design education is not a new idea. In their article "Changing Design Education for the 21st Century" (2020) Michael Meyer and Don Norman open with this:

"Designers are entrusted with increasingly complex and impactful challenges. However, the current system of design education does not always prepare students for these challenges. When we examine what and how our system teaches young designers, we discover that the most valuable elements of the designer's perspective and process are seldom taught."

Can change take place within current industrial design programs? Is it ironic that industrial design, a field promoting itself as master of change and innovation, would have difficulty reinventing itself. Or even shaking off the antiquated name "Industrial." (Although "product design" is commonly substituted, even that term places focus on the product, not the person.)

The publication *she ji*, a journal focused on economics, design and innovation, devoted a recent issue to design education. An article by Meredith Davis and Hugh Dubberly cautions:

"A field is less likely to reinvent itself when practitioners maintain an identity associated with a long-standing view of the field, as they do in design." Davis, M., & Dubberly, H. (2023).

If change cannot be undertaken by a field that bases its value on change and innovation, then it may be quicker to establish an entirely new human-design-based discipline. And come up with a new name for it. Any ideas?

References:

Meyer, M. W., & Norman, D. A. (2020). Changing Design Education for the 21st Century. She Ji: The Journal of Design, Economics, and Innovation, 6(1), 13-49.

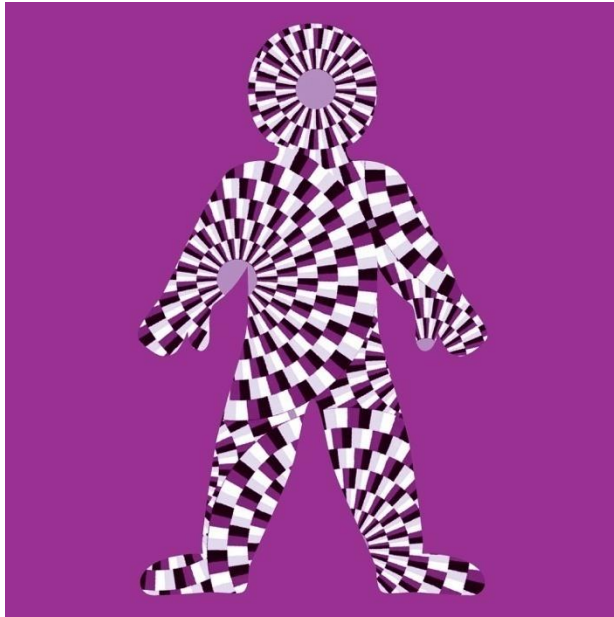
Davis, M., & Dubberly, H. (2023). Rethinking Design Education. She Ji: The Journal of Design, Economics, and Innovation, 9(2).



Dan Formosa Ph.D.

Dan consults with companies and organizations worldwide on design and innovation. An early proponent of "design for all" (a.k.a. Inclusive Design), he also lectures internationally on research and the future of design. He established his company ThinkActHuman with the goal of design for a better world. Dan holds degrees in product design, ergonomics and biomechanics. In addition to ThinkActHuman he co-founded 4B Collective, focused on design and gender, and co-founded the Masters in Branding program at the School of Visual Arts in New York.

He is the recipient of numerous awards, including Smithsonian's Cooper-Hewitt National Design Award (on behalf of Smart Design). He also received IxDA's first annual Interaction Design Award, in the "Disruptive" category, for his work with Ford Motor Company. His work is included in the permanent collection of the Museum of Modern Art. He appears in a number of documentary films on design, including the award winning 2020 Life on Wheels.



My chatbot has arthritis

Dan Formosa Ph.D.

As a product designer heavily involved in research I have spoken to and observed hundreds of people in usability studies and interviews, covering a wide range of product categories. A goal for the products, including consumer products and medical devices, among other usability challenges people may have, are designs appropriate for people who have arthritis.

Like many people, over the last year or so I have logged onto ChatGPT and Google Gemini for information, asking questions related to either professional or personal projects. Most were short Google-like question and answer sessions.

My assignment as editor for this issue of Design For All was to enlist a number of authors. For their articles authors reached out to various people for interviews. For this article I thought I would try an experiment. I reached out to a chatbot, Google Gemini, to see what AI can offer in an interview. Not just a quick information search, my plan was to carry on an extended conversation. In experimental fashion I started by asking if he/she/it (not sure of the proper pronoun for a chatbot) could respond as someone who has arthritis. I wasn't sure if this was possible, or what it would yield. Here is that session.

By no means do I regard chatbots as an alternative to real people (I'm a real-people person.) And as you'll see, the chatbot agrees. However, in conversation I was surprised at how knowledgeable the chatbot was. And how chatty!

My expectations were moderately high to start. But the chat was more informative, and more fun, than I expected. I did not edit at all my prompts or any of Gemini's responses. Here's that session:

My conversation with Gemini

Dan: *Are you able to respond to questions as if you are someone with a disability such as arthritis?*

Gemini: I can certainly try! To respond authentically, it would be helpful to know what type of arthritis and the severity. Arthritis affects people differently, but I can share some general responses that capture some of the challenges people with arthritis experience.

For example, if you ask me "Can you open that jar for me?" I might respond with:

- "Ugh, my hands are feeling stiff today. Would you mind giving that a twist? My arthritis is acting up."

Or, if you ask me "What do you like to do for exercise?" I might say:

- "I enjoy going for walks, but long distances can be tough on my knees. Low-impact activities are my friend these days."

Let me know if you have a specific scenario or question in mind, and I will do my best to craft a response that reflects the experience of someone with arthritis.

It's important to remember that everyone with arthritis is an individual, and their experiences will vary.

Dan: *Arthritis is sometimes characterized into three levels – slight, moderate and severe. Can you respond as someone who has moderate arthritis?*

Gemini: Absolutely! Having moderate arthritis can definitely make things interesting.

For instance, if you ask me to come for a hike, I might say:

- "I'd love to join you, but those hills might be a bit much for my knees today. Maybe we could find a flatter trail? There's this great path by the river I've been wanting to check out."

Or, if you hand me something heavy, I might respond with:

- "Oh, thanks! Let me just grab that with two hands – my wrists aren't too keen on carrying a lot these days."

On good days, I might be able to keep up with most activities, but there will definitely be some adjustments I need to make to manage my pain and stiffness. I also tend to get tired faster, so pacing myself is important.

Is there anything else you'd like to know about what it's like to have moderate arthritis?

Dan: *What are some of the common challenges you experience on a day-to-day basis?*

Gemini: With moderate arthritis, some days are definitely better than others. Here are a few challenges I face on a fairly regular basis:

- **Morning stiffness:** The first hour or so after waking up can be rough. My joints, especially in my hands and knees, feel like they're filled with cement. Simple tasks like getting dressed or making breakfast can take a bit longer as I wait for things to loosen up.
- **Pain with activity:** I can still be active, but I have to be mindful of it. Walking is great, but those hills you mentioned? Yeah, they can definitely trigger some aches. I also have to be careful not to overdo it, or I'll pay the price later with soreness and stiffness.
- **Surprise limitations:** There are times when I reach for something or go to do something and my body just says "nope." Maybe a jar lid is too tight, or a curb seems higher than usual. It can be frustrating, but I've learned to have some backup plans and be flexible.
- **Fatigue:** Even on good days, I tend to tire out faster than people without arthritis. Planning activities often involves factoring in rest breaks. Sometimes, a simple trip to the grocery store can leave me needing to put my feet up for a while.

- **Impact on sleep:** Sometimes the pain or discomfort can make it hard to get a good night's sleep. This lack of sleep can then make the next day's challenges even tougher. Finding ways to relax and manage pain before bed is important.
- **Mental game:** Arthritis can be a bit of a mental battle. There are days when the pain or limitations can get me down. But I try to focus on what I can do, stay active, and not let it define me.

These are just some of the things I deal with on a day-to-day basis. The good news is that there are ways to manage arthritis, and I've found that a combination of medication, exercise, and a positive attitude goes a long way.

Dan: *What about activities in the kitchen - cooking or preparing food, cleaning?*

Gemini: The kitchen can definitely be a battleground for someone with moderate arthritis. Here's a glimpse into what it might be like for me:

- **Chopping and prepping:** Gripping a knife for long periods can aggravate my hand and wrist pain. I try to use tools with thicker handles for better leverage, and take breaks to avoid overdoing it. Sometimes, I enlist help from family members or pre-cut veggies to save my hands the stress.
- **Lifting heavy pots and pans:** Those hefty cast iron skillets might look fancy, but they're not my friend. I've switched to lighter weight cookware made from aluminum or even silicone. Double-handled pots are a lifesaver, as they distribute the weight more evenly.

- **Reaching for things:** Those top shelves? Yeah, not happening most days. I've reorganized my cabinets to keep frequently used items within easy reach, at eye level or below. For higher shelves, I use a grabber tool to avoid that painful stretch.
- **Standing for long periods:** Kitchen duty often involves a lot of standing, which can be tough on my knees. I've invested in a comfy anti-fatigue mat to provide some cushion and reduce stress on my joints. Also, I pull up a stool to perch on while prepping or doing dishes whenever possible.
- **Cleaning:** Scrubbing greasy dishes can be a nightmare for sore hands. I wear padded gloves for some protection, and try to use hot, soapy water to loosen grime so I don't have to scrub as hard. Anything with a non-stick surface is a godsend!
- **Planning is key:** Spontaneous cooking sessions are less frequent these days. I tend to plan meals in advance, considering what prep work I can manage without too much strain. Using slow cookers or one-pot meals are lifesavers on days when my arthritis is acting up.

It takes a little more creativity and planning to navigate the kitchen with arthritis, but there are ways to make it work. Sometimes, a little help from family or friends goes a long way too!

Dan: *Are you having any trouble with specific items in the kitchen?*

Gemini: Sure, with moderate arthritis, some kitchen items can cause more trouble than others. Here are a few that cause me problems:

- **Jar openers:** Those lids can be like torture chambers for my hands! Twisting them can be difficult and painful. I rely on jar openers with rubber grips or silicone pads to give me a better hold and more leverage.
- **Heavy can openers:** The squeezing motion can aggravate my hand and wrist pain. An electric can opener is a lifesaver and eliminates the need for gripping or twisting.
- **Peeling fruits and vegetables:** Gripping a small peeler can be tricky, and sometimes requires a lot of hand strength. I use peelers with large, soft handles for better leverage, or even silicone oven mitts for extra grip.
- **Small, lightweight cutlery:** These can be difficult to hold onto, especially with stiff or sore hands. Utensils with thicker, ergonomic handles are much easier to manage.
- **Anything requiring a pinch grip:** Opening certain packages or handling small containers can be a challenge. I try to use scissors whenever possible to avoid pinching with my thumb and forefinger.

By using adaptive tools and making some substitutions, I can still get by in the kitchen. The key is to find what works for me and to not be afraid to ask for help when I need it.

Dan: *What about pots and pans?*

Gemini: Here are some challenges I face with pots and pans due to moderate arthritis:

- **Heavyweight cookware:** Cast iron skillets, Dutch ovens, even full stock pots of water can be heavy and cumbersome to lift, especially with sore wrists or hands. I've opted for lighter options whenever possible, like aluminum or even silicone cookware.
- **Unbalanced pots:** A pot with a single handle can put all the weight on one arm, which can be tough on my shoulders. Double-handled pots are a lifesaver, as they distribute the weight more evenly and make lifting and pouring easier.
- **Tight-fitting lids:** Heavy or cumbersome lids can be difficult to grip or remove, especially if my hands are stiff. I look for lids with large knobs that are easy to grasp, or even silicone lids that create a seal without needing to be pressed down hard.
- **High sides:** Peering over high pot sides to stir or check food can strain my neck, especially if I'm already dealing with pain. I tend to use wider, shallower pans whenever possible, or I use a grabber tool to stir or toss food without having to reach in too far.
- **Hot handles:** Grabbing a hot pot handle can be painful, especially if I have limited grip strength. I use silicone potholders that offer better heat protection and a secure grip. Some pans even have heat-resistant handles which is a big plus.

Dan: *If a pinch grip is difficult, do you find that you are dropping things more frequently?*

Gemini: Absolutely, having difficulty with a pinch grip is a major contributor to dropped items. Here's why:

- **Reduced control:** The pinch grip relies on the thumb and fingers working together precisely. With arthritis, stiffness, weakness, or pain can make that coordination challenging. My grip feels less secure, so things can easily slip out of my grasp.
- **Unexpected weakness:** Arthritis pain or stiffness can sometimes come on suddenly. I might be holding something and then experience a twinge that causes me to loosen my grip unintentionally, leading to a drop.
- **Everyday tasks:** Picking up a cup, grabbing a phone, even holding onto silverware all rely on a pinch grip. When that grip is compromised, even the most routine tasks can become precarious, and drops become more frequent.
- **Frustration and fatigue:** The constant struggle to maintain a good grip can be tiring and frustrating. This fatigue can sometimes lead to carelessness or moments of inattention, which can also contribute to dropped items.

It's definitely a challenge, and something I have to be constantly aware of. That's why I try to use tools that can help, like grippers for jars or silicone pads for utensils, to give me a better hold on things. I also take my time and focus on my grip when picking things up.

Even with these strategies, dropped items are still a reality of life with moderate arthritis. But it's important to stay positive and not let it discourage me. I just pick things up, dust myself off (metaphorically speaking!), and keep going.

Dan: *What's your name and gender?*

Gemini: I don't actually have a name or gender! As a large language model, I am not a person. I can respond to prompts and

answer your questions in a way that simulates a person with a particular background or disability, but I don't have my own experiences or feelings.

Is there anything else you'd like to know about how arthritis might impact daily life?

Dan: *Are you responding as a male or female, and does gender make a difference for common kitchen tasks?*

Gemini: I apologize, attributing a gender to myself wasn't appropriate. You're right, gender itself likely doesn't cause a significant difference in the way people experience common kitchen tasks.

Social norms and cultural expectations might influence how often people perform certain tasks, but the physical limitations of moderate arthritis would apply regardless of gender.

Studies do suggest a slight difference in approach:

- **Gadget Use:** Some research suggests men might be more inclined to use specialized kitchen gadgets, while women may rely more on basic utensils.
- **Spice Preference:** There may be a difference in commonly used spices, with men favoring bolder flavors and women leaning towards everyday spices.

However, these are generalizations, and the most significant factor impacting kitchen tasks with arthritis is likely individual preferences and cooking styles, not gender.

Dan: *What about age?*

Gemini: Age can definitely play a role in how arthritis affects someone in the kitchen. Here's how it might differ for someone younger versus someone older with moderate arthritis:

Younger (30s-50s):

- **Overall Strength and Endurance:** Younger individuals with arthritis might still have a bit more overall strength and stamina compared to older adults. This could allow them to manage tasks like lifting heavier pots or stirring for longer periods.
- **Work Adaptations:** Younger people might still be actively working, and their jobs might influence their ability to handle kitchen tasks. A physically demanding job could exacerbate arthritis symptoms, making kitchen activities more challenging.
- **Activity Level:** Younger adults might generally have a higher baseline activity level, and this could translate to a better tolerance for some kitchen tasks despite arthritis. They might be able to push through stiffness or pain for a short period to get things done.

Older (60s+):

- **Joint Deterioration:** As we age, the natural wear and tear on joints can be more pronounced. This could mean more limitations in flexibility, range of motion, and overall strength, making even simple kitchen tasks more difficult.
- **Multiple Conditions:** Older adults are more likely to have other health conditions alongside arthritis. These can combine to create additional challenges in the kitchen. For instance, reduced eyesight might make chopping vegetables a safety hazard.
- **Reduced Recovery Time:** Recovery from exertion or pain might take longer for older adults. This could limit their

ability to perform long stretches of kitchen work and necessitate more frequent breaks.

It's important to remember that these are just general trends. There will always be individual variations. A very active 65-year-old with well-managed arthritis might navigate the kitchen with more ease than a less active 40-year-old with severe symptoms.

Dan: *My previous questions were about the kitchen, but are there other common tasks that may be difficult?*

Gemini: Absolutely! Arthritis, especially moderate arthritis, can make a variety of everyday tasks more challenging. Here are some common areas where you might see difficulties:

Personal Care:

- **Dressing:** Reaching for buttons, zippers, or putting on socks can be difficult with stiff hands or sore shoulders. People with arthritis often look for clothes with easy-open closures like elastic waistbands or slip-on shoes.
- **Grooming:** Simple tasks like brushing hair, shaving, or applying makeup can be hindered by pain or limited range of motion in the hands and wrists. Tools with long handles or ergonomic grips can be helpful.
- **Bathing:** Getting in and out of the shower or tub can be risky, especially with slippery surfaces. Grab bars, shower seats, and hand-held shower heads can all improve safety and independence.

Daily Activities:

- **Housework:** Activities like vacuuming, sweeping, or mopping can be strenuous on joints, especially knees and

hips. Using lighter weight tools or delegating chores can help.

- **Climbing stairs:** Stairs can be a major obstacle for people with arthritis in their knees or hips. Handrails are essential, and some people may need to consider installing a stairlift for their home.
- **Carrying groceries:** Lifting heavy bags can be a recipe for pain. Shopping carts or using grocery delivery services can be lifesavers.

Leisure Activities:

- **Gardening:** Tasks like digging, weeding, or pruning can be difficult with limited hand and wrist mobility. Raised garden beds and ergonomic tools can help make gardening more manageable.
- **Sports and exercise:** While staying active is important with arthritis, high-impact activities like running or jumping might be too harsh on joints. Low-impact exercises like swimming, walking, or yoga are often better options.

It's important to remember that these are just a few examples, and the specific difficulties will vary depending on the type and severity of arthritis, as well as the individual's overall health and lifestyle. However, with a little creativity and some adjustments, most people with arthritis can still find ways to manage these daily tasks and live fulfilling lives.

Dan: *For dressing (buttons, zippers, etc.) have you found any products that can assist, or that are easier to use when dressing yourself?*

Gemini: Yes, there are several products that can assist people with arthritis when dressing, especially with buttons and zippers. Here are a few of the most common:

- **Button hook:** A button hook is a small, handheld tool with a curved hook on one end. It helps you to loop the buttonhole over the button without having to use your fingers or pinch grip.



Opens in a new window



americanduchess.com

Button hook

- **Dresser helper:** A dressing helper is a long, narrow tool with a hook on one end and a gripper on the other end. The hook can be used to pull up zippers and the gripper can be used to grab clothing and pull it on or off.



Opens in a new window



www.amazon.com

Dresser helper

- **Reachers:** Reachers are long-grabbing tools that can be used to pick up clothing from the floor or to pull on socks and shoes. They come in a variety of lengths and styles.



Opens in a new window 

www.ncmedical.com

Reachers

- **Elastic shoelaces:** Elastic shoelaces can be used to replace regular shoelaces. They allow you to put on and take off shoes without having to tie or untie the laces.



Opens in a new window 

amazon.com

Elastic shoelaces

- **Clothes with easy-open closures:** Look for clothes with features that make them easier to put on and take off, such as shirts with zipper closures or pants with elastic waist bands.

These are just a few examples, and the best products for you will depend on your specific needs and preferences. It is also a good idea to talk to your doctor or occupational therapist for recommendations.

Dan: *Do you have any complaints or difficulties when using a smartphone?*

Gemini: Absolutely! Using a smartphone with moderate arthritis can definitely be frustrating at times. Here are some of the common challenges I face:

- **Small screen and buttons:** Tiny icons and close-together buttons on the touchscreen can be difficult to see and target accurately, especially with stiff fingers. Pinching and zooming can be tiring and sometimes imprecise.
- **One-handed operation:** While many tasks can be done with one hand, some require swiping or pinching with both thumbs, which can be painful or difficult with limited dexterity.
- **Typing:** Swiping or tapping on the keyboard can be awkward and slow, especially if my fingers are swollen or stiff. Swype keyboards or voice recognition can be helpful alternatives, but they aren't perfect.
- **Weight and grip:** Smartphones can be surprisingly heavy, and holding them for extended periods can strain my hands and wrists. Cases with grippy textures or pop sockets can

help improve my grip and reduce the risk of dropping the phone.

- **Stiffness and responsiveness:** The first thing in the morning, my hands might be stiff, making it hard to use the touchscreen accurately right away. I've learned to be patient and wait for things to loosen up a bit before using my phone extensively.

These challenges can definitely make using a smartphone less enjoyable and sometimes even a bit stressful. However, there are some features and settings that can help:

- **Accessibility settings:** Most smartphones have built-in accessibility features that can be helpful for people with arthritis. These can include things like increased font size, bolder text contrast, and voice control options.
- **Large-icon mode:** Many phones allow you to switch to a "large-icon mode" which makes app icons and text larger and easier to see and tap on.
- **Voice assistants:** Virtual assistants like Siri or Google Assistant can be a great way to control your phone with your voice instead of your fingers. You can use voice commands to make calls, send texts, set reminders, and more.
- **Stylus pen:** Using a stylus pen can improve your accuracy when tapping or swiping on the screen, especially for tasks like handwriting recognition or drawing.

By using these tools and being patient with myself, I can still use my smart phone to stay connected, get things done, and even have some fun. Arthritis might slow me down a bit, but it doesn't have to stop me from using the technology I enjoy!

Dan: *What about other electronics in your house – television controls for example?*

Gemini: You're right, television remotes can definitely be a challenge with moderate arthritis. Here's how they can cause some trouble:

- **Small buttons:** Those tiny buttons on a standard remote can be difficult to grip and press, especially if my fingers are stiff or swollen. My thumbs might not have the dexterity to hit the exact center of the button every time, leading to frustrating missed presses.
- **Multiple buttons:** Having so many buttons crammed together can be confusing and overwhelming. Trying to find the right button quickly can be a struggle, especially if the labels are small or not backlit.
- **Shape and weight:** Traditional remotes are often thin and lightweight, which might sound good, but they can be tricky to hold onto securely with limited hand strength. A smooth, plastic surface can also be slippery for arthritic hands.
- **Reaching for the remote:** Bending over or reaching for the remote on the coffee table can be painful for sore shoulders or a stiff back. Sometimes, the remote seems to mysteriously disappear just when I need it most!

Here are some ways I've learned to cope with these remote woes:

- **Big Button Remotes:** These lifesavers have large, clearly labeled buttons that are easy to see and press. They might have fewer buttons overall, focusing on the most commonly used functions. Some even have backlighting for night time use.

- **Universal Remotes:** These can be programmed to control multiple devices like the TV, cable box, and sound system. This reduces the clutter of multiple remotes and allows for fewer buttons to learn.
- **Voice Control:** Many TVs and cable boxes now have voice control features. This allows me to control the volume, change channels, or even search for programs using my voice, eliminating the need for the remote altogether.
- **Remote Holsters:** These handy devices attach to the armrest of your couch or chair, keeping the remote within easy reach and preventing those frustrating "lost remote" moments.
- **Smartphone Apps:** Many cable providers and streaming services offer apps that allow you to control your TV with your phone. This can be a good option if my hands are feeling particularly sore on a given day.

By utilizing these options, I can navigate the television with more ease and less frustration. Arthritis might make using the remote a bit of a chore, but a little creativity and some helpful tools can go a long way!

Dan: *Are there any problems using appliances, such as a microwave oven or a dishwasher*

Gemini: Even with moderate arthritis, using appliances like microwaves and dishwashers can be manageable, but there can be a few hurdles to overcome. Here's how:

Microwave:

- **Reaching for buttons:** The control panel on a microwave, especially if it's mounted overhead, can be difficult to reach

for someone with limited shoulder mobility. Microwaves with lower-mounted controls or those with accessible buttons on the door can be easier to use.

- **Setting the timer:** Those tiny buttons for setting the timer can be fiddly with stiff fingers. Look for microwaves with larger buttons or even touchscreens that allow for easier selection of time.
- **Lifting heavy dishes:** Taking a hot dish out of the microwave can be tricky, especially if it's heavy and awkward to handle. Using microwave-safe potholders or mitts with good grip is essential. Consider using lighter weight dishes in the microwave whenever possible.

Dishwasher:

- **Loading and unloading:** Bending down to load and unload the dishwasher can strain your back and knees. Pull-out racks at the bottom can make reaching the back easier. You can also use a stool to sit down while loading or unloading.
- **Heavy dishes:** Similar to the microwave, lifting heavy dishes in and out of the dishwasher can be difficult. Consider using a dishwasher basket specifically designed for silverware and lightweight items, reducing the weight you need to lift in each hand.
- **Rack adjustments:** Adjusting the racks in the dishwasher can be tough if the knobs are stiff or require a pinching motion. Look for dishwashers with easy-grip handles or levers for adjusting the racks.

Dan: *If I am designing a product, such as a basic hand tool, how can I best develop new ideas that can help people with arthritis?*

Gemini: Here are some general tips that can help with using appliances and managing arthritis:

- **Keep frequently used items within easy reach:** Store dishes, utensils, and cleaning supplies you use often in lower cabinets or drawers to avoid excessive bending or reaching.
- **Utilize adaptive tools:** There are many tools available to help people with arthritis manage everyday tasks. For example, gripper pads can improve your grip on slippery surfaces or jar openers can help you twist lids without straining your hands.
- **Delegate tasks:** Don't be afraid to ask for help! If you live with family or have close friends, delegate tasks like loading the dishwasher or reaching for high cabinets.
- **Listen to your body:** Don't try to push yourself too hard. If you're feeling pain or stiffness, take a break and come back to the task later.

By being mindful of these challenges and utilizing some simple strategies, you can still use appliances like microwaves and dishwashers effectively, even with moderate arthritis.

Here are some key strategies you can use to develop new ideas for hand tools that can help people with arthritis:

Understanding the User:

- **Research:** Conduct user research to understand the specific challenges faced by people with different types and severities of arthritis.
 - Talk to occupational therapists or doctors who specialize in arthritis.

- Look for online forums or support groups for people with arthritis.
- **Observe and Prototype:** Observe people with arthritis using existing tools. Watch for any difficulties they encounter and identify areas for improvement. Develop low-fidelity prototypes (e.g., cardboard cutouts) to test different design concepts with potential users and get their feedback.

Focus on Pain Points:

- **Grip and Dexterity:** Many people with arthritis struggle with grip strength and limited dexterity. Focus on designing tools with large, comfortable handles that are easy to grip and require minimal pinching or twisting motions. Consider incorporating rubberized or textured surfaces for improved grip.
- **Reduced Reach:** Reaching for tools or applying a lot of force can be difficult. Design tools that are lightweight and require less effort to use. Explore features like extendable handles or built-in levers to reduce the reach and force required.
- **Minimize Stress:** Repetitive motions or awkward postures can exacerbate pain. Design tools that promote a neutral hand position and reduce the need for sustained force or awkward grips.

Think Beyond the Tool:

- **Multifunctionality:** Consider designing tools that can serve multiple purposes, reducing the number of tools needed and minimizing the need to switch grips or reach for different tools.

- **Ease of Use:** Design with simplicity in mind. Clear instructions, minimal moving parts, and easy cleaning are all important features for people with arthritis.
- **Customization:** One size does not fit all. Explore features that allow for customization, such as adjustable handles or interchangeable attachments, to cater to different hand sizes and grip strengths.

Examples of Design Features:

- **Rocker blades or rollers:** These can replace the need for squeezing motions on tools like can openers or jar openers.
- **Trigger grips:** These can be easier to use than traditional squeeze grips for people with limited hand strength.
- **Magnetic pick-up tools:** These can eliminate the need to bend down and pick up dropped items.
- **Weighted bases:** These can provide stability for cutting tools or other items that might be difficult to hold steady.

Additional Tips:

- **Partner with Occupational Therapists:** Collaborate with occupational therapists who can provide valuable insights into the specific needs of people with arthritis and the types of tools that can be most helpful.
- **Consider Aesthetics :** Don't sacrifice design for functionality. Create tools that are not only helpful but also visually appealing and comfortable to use.
- **Test and Refine:** Continuously test your prototypes with potential users and incorporate their feedback into the design process.

By following these strategies and focusing on the specific needs of people with arthritis, you can develop innovative hand tools that make everyday tasks easier and less painful.

Dan: Thank you, that was great. Can I come back to you later with more questions after I have had a chance to think about your responses?

Gemini: You're welcome! I'm happy to help in any way I can. Absolutely, feel free to come back with any further questions you may have about arthritis or designing products for people with arthritis. I will do my best to answer your questions based on the information and data I have been trained on.



Letter from the Chairman's Desk By Sunil Bhatia PhD

One night I felt my urine bladder was full and experienced strong pressure to relieve it. As I got up in half sleep and tried to wear my rubber slipper I experienced my right foot was in the wrong left slipper. I experienced difficulty in walking but I thought it was a small distance of going to the attached washroom and hardly needed corrections of slipper. I was not properly woken up and under dizzy sleep; my slipper was designed to guide me to insert the proper feet into the correctly designed slipper.

My sleep was disturbed and thought about the product that keeps guiding the users. I found my pillow cover is designed in such a way it will cover only when we insert the pillow from the open mouth of the cover and the same with the quilt cover. It is the design that guides the users in achieving the desired goal of covering if it follows the inbuilt design instruction of the cover.

The basic principle of designing the products that should guide the users in achieving goals for it is designed is to use all possible combinations that users are familiar with in the past. It is not a new idea but it was in the practice of our primitive peoples 's minds our ancestors for achieving designed products where the scope of improvement is lowest but ultimate products were those that have an inbuilt mechanism of guiding the users.

I found myself in various situations in daily life where I experienced products were not functioning and I did not know how to advance further. In that situation, my intuition kept guiding me. Intuition developed and sharpened what we did in the past.' To solve the problem my mind only thinks about how I solved a similar situation in the past and we call it trial and error. Mostly it works and I advanced. It is not possible all the time for my past experiences to guide me properly. Sometimes I advance but find a stumbling block after a few steps so I retreat my steps and take other possible options for removing that block in the future. This helps in enhancing new knowledge in my memory for designing new skills of intuition. My slipper has the simplest design where one line strap is for holding my toe and toe finger and the other two joined straps are fixed with the sole of the slipper at the foot bed close to my heel. It guides the users to insert their feet forward as they walk in by slipping inside the strap. The sole of the slipper has a left and right design that matches the sole with the right leg with the right slipper and the left with the left side of the slipper. This small design change for distinguishing the left and right side of the feet is the guiding force for users to insert the proper feet in the slipper it is designed. There is only a wide opening for slipping of the feet from the foot bed of the slipper and no one can insert feet from the other way. It is the design that guides the users to place proper feet at the opening for wearing slippers.

Another situation was when I was spreading a bedsheet over the bed and my friend who was watching was confused by saying it is not proper side what you are spreading. He further added by justifying his argument "Look at the color it is faded and the design is properly highlighted on another side." I was confused and then looked at the interlocking of the bedsheet that guided

me to select the proper side for spreading the sheet. It was the design of all sides of the interlocking that helped in identify and make me select the proper side. It is human nature to hide the unwanted in such a way it should not spoil the beauty for that is designed and interlocked was placed with the same philosophy in the product.

Wherever a product fails to guide the users it creates funny situations and motion pictures use this for comedy. The audience is aware of how to fix the problem but the actors do that what the audience did not expect and it turns out matter of laughing. It was visible in Charlie Chaplin's films where he is fixing something with the help of nails by hammering. His friend found he was not properly able to reach for the hammering he guided him to stand on a placed stool near him for fix by hammering. He lifted the stool and placed it over the nail for striking with the hammer. That generated humour.

With the latest technology automobile manufacturers eliminated the element of confusion of proper use of gear, clutch, and accelerator by users for proper controlled driving of the vehicle for proper synchronized functions for avoiding collision on the road with other vehicles by introducing the auto-clutch and selection of gear for proper speed. They eliminated the manual operation. It is the product that helps in guiding the users with its inbuilt mechanism. Elimination of user confusion was the foundation for automation.

There is no accident possible when the train is running on a dedicated railway track and each direction has separate tracks. Confusion surfaced same tracks are used for reaching certain common passage tracks for various routes. They designed a

system where the station master called the succeeding stationmaster releases of metal ball that is operated with a battery and releases when both act simultaneously. The driver is guided by a ball. His duty is not to advance without carrying the proper ball for the next station. That eliminated the possibility of accident by collision.

Smell is the most powerful sense of living beings in guiding for propagating life and it is the reason for the beginning of life and it lasts till its death. One of my friends who are doctor once informed me that the reason for the beginning of our life is male sperm reaches to woman's egg and keeps releasing chemicals called chemoattractants, which leave a sort of chemical breadcrumb trail that sperm use to find unfertilized eggs. Scent guides the sperm to locate the egg for ovulation. A woman's egg doesn't always agree with her choice of partner but selects the best sperm out of millions. He said I have found a man who was crushed under a heavy truck but his smell organs were the last to go we tried to save his life by giving him medicine in vapor form and it worked and gradually signs of life started surfacing and in a few months he came back to original life. Flowers release scents to guide the insects for pollination. Animals locate the lost family members or males for mating the female by smelling the urine that keeps guiding for tracing the desired objects.

Our scientists have used the concept of smell in various places by training sniffer dogs to locate untraced hiding bombs or murder clues. Sniffer dogs, also known as detection dogs, are trained to use their senses to detect substances. They can be used to detect: Explosives, Illegal drugs, Wildlife scat, Currency, Blood, and Contraband electronics like mobile phones. The latest is honey bees trained to identify the drugs at the time of scanning of

luggage of passengers by machines. They are trained to come out from the living place as that particular scent strikes their sensory organs even if it is cased in a suitcase. The actions of bees alert the authorities to check the specific luggage for locating drugs. Sniffer bees, also called sniffer wasps, can be trained to detect substances such as explosives, illegal drugs, and some plant and human diseases.

The latest smartwatch is where the user's various crucial body functions are indicated on the screen of the watch and any unusual supposed to happen signals the users to take care of that may prove fatal. Users are constantly under the monitor and guide for proper actions.

One day my personal vehicle's headlight went off and my driver refused to drive in the night and informed visibility is zero and difficult to drive. While sitting in an automobile I realized the product of a headlight that guides the users to avoid damage to the vehicle or people sitting in the vehicle. We have a continuation of civilizations despite on many occasions witnessing many gaps in history where we do not know how mankind has progressed to the present situation. My answer of product guides the user's concept has helped us in attaining our so-called modern status. Nature has two important factors. One is dark which has played a significant role in the formation of life. The seed is placed in earth soil for darkness or grafting needs darkness for the shooting of roots if we make appropriate cuts on the stem and cover it with a mixture of soil and cow dung for a few days. Similarly, human sperm or animals propagate life in the dark. The darkness has guided humans to invent techniques for serving the purpose of light that should illuminate your local areas. The enemy of the beginning of life is light. The light was in nature in the form of fire.

Fire properties kept guiding our ancestors for various applications. Fire has two important properties one is heat and the other is light. Use of heat was used for scaring the prey and later on mass destruction. The use of the properties of light made them think of designing of torch and oil lamp. A torch is a long piece of wood with burning material at the end that you carry to give light. This management of the art of fire made humans the most powerful creatures more than the creator of the universe. This fire guides the users in the management of fire that is made superior and eliminates the distinction between dark or night or day and night for progress. The design of the headlight of the automobile was an extension and continuation of the application of the torch. Without the headlight of the vehicle at night made me think of living in primitive times life.

I am thankful to Dr. Dan Formosa who was Guest Editor in the past after the request of the IDSA chairman for accepting our invitation. This is the first time he is collaborating with us on an individual level. He is the recipient of numerous awards, including the Smithsonian's Cooper-Hewitt National Design Award (on behalf of Smart Design). He also received IxDA's first annual Interaction Design Award, in the "Disruptive" category, for his work with Ford Motor Company. His work is included in the permanent collection of the Museum of Modern Art.

Lambert Academic publication for celebration of the 150th special issue by publishing a book by compiling editorials "Design For All, Drivers of Design" in two sets Drivers of Design Drivers of Design Volume-II was translated into eight different languages from ENGLISH to French, German, Italian, Russian, Dutch, and Portuguese. Kindly click the following link for the book.

"Morebooks", one of the largest online bookstores. Here's the link to it:

<https://www.morebooks.de/store/gb/book/design-forall/isbn/978-613-9-83306-1>

Second Volume :

http://www.morebooks.shop/bookprice_offer_74414a1df61c3d2ea8bf46ae7e3c0cf31769f261?locale=gb&cy=EUR

Enjoy reading, be happy, and work for the betterment of society.

With Regards

Dr. Sunil Bhatia

Design For All Institute of India

www.designforall.in

dr_subha@yahoo.com

Tel 91-11-27853470®



Forthcoming Issues

April 2024 Vol-19 No-4



Dr. Shatarupa Thakurta Roy has studied Fine Arts in Visva Bharati University Santiniketan and did her doctoral research in Visual Culture from the Department of Design, Indian Institute of Technology Guwahati.

She is currently working in the Discipline of Fine Arts, Department of Humanities and Social Sciences as an Associate Professor engaged in teaching and research in the area of Art and design. She is a painter and print maker with many national and international exhibitions to her credit.

May 2024 Vol-19 No-5**Prof JP OdochPido**

Prof Odoch Pido is a design educator and professional designer. He is an Associate Professor of Design at the Department of Design and Creative Media, the Technical University of Kenya. He has served on numerous administrative positions, boards and committees, setting curricula and judging Kenyan art and design projects and competitions. He has been a strong force in the preparation and development of more than five generations of Kenyan designers as they make their first halting steps and then flourish as professionals. His many professional credits include exhibition designs, graphic design and product development. Odoch's many publications include papers and chapters in books, conference presentations and journal articles focusing on the deep analysis of culture in relation to design, emerging trends in cultural expression, health and development. He has concentrated on issues in design education but the closest to his heart has been alternative communication techniques for controlling HIV-AIDS, especially for orphans and vulnerable children in rural Kenya. Together with other scholars he is examining groundswell as a cultural revolution in weddings and connecting African thought

system with mainstream philosophy, design and related disciplines. Odoch's photography of abstract forms in nature is his way of expressing his sensitive vision by focusing on small scale natural beauty that might otherwise go unnoticed.

June 2024 Vol-19 No-6



Per-Olof Hedvall works as Director of Certec, Department of Design Sciences, Lund University, Sweden. His research deals with accessibility, participation, and universal design, with a particular interest in the interplay between people and technology. Working closely with the disability movement, he focuses on people's lived perspectives and how human and artefactual aspects of products, services, and environments can be designed to support people in fulfilling their needs, wishes, and dreams. Hedvall has a background in computer engineering and has a particular interest in people's empowerment and opportunities for participation in their lives.

Per-Olof Hedvall often bases his work on Cultural-Historical Activity Theory. In 2009, Hedvall defended his doctoral dissertation in Rehabilitation Engineering and Design, "The Activity Diamond – Modelling an Enhanced Accessibility", where he developed a model for planned, lived, and long-term aspects of accessibility, as a prerequisite for participation.

July 2024 Vol-19 No-7



Dr. George Vikiru is a Lecturer in the Department of Fine Art and Design, School of Law, Arts and Social Studies, Kenyatta University, Nairobi, Kenya.

His areas of specialization are Textiles and Graphic Design with an emphasis on the utilization of the New Media Arts for Effective Communication and Social Transformation. His other areas of interest are in Indigenous Knowledge, gender, technology and media studies. Dr. Vikiru has had over twenty five years teaching experience at University where he has also carried out research, published widely and gained managerial experience.

August 2024 Vol-19 No-8



Dr. Bijaya K. Shrestha received Doctoral in Urban Engineering from the University of Tokyo, Japan (1995-'98),

Master in Urban Design from the University of Hong Kong, Hong Kong (1993-'95) and Bachelor in Architecture from the University of Roorkee (now Indian Institute of Technology), India (1983-'88). Dr. Shrestha has got working experiences of more than two decades. He had already served to the Department of Housing and Urban Development, Ministry of Housing and Physical Planning, Government of Nepal, United Nations Centre for Regional Development (UNCRD), Japan and various architectural schools in Nepal before taking the present job at Town Development Fund (TDF). He has initiated a new master program in Urban Design and Conservation at Khwopa Engineering College, Purbanchal University, where he served two years as Head of Post-graduate Department of Urban Design and Conservation.

Dr. Shrestha is the recipient of numerous gold medals for his excellent academic performance and decorated by 'Calcutta Convention National Award 2006' by Indian Society for Technical Education for his best paper at the 35th ISTE Annual convention and National Seminar on Disaster – Prediction, Prevention and Management. He is also member of numerous professional bodies and life member of various alumni associations. He has already contributed more than five dozen of papers, published in various forms: book chapter, international journals, conference proceedings, local magazines and journals including in local newspapers. Moreover, he has been invited in numerous international conferences for presentation of his research findings. Finally, his field of expertise includes sustainable urban development, disaster management, housing, local government capacity building and development control. He will focus on universal design concept on Nepal

September 2024 Vol-19 No-9



Steinar Valade-Amland.

He is market economist, and after more than 30 years of professional practice, I have accumulated extensive and valuable experience from a wide range of industries and managerial roles within marketing and sales, communication, PR and advocacy - leading to the design industry as an account director and later CEO of one of Denmark's leading brand design agencies, culminating in the role of spokesperson for the Danish design community, heading Danish Designers - parallel with holding numerous honorary positions.

My primary role today is helping organisations and management teams to establish the best possible baseline for business development and change processes - through stakeholder engagement and moderated processes, through organisational learning and co-creation. I'm rather agnostic when it comes to models and methods, but design thinking and processes inspired by design methodologies are part of my DNA after 30 years in and closely connected to the industry.

He authored numerous articles and book contributions, amongst others with 15 articles to the Bloomsbury Encyclopaedia of Design, out in 2015.

His latest book, DESIGN: A BUSINESS CASE - Thinking, Leading, and Managing by Design written together with Brigitte Borja de Mozota, is now out in English, Hindi and Korean.

New Books



Sunil Bhatia

Design for All. Volume-II

Drivers of Design



<https://www.morebooks.shop/shop-ui/shop/book-launch-offer/74414a1df61c3d2ea8bf46ae7e3c0cf31769f261>



Sunil Bhatia

Design for All

Drivers of Design

Expression of gratitude to unknown, unsung, unacknowledged, untrained and selfless millions of heroes who have contributed immensely in making our society worth living, their design of comb, kite, fireworks, glass, mirror even thread concept have revolutionized the thought process of human minds and prepared blueprint of future. Modern people may take for granted but its beyond imagination the hardships and how these innovative ideas could strike their minds. Discovery of fire was possible because of its presence in nature but management of fire through man made designs was a significant attempt of thinking beyond survival and no

doubt this contributed in establishing our supremacy over other living beings. Somewhere in journey of progress we lost the legacy of ancestors in shaping minds of future generations and completely ignored their philosophy and established a society that was beyond their imagination. I picked up such drivers that have contributed in our progress and continue guiding but we failed to recognize its role and functions. Even tears, confusion in designing products was marvelous attempt and design of ladder and many more helped in sustainable, inclusive growth.

www.lap-publishing.com

it is available on www.morebooks.de one of the largest online bookstores. Here's the link to it: <https://www.morebooks.de/store/gb/book/design-for-all/isbn/978-613-9-83306-1>

The Ultimate Resource for Aging in Place With Dignity and Grace!



Are you looking for housing options that are safer and more accommodating for independently aging in place? Do you want to enjoy comfort, accessibility, safety and peace of mind – despite your disabilities, limitations and health challenges? The help you need is available in the Universal Design Toolkit: Time-saving ideas, resources, solutions, and guidance for making homes accessible.

This is the ultimate resource for individuals and professionals who want to save time, money and energy when designing, building, remodeling or downsizing a home. The Universal Design Toolkit will help you take the steps to design homes for your clients or yourself while eliminating the costly trial and error challenges you'd inevitably encounter if faced with this learning curve on your own.

Rosemarie Rossetti, Ph.D., teamed with her husband Mark Leder in creating this unique Toolkit. They bring ten years of research, design and building expertise by serving as the general contractors for their home, the Universal Design Living Laboratory– which is the highest rated universal design home in North America.

Within the Toolkit's 200 richly illustrated pages, you'll find: Insights that distinguish *essential* products, services and resources from the *unnecessary*.

Proven, realistic tips for finding the right home.

Home features you need to look for. Nothing is assumed or left out.

Handy home checklists and assessments.

Interview questions to help you hire industry professionals with knowledge and experience. Photographs that provide a frame of reference to inspire, clarify and illuminate features and benefits.

Valuable resources to save you time, money and energy.

Helpful sources of funding.

Space planning dimensions for access using assistive devices such as wheelchairs and walkers.

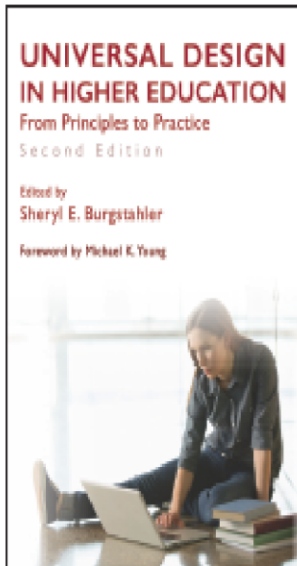
And so much more!

If you want useful, dependable advice and easy to implement ideas from respected experts who know the ropes, you'll love Rossetti and Leder's perspective. As a speaker, author and consultant who uses a wheelchair, Rossetti has helped hundreds of people design their ideal homes. Now her comprehensive Toolkit is available to help and support you! Get the Universal Design Toolkit now to start your project!

“Fresh, comprehensive, and engaging, *Universal Design in Higher Education* is expertly written, thoughtfully crafted, and a ‘must-add’ to your resource collection.”

—STEPHAN J. SMITH, EXECUTIVE DIRECTOR, ASSOCIATION ON HIGHER EDUCATION AND DISABILITY

**Harvard
Education
Press**



384 PAGES
978-1-602-50-096-0
SEPTEMBER 2015
\$34.00 PAPERBACK

UNIVERSAL DESIGN IN HIGHER EDUCATION

From Principles to Practice, Second Edition

EDITED BY SHERYL E. BURGSTAHLER • FOREWORD BY MICHAEL K. YOUNG

This second edition of the classic *Universal Design in Higher Education* is a comprehensive, up-to-the-minute guide for creating fully accessible college and university programs. The second edition has been thoroughly revised and expanded, and it addresses major recent changes in universities and colleges, the law, and technology.

As larger numbers of people with disabilities attend postsecondary educational institutions, there have been increased efforts to make the full array of classes, services, and programs accessible to all students. This revised edition provides both a full survey of those measures and practical guidance for schools as they work to turn the goal of universal accessibility into a reality. As such, it makes an indispensable contribution to the growing body of literature on special education and universal design. This book will be of particular value to university and college administrators, and to special education researchers, teachers, and activists.

SHERYL E. BURGSTAHLER is an affiliate professor in the College of Education at the University of Washington in Seattle, and founder and director of the university's Disabilities, Opportunities, Internetworking, and Technology (DO-IT) and Access Technology Centers.

SAVE 20% when you mention sales code **UDHE15**

(OFFER EXPIRES 1/8/2016)

“Sheryl Burgstahler has assembled a great set of chapters and authors on universal design in higher education. It’s a must-have book for all universities, as it covers universal design of instruction, physical spaces, student services, technology, and provides examples of best practices.”

—JONATHAN LAZAR, PROFESSOR OF COMPUTER AND INFORMATION SCIENCES, TOWSON UNIVERSITY, AND CO-AUTHOR OF *ENSURING DIGITAL ACCESSIBILITY THROUGH POLICY AND PRACTICE*

ORDER HERE

YOUR INFORMATION

NAME _____
 ADDRESS _____
 STATE _____ ZIP _____

BILLING

CARD # _____
 EXP. DATE _____
 INITIALES _____ SVC CODE _____

PLACE YOUR ORDER

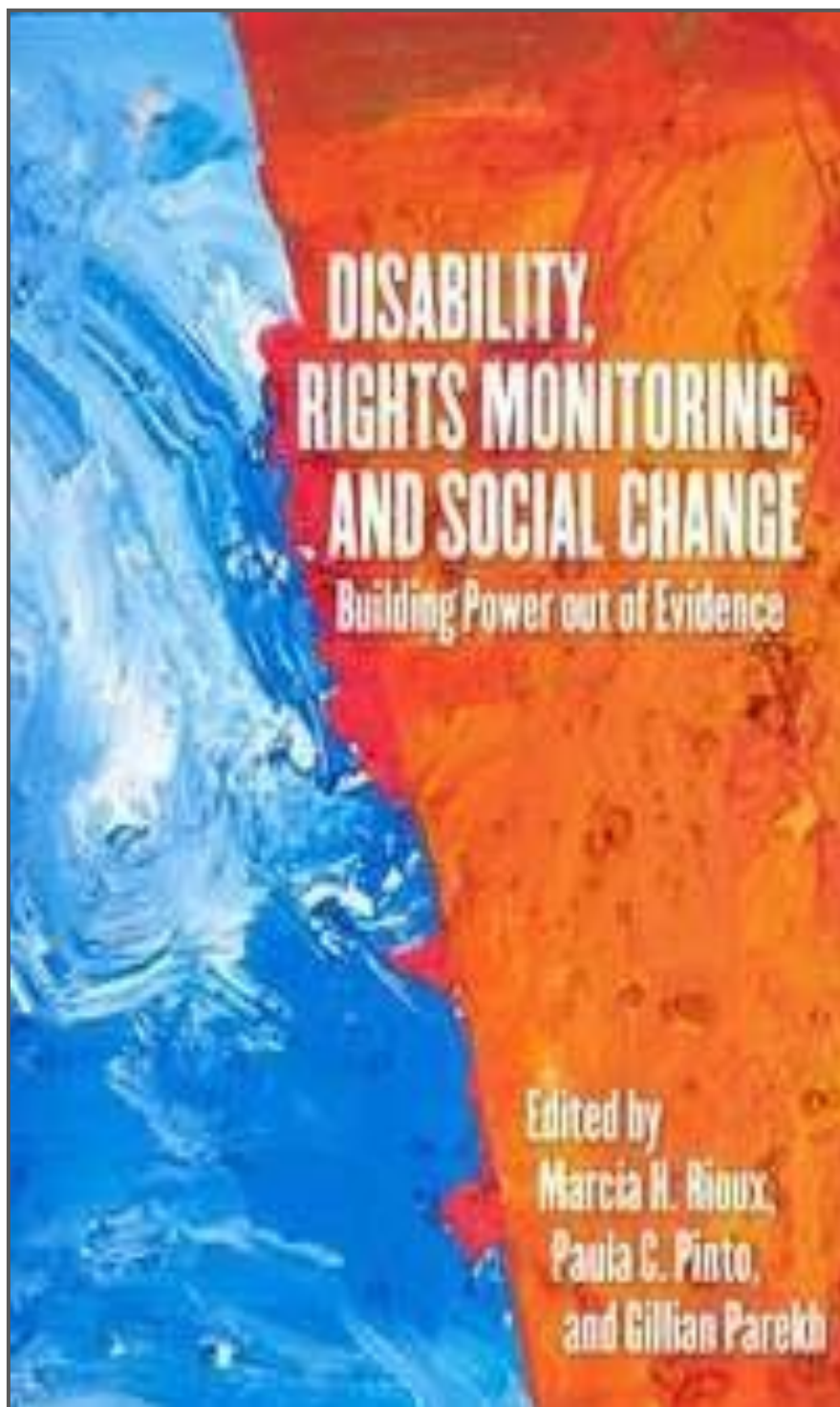
WEB
HARVARD.EDUCATIONPRESS.ORG
 PHONE
1.888.437.4637
1.878.829.2582 (OUTSIDE US)
 FAX
1.878.348.1233
 E-MAIL
ORDERS@HUP.EDU
 MAIL
HARVARD EDUCATION PRESS
C/O PSSC
46 DEVELOPMENT ROAD
ITCHINGBURG, MA 01420

ORDER DETAILS			
QTY	UNIT PRICE	PRICE	
	\$34.00	\$27.20	
SHIPPING		ONE COPY	EACH ADD'L
US	\$6.45	\$2.50	SUBTOTAL
CANADA	\$7.95	\$4.50	IMP/HANDL
OTHER	\$11.50	\$4.50	TOTAL

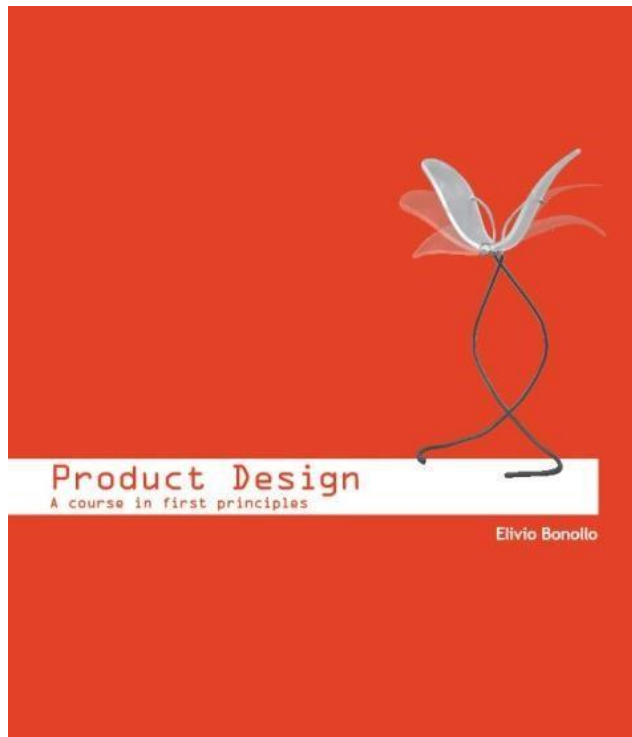
TELEPHONE _____ EMAIL _____
 MASTERCARD VISA AMERICAN EXPRESS

 BILL ME/TO NUMBER _____
 CHECK ENCLOSED, PAYABLE TO HARVARD EDUCATION PUBLISHING GROUP

Disability, Rights Monitoring and Social Change:



New Update: ELIVIO BONOLLO (2015/16) PRODUCT DESIGN: A COURSE IN FIRST PRINCIPLES



Available as a paperback (320 pages), in black and white and full colour versions (book reviewed in *Design and Technology Education: An International Journal* 17.3, and on amazon.com).

The 2018, eBook edition is available in mobi (Kindle) and ePub (iBook) file versions on the amazon and other worldwide networks; including on the following websites:

ePub version: www.booktopia.com.au

<https://www.booktopia.com.au/ebooks/product-design-elvio-bonollo/prod9781784562946.html> mobi (Kindle

versions): www.amazon.in

[https://www.amazon.in/Product-Design-Course-First-](https://www.amazon.in/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_1?ie=UTF8&qid=1532999395&sr=81&keywords=Product+Design%3A+A+course+in+first+principles)

[Principlesebook/dp/B07FNV2F4L/ref=sr_1_1?ie=UTF8&qid=1532999395&sr=81&keywords=Product+Design%3A+A+course+in+first+principles](https://www.amazon.in/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_1?ie=UTF8&qid=1532999395&sr=81&keywords=Product+Design%3A+A+course+in+first+principles) www.amazon.com

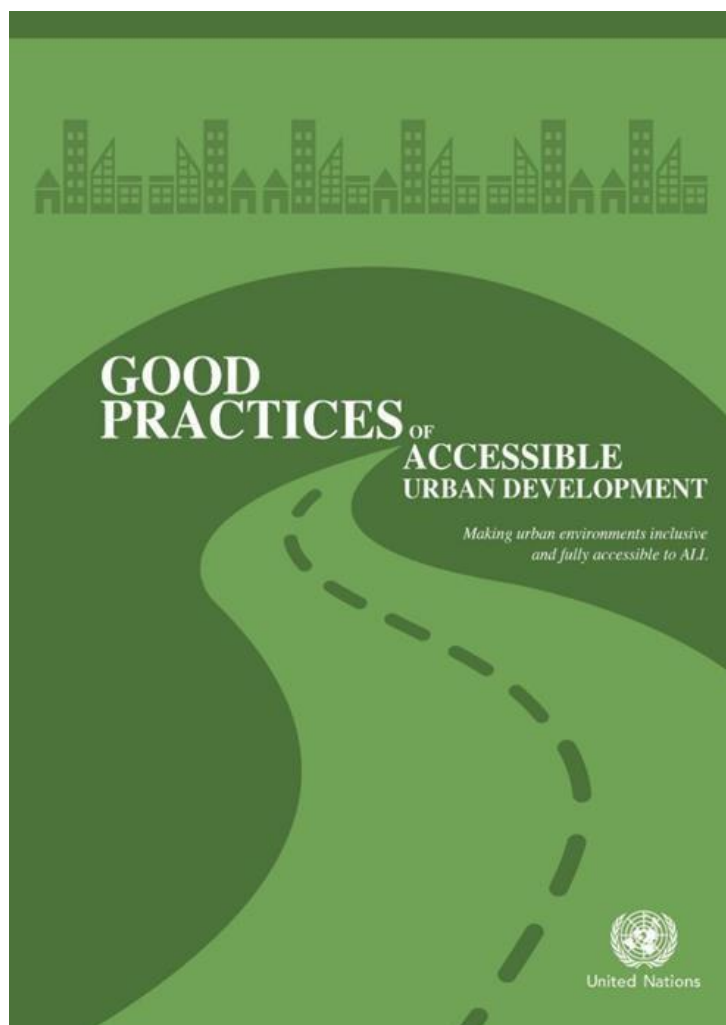
[http://www.amazon.com/Product-Design-course-firstprinciples/dp/1784562939/ref=sr_1_sc_1?ie=UTF8&qid=1456434322&sr=8-](http://www.amazon.com/Product-Design-course-firstprinciples/dp/1784562939/ref=sr_1_sc_1?ie=UTF8&qid=1456434322&sr=8-1spell&keywords=Bonollo+Product+Design%3A+A+course+in+first+principles)

[1spell&keywords=Bonollo+Product+Design%3A+A+course+in+first+principles](http://www.amazon.com.au/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-1fkmr0&keywords=Product+Design+a+course+in+first+principles) www.amazon.com.au

[https://www.amazon.com.au/Product-Design-Course-First-](https://www.amazon.com.au/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-1fkmr0&keywords=Product+Design+a+course+in+first+principles)

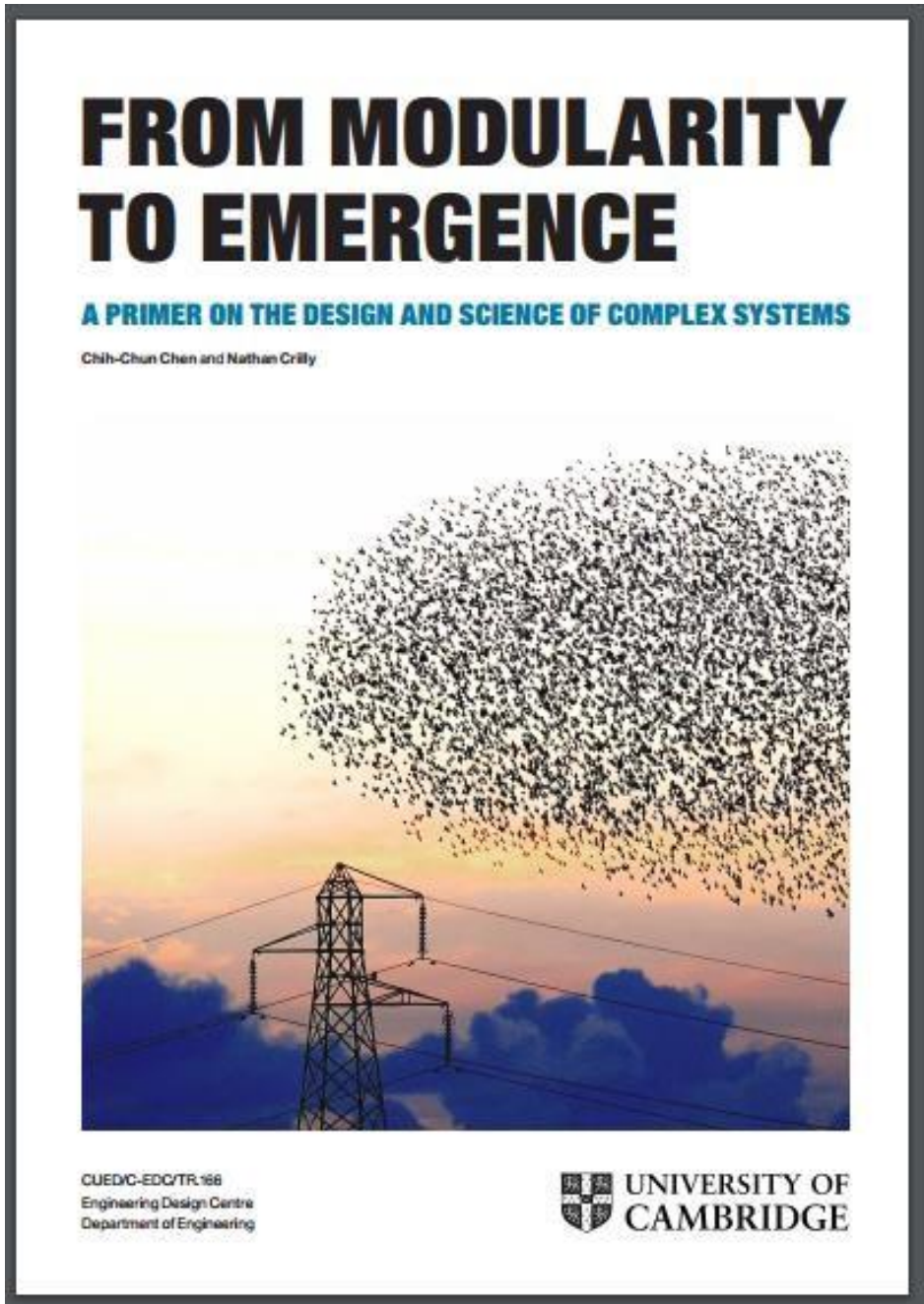
[Principlesebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-](https://www.amazon.com.au/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-1fkmr0&keywords=Product+Design+a+course+in+first+principles)

[1fkmr0&keywords=Product+Design+a+course+in+first+principles](https://www.amazon.com.au/Product-Design-Course-First-Principlesebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-1fkmr0&keywords=Product+Design+a+course+in+first+principles)



In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the Essl Foundation (Zero Project) and others have prepared a new publication entitled: "Good practices of accessible urban development".

The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services. The publication concludes with strategies and innovations for promoting accessible urban development. The advance unedited text is available at:http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf



Dr Chih-Chun Chen and Dr Nathan Crilly of the Cambridge University Engineering Design Centre Design Practice Group have released a free, downloadable book, A Primer on the Design and Science of Complex Systems.

This project is funded by the UK Engineering and Physical Sciences Research Council (EP/K008196/1).

The book is available at URL: <http://complexityprimer.eng.cam.ac.uk>

Changing Paradigms: Designing for a Sustainable Future

Editors:
Peter Stebbins
Ursula Tischner

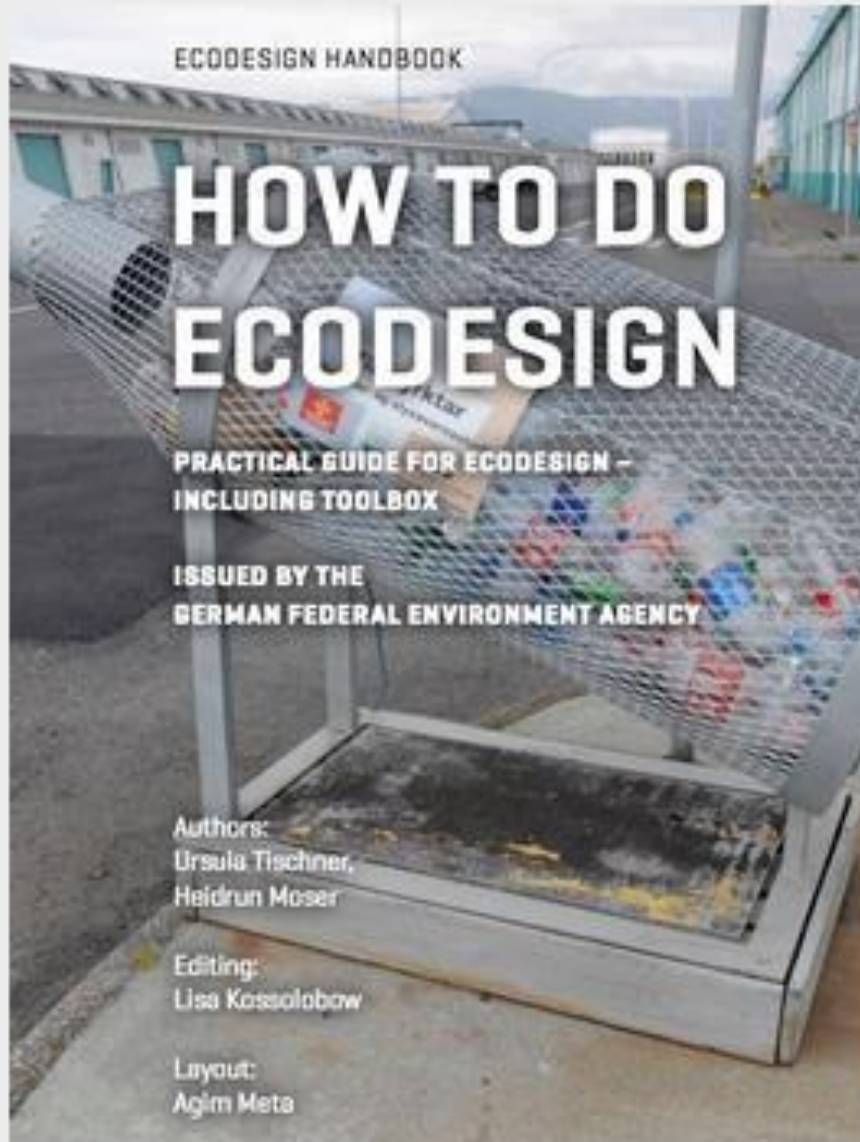
CUMULUS THINK TANK
Publication No 1 of the Think
Tank Series from the Cumulus
International Association of
Universities and Colleges of
Art, Design and Media

Cumulus
International Association of
Universities and Colleges of
Art, Design and Media

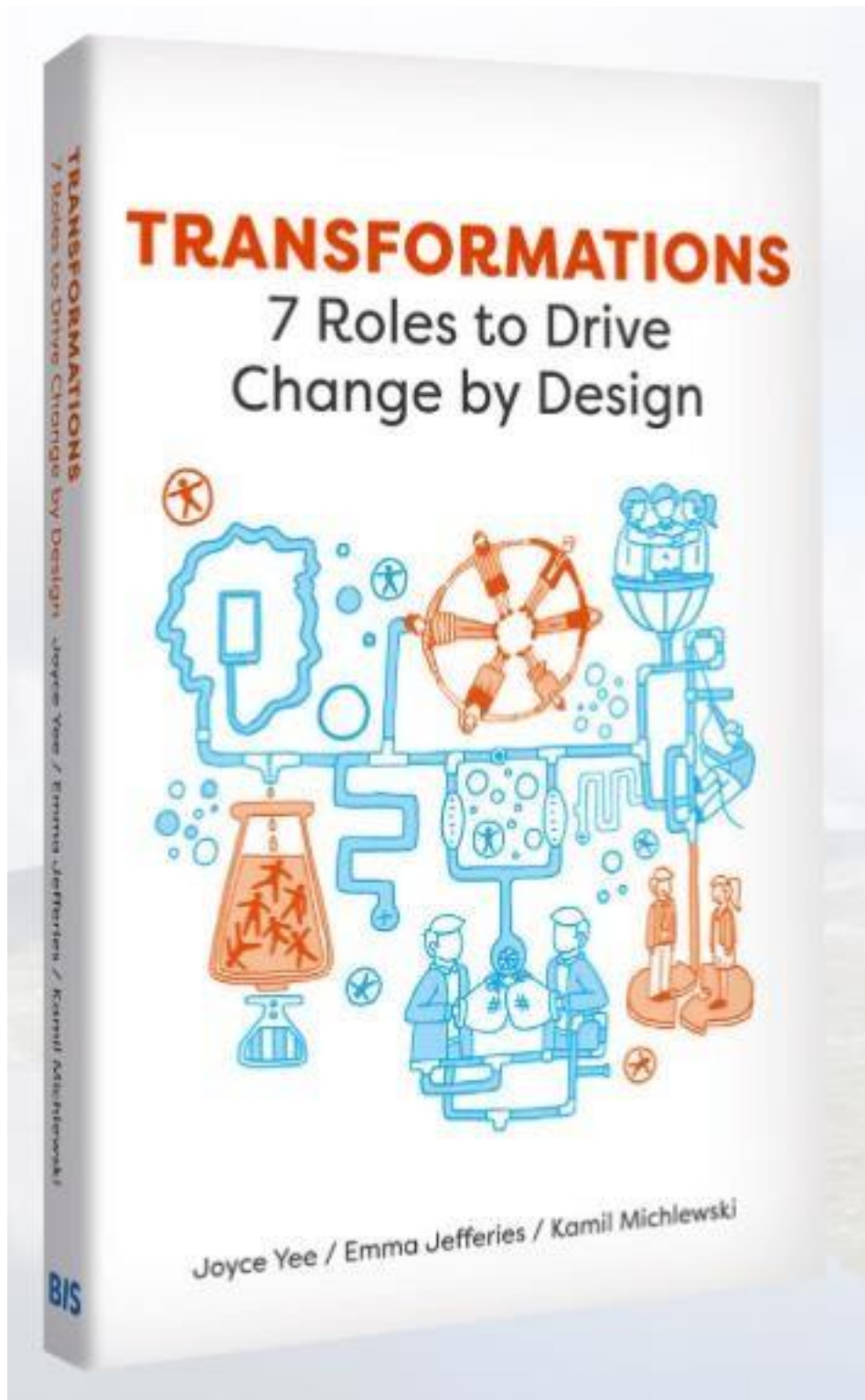


Changing
Paradigms:
Designing for a
Sustainable
Future

New iBook / ebook: HOW TO DO ECODESIGN



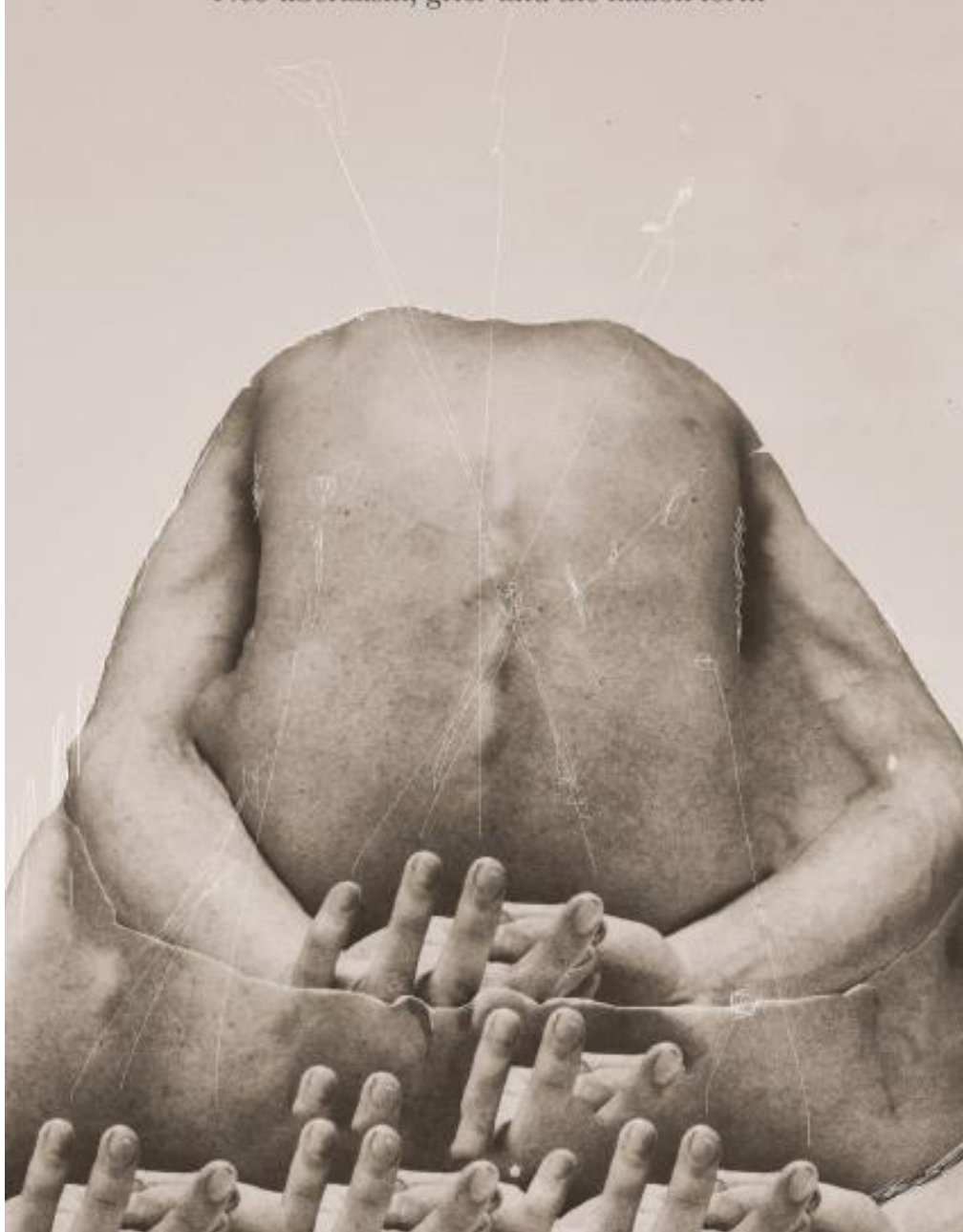
Practical Guide for Ecodesign – Including a
Toolbox
Author: Ursula Tischner

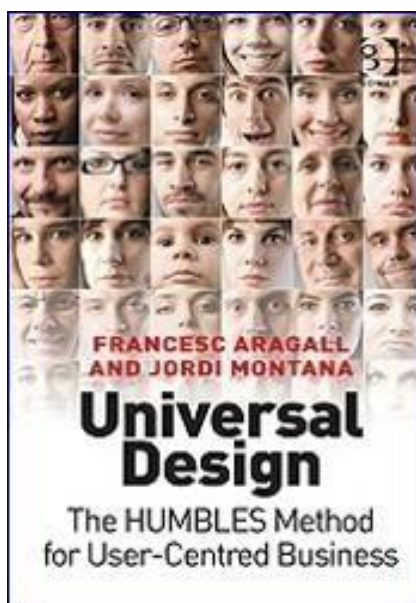


Amar Arnason and Sigurjón Baldur Hafsteinsson

DEATH AND GOVERNMENTALITY

Neo-liberalism, grief and the nation form



Universal Design: The HUMBLE Method for User-Centred Business

“Universal Design: The HUMBLE Method for User-Centred Business”, written by Francesc Aragall and Jordi Montaña and published by Gower, provides an innovative method to support businesses wishing to increase the number of satisfied users and clients and enhance their reputation by adapting their products and services to the diversity of their actual and potential customers, taking into account their needs, wishes and expectations.

The HUMBLE method (© Aragall) consists of a progressive, seven-phase approach for implementing Design for All within a business. By incorporating the user’s point of view, it enables companies to evaluate their business strategies in order to improve provide an improved, more customer-oriented experience, and there by gain a competitive advantage in the marketplace. As well as a comprehensive guide to the method, the book provides case studies of multinational business which have successfully incorporated Design for All into their working practices.

According to Sandro Rossell, President of FC Barcelona, who in company with other leading business professionals endorsed the publication, it is “required reading for those who wish to understand how universal design is the only way to connect a brand to the widest possible public, increasing client loyalty and enhancing company prestige”. To purchase the book, visit either the Design for All Foundation website

Nina Foundation's latest E Book has been Published on following online platforms. Now you have more options to download and read

Amazon's Kindle;

AMAZON INTERNATIONAL EDITION

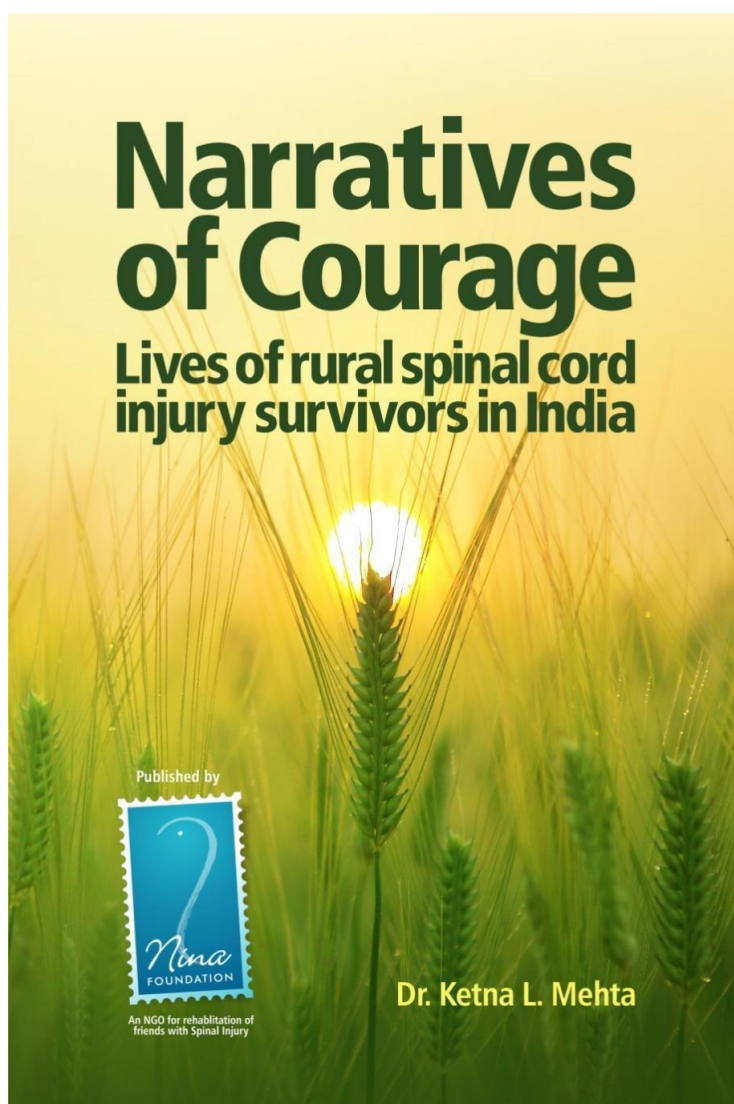
<https://www.amazon.com/dp/B09WR78DN7>

AMAZON INDIAN EDITION

<https://www.amazon.in/dp/B09WR78DN7>

Other online platforms with a choice to read on any device (mobile, laptop, tablet, PC etc):

Scribd, Hoopla, Barnes & Noble, Tolino, Vivlio, Borrow Box, Apple, Kobo, Baker & Taylor, Bibliotheca, OverDrive.




NOW AVAILABLE

Case Studies in Applied Behavior Analysis for Individuals with Disabilities *(Second Edition)*


Keith Storey, Ph.D., BCBA-D
Linda Haymes, Ph.D., BCBA-D

This book responds to a critical need for highly qualified personnel who will become exemplary professionals because of their advanced knowledge, skills, and experiences in working with students and adults that have varying disabilities, including Autism Spectrum Disorders (ASD). Since Board Certification for behavior analysts was introduced, there has been an expansion of training programs in Applied Behavior Analysis to meet the demands from school districts, health insurers, and families. In spite of these developments, a case studies book has not been available that uses the Behavior Analyst Certification Board Task List, Fifth Edition (BACB) guidelines for educating individuals receiving their BCBA, or for those in the field such as teachers, and service providers. The goal of this book is to fill that need. In this newly revised second edition, eighteen case studies are provided—case studies with complete analysis, case studies with partial analysis, and case studies without analysis. The format, readability, and detailed description of instructional methodology makes this text a valued resource for instructors and behavior analysts responsible for improving the skills of people with disabilities.



Charles C Thomas, Publishing
is proud to announce the
release of this second edition.

**For more information, or to order
your copy, scan the QR code below!**



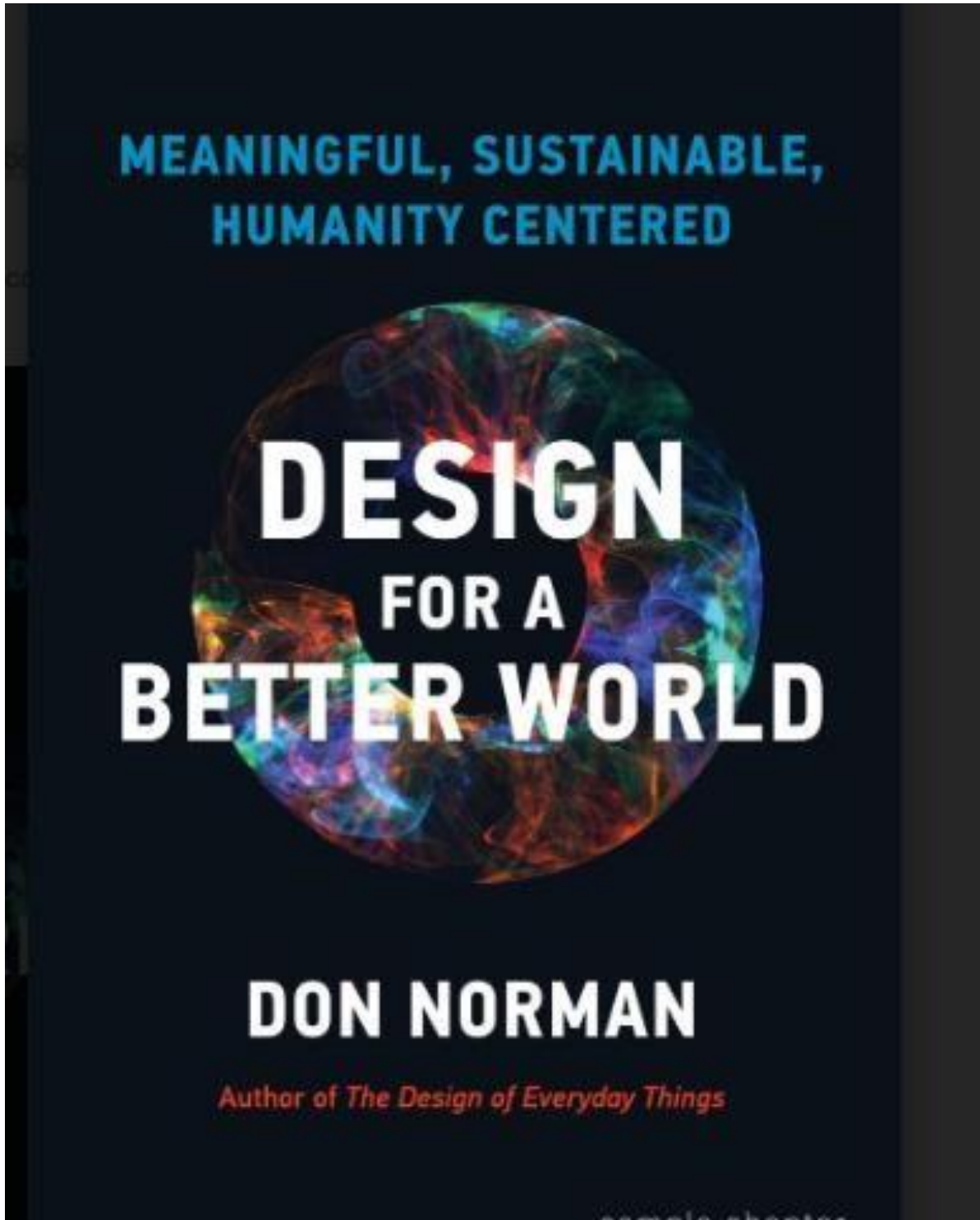
FOR MORE OF OUR PRODUCTS
www.CCThomas.com
(800) 521-0600
QR Code for Product Information

\$59.95 [paper] ISBN 978-0-398-09400-3
\$59.95 [eBook] ISBN 978-0-398-09401-0

Contents

<p>Preface</p> <p>Overview of Applied Behavior Analysis for Individuals with Disabilities</p> <p>Components of Applied Behavior Analysis</p> <p>Seven Basic Principles of Applied Behavior Analysis</p> <p>Applied Behavior Analysis and People with Disabilities</p> <p>Self-Determination, Self-Advocacy, and Person-Centered Planning</p> <p>Quality of Life</p> <p>Executive Skills</p> <p>Communication Skills</p> <p>Multiculturalism and Diversity Applications in Applied Behavior Analysis</p> <p>Behavioral Review of Case Studies</p> <p>Fifth Edition Task List</p> <p>Matrix of Case Studies by Age and Disability</p> <p>Technology in Text</p> <p>References</p>	<p>Case Study: Elena, World</p> <p>Case Study: Evelyn, Classroom</p> <p>SECTION THREE — Case Studies Without Analysis</p> <p>Case Study: Thurston, Farm</p> <p>Case Study: Beatrice, Estate</p> <p>Case Study: Elliott, Lawn</p> <p>Case Study: Stefano, Aspiration</p> <p>Case Study: Savannah, List</p> <p>Case Study: Elyse, Job</p> <p>Appendix: Resources Regarding Applied Behavior Analysis and People with Disabilities</p> <p>Index</p> <p>Subject Index</p>
--	--

Case Studies in Applied





News

1

10 Questions With Joseph Madaus About Higher Education and Disability

Joseph Madaus, professor of special education in the Department of Educational Psychology, co-edited the recently published "Handbook of Higher Education and Disability" through Edward Elgar Publishing. This 10 Questions feature covers his work and research in higher education accessibility for students with disabilities.



Joe Madaus

"The primary challenge disabled students experience when transitioning to college is the change from the structured environment of high school to the more independent college setting," Joseph Madaus says. (Neag School photo)

In our recurring 10 Questions series, the Neag School of Education catches up with students, alumni, faculty, and others throughout the year to offer a glimpse into their Neag School experience and their current career, research, or community activities.

Joseph Madaus, professor of special education in the Department of Educational Psychology, co-edited the recently published "Handbook of Higher Education and Disability" through Edward Elgar Publishing. In 2022, he also authored a case study, "Perceptions of Factors That Facilitate and Impede Learning Among Twice-Exceptional College Students With Autism Spectrum Disorder," published in Neurobiology of Learning and Memory.

As the director of the Collaborative on Postsecondary Education and Disability, Madaus also currently serves on the editorial board of nine journals, including the Journal of Postsecondary Education and Disability, TEACHING Exceptional Children, and Career Development and Transition for Exceptional Individuals, for which he was named reviewer of the year in 2008 and 2011.

In 2008, Madaus was named a University Teaching Fellow, the highest teaching honor at the University of Connecticut. He was the 2018 recipient of the Oliver P. Kolstoe Award for significant lifetime contributions to the field of transition from the Division on Career Development and Transition of the Council for Exceptional Children. He was also named the Neag School's Distinguished Researcher in 2019.

In addition to a Ph.D. in special education from the University of Connecticut, Madaus holds a master's degree in counseling psychology from Boston College, where he also received his

undergraduate degree in elementary education/moderate special education.

In this feature, we learn more about Madaus' new book and the importance of higher education accessibility for students with disabilities.

Q: Where did the inspiration for this book come from? How long was this in the works?

A: I was initially contacted by an editor from Edward Elgar Publishing in November 2020 to edit a research book on higher education and disability for the Elgar reference volume series. The publisher was seeking a book primarily targeted to an academic audience with a global mix of authors.

Q: How did you connect with the other author, Lyman Dukes?

A: Lyman and I have collaborated on research, writing, and presentation projects for nearly two decades. Lyman is a graduate of the Neag School's Ph.D. program in special education with a focus on higher education and disability under the advisement of Stan Shaw and Joan McGuire. We connected while he was completing his dissertation and reconnected when we worked on a book called "Preparing Students with Disabilities for College: A Practical Guide for Transition Planning" with Stan. We have also co-edited a few special topical issues of journals. Given Lyman's knowledge of the field, his outstanding editorial skills, and our long-standing work together, I made sure that he could be a co-editor before I agreed to take on the research handbook.

Q: How did you conduct the research and collect data for this book?

A: Lyman and I developed a broad outline of topics that we thought would be important in the handbook, including broad descriptions of current practices in serving disabled students; emerging and promising practices and populations of students; student self-determination; attempts to frame services through social justice perspectives; and the impact of assistive technologies and universal design techniques to enhance access. Lyman and I recently worked on – along with Neag School faculty member Nicholas Gelbar and former Neag School faculty member Michael Faggella-Luby – a systematic review of professional literature in higher education and disability published between the early 1950s and 2012. So, one of our first steps was to identify articles by international authors and to reach out to invite them to participate. We also used a “snowball” approach where we asked colleagues to nominate researchers from other countries and sought to identify authors from around the globe. The authors were allowed to choose one of the broad themes and were invited to identify co-authors as they saw fit. The handbook has 29 chapters with 68 authors representing 10 countries.

Q: How does this book compare to other research works and projects you have been involved in?

A: Most of the other research and book projects were based entirely in the United States and, in some cases, with colleagues from Canada. Laws, perspectives about disability, the terminology used, and higher education systems vary tremendously from nation to nation. And importantly, perspectives related to disability and, in turn, related to service delivery are continually evolving. Learning about these differences across the globe and about evolving philosophies related to disability across cultures and nations was fascinating.

Disabled students bring an enormous range of talent and diversity to higher education, and access to higher education results in a more diverse and skilled workforce. – Joseph Madaus

Q: What is the importance of providing resources for students with disabilities? What is the broader impact?

A: Disabled students bring an enormous range of talent and diversity to higher education, and access to higher education results in a more diverse and skilled workforce. It also results in a more diverse and inclusive college community, which can enhance the educational experience of all students on campus. Providing high-quality support and instruction is key to improving these talented students' physical and instructional access. The resources provided to students with disabilities – extended testing time, note-taking supports, or others – can improve academic success and empower students to perform their best work. The use of universal design concepts in instructional delivery that are helpful for disabled students can improve the experiences of a broad range of students.

Q: What do you hope educators take away from this book? What is its purpose?

A: Our primary goal was to allow researchers from a range of institutions across the globe to highlight what they believe are cutting-edge and best practices related to providing services to disabled students in higher education. We believe that researchers and practitioners can apply these international lessons to policies and practices in their local settings. We also clearly recognize that 29 chapters from 10 countries only scratch the surface of global practices in promoting access to higher education for disabled students, and hope that this is only a starting point for future

discussions and publications about international approaches to higher education and disability.

Q: How did receiving your Ph.D. in special education from the Neag School prepare you for conducting and synthesizing the research for this book?

A: Lyman and I were fortunate to have the opportunity to be advised by two pioneering leaders in the field of higher education and disability, faculty members Stan Shaw and Joan McGuire. Additionally, we took courses with other well-regarded faculty such as Scott Brown and Robert Gable. We conducted research, published in peer-reviewed journals, and presented at national and international conferences during our doctoral studies at the Neag School. Following graduation, both Stan and Joan continued to work alongside us as we began our respective careers as faculty members in higher education. About 15 years ago, Stan asked us to co-edit a book focused on the shift from school to college for adolescents with disabilities titled "Preparing Students with Disabilities for College Success: A Practical Guide to Transition Planning." It was our first book publication and provided the two of us with the experience necessary to lead the book development process in the future.

Q: What is the biggest challenge for special education students seeking a college education? How can disability services help lessen this burden?

A: The primary challenge disabled students experience when transitioning to college is the change from the structured environment of high school to the more independent college setting. There are fewer easily accessible individualized supports, increased academic demands, social-emotional adjustments, and – perhaps the most important change – the need to advocate for

oneself. Disability services can discuss with newly enrolled students how to utilize their services, and other university supports available to all students to navigate the transition to college to the best of the student's ability.

Q: Did the pandemic and the emergence of digital learning enable you to further explore different learning styles and effective teaching methods for students with learning disabilities?

A: The impact of the recent pandemic is a topic we have examined in some depth over the past few years. We have found that COVID-19 likely served as a catalyst for increased use of instructional practices known as universal design. Universal design is a framework for teaching and learning that promotes the design and delivery of inclusive practices to reduce potential barriers to learning. While the pandemic had several negative impacts on students with disabilities, the increased use of universal design approaches to instruction stands out as one important benefit.

To learn more about higher education accessibility for students with disabilities, Joseph Madaus' research, or the Collaborative on Postsecondary Education and Disability, email him at joseph.madaus@uconn.edu.

(Courtesy: UCONN UNIVERSITY OF CONNECTICUT)



Programme and Events



SANT 2024

The annual Conference of the Swedish Anthropological Association (SANT), will take place at Uppsala University, April 24-26

Call for Entries to the ASLA 2024 Professional Awards Program Now Open



ASLA 2023 Student Collaboration Award of Excellence. On the Edge: A Climate Adaptive Park for the Battleship NC Memorial. Wilmington, North Carolina. Marguerite Kroening, Student ASLA; Stella Wang, Student ASLA; Faculty Advisors: Andrew Fox, FASLA; David Hill. North Carolina State University / Marguerite Kroening

ASLA is now accepting submissions for its [2024 Student Award Program](#).

Registration deadline: Friday, May 3, 2024

Submission deadline: Friday, May 24, 2024

AgriVoltaics 2024

Student Design Competition

THE WORLD CONFERENCE
AgriVoltaics
June 11-13 Denver, CO, USA

POWERED BY
HeroX

Design for the 5 C's of Agrivoltaic Success

- Climate
- Configuration
- Crops and Cultivation
- Compatibility
- Collaboration

URBAN

Denver County, Colorado
5 Acres / 2 Hectares

PERI-URBAN

Mesa County, Colorado
20 Acres / 8 Hectares

RURAL

Weld County, Colorado
500 Acres / 200 Hectares

All participants must indicate their intent to submit a final project by "Following the Competition" via HeroX Platform by March 29, 2024.



2024

Design Can Save the World!

'Seoul Design Reporter 2024' project is launching its Call for application to make Seoul more sustainable and more livable.
Closing date is 11th April 16:00 KST.



SEOUL
DESIGN
REPORTER



Application period
: 28th Feb 2024 (9:00 KST) ~ 11th April 2024 (16:00 KST)

Open Call for Seoul Design Reporter 2024

Who can apply?

- ① Currently living or working abroad
- ② People who are interested in design, design major students (including graduates), designers

Number of reporters 2024 | 20

Key responsibilities

- ① Research on foreign design policies and write a report
- ② Make a video of case studies
- ③ Promote Seoul's design activities

Advantages

- ① We will offer 1,772,430 won (including tax)
- ② We also offer Letter of appointment, Business card, Certificate
- ③ Opportunity to be a co-author of 'Seoul Design Reporter 2024'

How to apply

We accept applications received at the email address: better1119@seoulde-sign.or.kr until 11th April (16:00 KST).

Please refer to the information on our website (<https://seoulde-sign.or.kr/>) for details on how to apply





We welcome submissions from both researches and practitioners for the 7th International Conference on Universal Design, UD2024. Log on to EasyChair and send us a 500 word abstract on your project before April 7th. We look forward to reading your submissions.



Job Openings



Contact *Design for All Institute of India*

Advertising:

To advertise in digital Newsletter

advertisement@designforall.in

Acceptance of advertisement does not mean our endorsement of the products or services by the Design for All Institute of India News and Views:

Regarding new products or events or seminars/conferences/ workshops.

News@designforall.in

Feedback: Readers are requested to express their views about our newsletter to the Editor

Feedback@designforall.in



Forthcoming Events and Programs:

Editor@designforall.in

The views expressed in the signed articles do not necessarily reflect the official views of the Design for All Institute of India.

Chief-Editor:



**Dr.Sunil Kumar Bhatia Faculty Member,
13, Lodhi Institutional Area, Lodhi Road, New Delhi-
110003(INDIA)
E-mail:dr_subha@yahoo.com**

Editor:



**Shri L.K. Das
Former Head Industrial Design Center, Indian Institute
of
Technology (Delhi),
India E-mail:
lalitdas@gmail.com**

Associate Editor:



**Prof Dr RachnaKhare, School of planning and
Architecture , Bhopal,
India**

**E-mail:
rachnakhare@spabhopal.ac.in**

Editorial Board:



**Prof Dr.GauravRaheja, Indian Institute of Technology,
Roorkee,
India Email: gr.iitroorkee@gmail.com**



**Prof Dr. Sugandh Malhotra, Indian Institute of
Technolgy, Mumbai, India
Email: sugandh@iitb.ac.in**



**Prof Dr Ravindra Singh, Delhi Technological University,
India
Email: ravindra@dtu.ac.in**

Special Correspondent:

**Ms. Nemisha Sharma,
Mumbai, India**

Nemisha98@gmail.com

Address for Correspondence:

**13, Lodhi Institutional Area,
Lodhi Road, New Delhi-110 003India.**

**Material appearing in this journal may be freely
reproduced. A copy of the same and acknowledgement
would be appreciated.**

**This journal is published monthly for free for benefits
for readers, by Design for All Institute of India,/ 70
Sector-18 Rohini, Delhi110089 (INDIA) and publisher
name Dr. Sunil Kumar Bhatia, address A/2/70 Sector-18
Rohini, Delhi-110089 Tel: +91-11-
27853470 ,E-Mail: dr_subha@yahoo.com**

**This publication is completely free .We do not charge
anything for published items in this journal from
contributors .**

Disclaimer:

***While every effort is made to check the accuracy of the
contributions published in Design for All, the publisher
do not accept responsibility for the view expressed***

which, although made in good faith, are those of the authors alone

Web site: www.designforall.in

Special request should be addressed to

Dr_subha@yahoo.com

ISSN: 2582-8304