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McDonagh, D. and Thomas, J.

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# Rethinking Design Thinking: Empathy Supporting Innovation

Deana McDonagh and Joyce Thomas

School of Art + Design, University of Illinois at Urbana-Champaign, Illinois, USA

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## RESEARCH

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### Corresponding Author:

Deana McDonagh  
Associate Professor of Industrial Design  
School of Art + Design  
408 East Peabody Drive  
University of Illinois (Urbana-Champaign)  
mcdonagh@illinois.edu

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## Abstract

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### Background

The material landscape we construct within our personal lives and inherit in public environments has significant impact upon our daily experiences. They affect our productivity, our feeling of wellbeing, and sense of being socially connected. Products that provide a positive user-experience can empower people and contribute to a healthful environment. Products that do not meet the product user's functional or emotional needs can cause a person's sense of independence to be eroded.

### Method

The authors have developed an empathic design research strategy that builds on the capitals (e.g., background, physical abilities, and education) of the individual and the designer, to ensure that more intuitive design outcomes are generated which meet *real* needs, rather than assumed needs. Acknowledging that all people have an empathic horizon (a boundary to their knowledge, experience, and awareness), further learning can take place by the designer in direct consultation and collaboration with the users.

### Results

Well-designed products that are intuitive to use contribute to a person's quality of life and independence. The possessions surrounding us can generate a sense of balance, harmony, and wellbeing. The number of possessions we own is not critical, but their usefulness and meaning to us is. As we age and develop disabilities, being able to live independently lives becomes increasingly important.

### Conclusion

Designers are developing ways in which to bridge the divide that exists between lived experiences, user needs, and existing products that fail to satisfy the user.

### Key Words

empathy, material landscape, designing process

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### Background

The products which people surround themselves with have significant impact on how they experience activities of their daily living. We engage with our material landscape on both rational and emotional levels<sup>1</sup>. This helps us to communicate and construct who we are<sup>2</sup>. Products that provide a positive user experience can empower people and contribute to a healthful environment. Products that do not meet the user's functional or emotional needs can cause their sense of independence to be eroded. As the worldwide demographics are shifting towards an older population who are likely to begin to experience disabilities, these design issues become increasingly critical.

### Empathy

This research relies upon the belief that a deeper understanding of users' needs is critical for a designer to respond with more effective product outcomes. By employing empathic modelling strategies, designers can gain insight and shared understanding with their target users.

Design thinking and understanding needs to be flexible as the user's situation and cultural cues evolve and are shaped by the material and historical dimensions of their lives. Designers, in turn, must expand and push beyond their own empathic horizon to include life-expert-users. This can take the designer outside his or her own personal comfort zone.

### Material Landscape

Material landscape is a dynamic concept that considers the changing requirements and roles that people need for their personal and public environments. We fill our homes with products that represent our achievements (e.g. trophies, certificates), cultural affiliations (e.g. football memorabilia, music CDs or film DVD collections), and status objects (e.g. expensive cars, perfume bottles) that provide insight into the selected lifestyle aspirations<sup>3</sup>. In addition, how we display these objects (e.g. highlight, cluster) and even hide stigma objects (e.g. dandruff shampoo, condoms, acne cream) provides valuable life experience indicators into an individual's daily life.

*"Never have more of us had more possessions than we do now, even as we make less and less use of them. The*



*homes in which we spend so little time are filled with things.”<sup>4</sup>*

Personal environments offer us a flexible place to be social, reclusive, quiet, or studious. We design the mood of our environments through product/object placement, lighting, scented candles, decoration, comfortable furniture and similar home comforts. The products and our environments have a significant impact on how we communicate and present ourselves to the outside world (others) and help to support us with positive affirmations (e.g. photographs of loved ones, mementoes of experiences).

**Product abandonment**

When a gulf exists between the user and the product or environment, significant psychological barriers can develop which become increasingly difficult to remove. Products that present difficulty can strip us of our dignity (e.g. opening basic food packaging or medicine containers, or even struggling with remote controls). This reaction can lead to a diminishing food choice, thus eroding some of the key active ingredients of people’s nutritional and sensorial experiences. This can result in product abandonment, avoidance, and/or misuse - and can be especially true for people with disabilities. For example, it is common for patients recovering from intrusive hip replacement surgery to undergo extensive physiotherapy and pain management, and yet they fail to use a walking cane or walker. Product stigma can repel the user from utilising valuable assistive technologies; this is not because they are not functional and helpful, but because the product does not resonate with the user. If a product carries a stigma, it can lead to product abandonment.

There are many examples in our personal and public environments where we navigate, accommodate, and adapt our behaviour to overcome such disconnections. For example, engaging with a door, which visually indicates that it should be pulled towards the user to open, when in fact it needs to be pushed, can generate significant embarrassment to an individual. Rarely does the individual acknowledge the design failure, but rather blames themselves for “getting it wrong.” In reality, the product (door) failed them.

*...“hidden geographies” of small but deceptively important things such as the size of print, the positioning of furniture, the location of the toilets, the juxtaposition of offices, doorways, and so on.”<sup>5</sup>*

Figure 1 illustrates that compliance with legal requirements under the Americans with Disabilities Act<sup>6</sup> does not always respond to the lived experience. This public space offers signage for those with vision, but fails to accommodate those with visual impairments. The man in Figure 1a-1c is

blind and 5 ft. 2 in. tall. He must climb on top a piece of furniture in order to read the Braille on the sign (Figure 1b).



Figure 1 (a) (b) and (c): Signage, which incorporates Braille, but does not take into account accessibility resulting in problems for the intended user

In Figure 1c, the individual demonstrates how he must stretch to reach even the bottom of the sign when standing on the floor after the furniture has been moved out of the way. Though this example may appear to be rather extreme, as soon as we become more sensitive and conscious of our environments, we begin to identify such product failures in our daily interactions. As people age and develop various disabilities, navigating less-than-accommodating environments can result in individuals becoming marginalised, isolated, excluded and literally impaired by products and environments. As designers, we try to generate products, environments, and services that will support the user for many years, and this attention to detail does not necessarily mean the products’ retail costs would increase.

**Supra-Functionality**

Designers have many challenges to ensure that product design outcomes are relevant and appropriate for users whose needs, expectations, and desires can be very dynamic. Products that are simply functional and do not create an enjoyable experience will normally not satisfy a user. When a purchaser considers products whose price points and functional needs are similar, the design, style, colours, and physical sensations are frequently the deciding factor that makes them choose one product over another. These more ephemeral needs of users, which go beyond the utilitarian functionality of the product itself, are referred to as supra-functionality.<sup>7</sup> Elements that contribute to an enjoyable experience are often rooted in our social, emotional, and cultural desires. Purchase decision-making, user-product bonding, and brand loyalty are impacted by this experience. These often difficult-to-grasp elements of supra-functionality<sup>7</sup> can be the final deciding factor for which product is finally chosen. In order to meet these needs, designers must actively develop research methodologies that are specifically aimed at collecting design-relevant data.

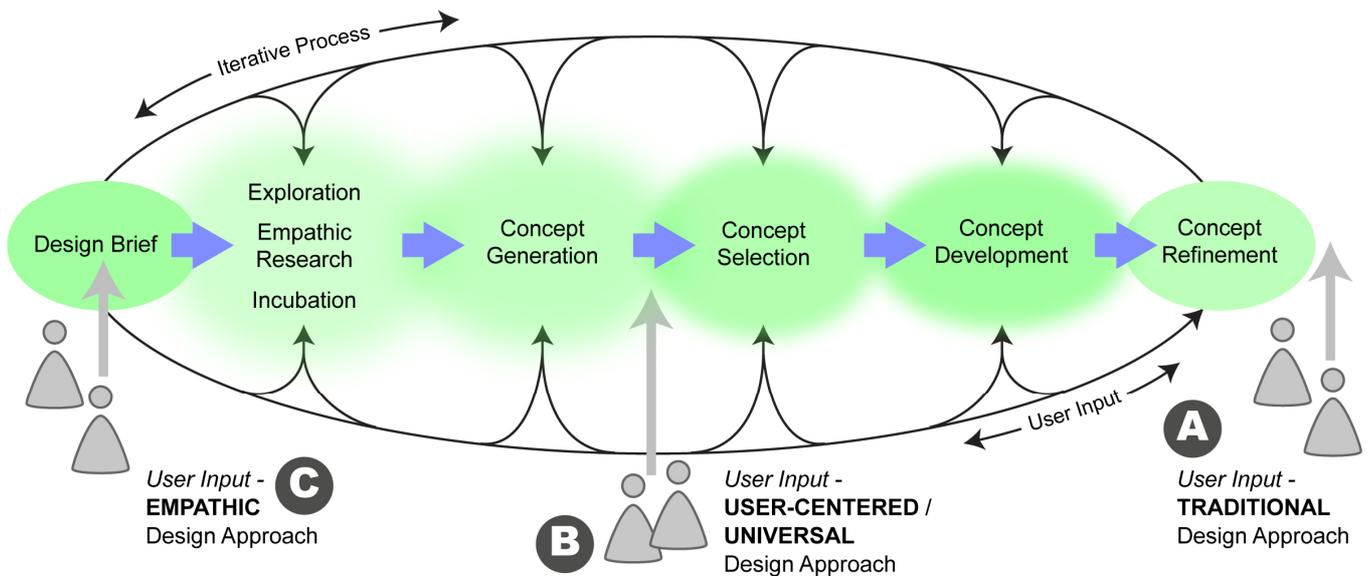


Figure 2: The Designing Process based on Empathic Design Research

### Method

A shift in design thinking is required to consider the “normality of doing things differently”<sup>5</sup>. Rather than aiming to design products for the persona of the ideal user, this focus utilises Empathic Design Research Strategies to reveal and discover product opportunities for real people. As designers use empathy to support their research, “design moments” emerge which provide them with more design-relevant data and supports product innovation.

Design thinking is changing. Figure 2 illustrates various approaches to user involvement within the designing process, (a) historically products were designed for the user, (b) then designers began to utilise user input, and (c) finally designers are actively involving users.

Discussion of the designing process is significant because for the first time in product development history, the target life-expert-user is being consulted whilst also becoming personally active within the development process (e.g. Freitag bags, Puma’s Mongolian Barbeque shoes).

Empathic design strategies utilise the most appropriate research methods available to the designers. Methods may include using passive ethnographic-type observations, through which designers can gain insight about the life-expert-user’s interaction with their material landscape - watching, listening, and absorbing without interfering in the user’s actions. Informal conversations provide the basis for developing trust between the designer and life-expert-user. Another approach may include collaboration that tends to rely on natural respect, patience, tolerance and a shared goal. Empathic modelling places the designer actively into the life-expert-user role and provides a supporting process to achieve a more thorough understanding of their experience. The designer temporarily views the world through life-expert-user’s eyes, from his or her physical viewpoint, to become aware of frustrations and challenges

in dealing with their material landscape. Other methods, which may be useful for designers include focus groups, shadowing, and role-playing.

In this approach, the designer and user engage as collaborators, and together develop knowledge and understanding in order to generate appropriate solutions for real needs. Life-expert-users who often have very different personal capital (e.g., background, physical abilities, and education) than the designer are embraced as co-creators to inform the designing process. Empathic design research relies on the user being an active and participatory partner within the information creation and designing process.<sup>8, 9, 10, 11</sup>

*“... listening to the voices of difference.”<sup>11</sup>*

### Empathic Horizon

*“In order to develop empathy with users, it is clear that designers need to be able to engage, listen, and understand the outlook of other people, which means involving actual people in the design process.”<sup>12</sup>*

Empathy deepens designers’ understanding of people whose background, education, and culture may be very different from their own. Gaining insight into a user’s emotions, aspirations, and fears can provide the designer with critical cues and inspiration to create more balanced functional and supra-functional products. Employing an empathic design research strategy enables the designer to expand his/her empathic horizon.<sup>7, 9, 13</sup>

Fulton Suri<sup>14</sup> advocates that empathy “is simply about achieving greater awareness, an extended imagination, and sensitivity to another person’s world in a powerfully memorable way.” Plowman<sup>15</sup> wrote that empathy is “the altered subjectivity that can come from immersion into a particular context,” a view that is helpful for designers



learning about human communication during the design process. According to Hoffman, empathy is “[the] effective response more appropriate to someone else’s situation than one’s own”.<sup>16</sup> Hickman discussed empathy with regard to the creative process: “I believe that one feature of creative behaviour is the ability to empathize. Asking people to put themselves into the place of another person . . . can facilitate ‘empathic understanding’: a way of knowing intuitively about people and things outside of our own personal world.”<sup>17</sup>

### Integrating Users in the Design Process



Figure 3: Designers and users blend together as a team of co-designers.

The authors have developed an ongoing course at a North American university, which involves students with and without disabilities designing together as a single group/community. Since 2007, Industrial Design students (engaged in Masters and Bachelors of Fine Arts degree programmes) have been partnered with students with various physical and sensory disabilities that are studying diverse subjects outside design (refer to Figure 3). This course is conducted under the guidelines of the university’s Institutional Review Board (IRB) and has included students with a variety of disabilities, including: amputation, cerebral palsy, dystonia, muscular atrophy, muscular dystrophy, retinitis pigmentosa, multiple sclerosis, spinal scoliosis, and transverse myelitis.



Figure 4. Ethnographic shadowing: a student with disabilities eating in public with a Personal Assistant helping him, and a student baking a cake in her apartment.

The students are taught empathic research strategies that consider user-needs to support wellness and wellbeing and the creation of more empowering products and spaces. In the process of developing empathy, awareness and understanding, all the students carry out empathic design

research activities to help support their personal insights into living with a disability (Figures 4 and 5). They observe daily living from the perspective of individuals with different life experiences - listening to what people tell about their experiences and watching how they behave in relation to things/environment.<sup>14</sup>



Figure 5. It takes an Industrial Design student (without any physical disabilities) a short period of time to appreciate how it feels to eat in a public restaurant when you cannot feed yourself and you rely on another person to assist you. Even though the student was with friends, she reported that she was overwhelmed by the reaction from other diners (e.g. staring, negative expressions).

Empathic modelling activities include very brief artificial experiences such as using a wheelchair, restricting mobility in the limbs, and restricting vision. Though this offers the students only a relatively superficial level of understanding into another’s abilities, it is still a powerful method to alert designers to how the most basic of activities can be challenging for individuals. Simulation is an important technique that may facilitate building empathy; however, empathy is about relationship. To build understanding and collaboration, student design teams are encouraged to talk to each other and learn about each other’s lives, dreams, goals, and aspirations. Ideally, the person without a disability will be as self-revealing as the person with a disability, making it a two-way street between designer and life-expert rather than the usual one-way. This helps to develop trust and deeper communication between designer and life-expert-user, breaking the boundaries generated by physical differences. Unlike the traditional scientific



research relationship of researcher/subject, more equal partnerships of designer/life-expert develop.

Utilising these empathic research strategies, design students have developed simple, insightful personal or assistive products that were intended to improve the quality of life (QOL) for students with disabilities. The goal was to create products that did not carry stigma and would visually integrate into the individual's lifestyle and personal environment.

### Results

The resulting product development was driven predominantly by design moments discovered during engagement between the pairs of designer and counterpart. Some of the innovative products that have been conceptualised have included a standing device to help a person with paraplegia engage in golf as a leisure activity, an electronic "direction finder" used in public buildings for visually impaired people, and a headset for a student with Cerebral Palsy that uses puffs of breath to dial a mobile telephone.

The findings of this student project show that collaboration between designers and life-user-experts allows development of a different kind of design-specific capital. For instance, the group developed a shared working language that is an example of the redefinition of values, beliefs, actions, and processes. Conversations heard during the designing process made it apparent that the students were not only gaining an understanding of a different worldview, but they were also beginning to demonstrate an intimacy that moves towards empathising with the challenges inherent to certain kinds of disabilities. The students became more mindful of their designing process, including the people-centred focus on users, which relates to Inclusive Design (ID). Whilst similar these approaches are distinctly different. ID requires user involvement in the process while we employ an approach that requires the designer to develop empathy with the user so that they design as if they were the user. In addition, after the students participated in this course they exhibited a greater desire and ease in engaging with real users.

Individuals are impaired by products and environments. It is only when one is faced with unnecessary challenges does one feels less able.

*"The built environment directly affects how people feel and behave."*<sup>18</sup>

In professional practice, empathic design research is increasingly playing a role in the development of successful products. Dan Formosa is one of the founders of SMART Design in New York and participated in the development of the OXO Good Grips range of products. He views design being less about generating products and more about creating positive experiences for the user. His designs offer the mainstream market place good examples of more

intuitive assistive products without the usual visual stigmas. The OXO products (Figure 6) were developed specifically for users with arthritis whilst being adopted enthusiastically by people of all levels of ability. Reducing stigma reduces the risk of product abandonment.



Figure 6: OXO Good Grips

A compelling case study involves a woman taking her husband's medicine by mistake due to poor visibility and legibility of information on the container. Clearly, taking the wrong medicine can have dire consequences. Deborah Adler developed (Figure 7) a wedge-shape form which provides more space for critical information, is both easier to read and open, and introduces a colour coding system so that individuals in multiple-person homes can readily identify their own medication. It is now used widely throughout the Target Store pharmacy service within the United States.



Figure 7: (a) Typical medicine bottle and (b) Adler's design response.

### Discussion

In North America, industrial designers tend to go into professional practice immediately upon completion of their Bachelor's Degree. They are likely to be involved in the development of mainstream products that are on the market in less than a year of their graduation from university. As educators, we recognise the importance of preparing our students for rapid immersion into the profession and we encourage the adoption and adaption of more empathic design research strategies for student designers. These less conventional design strategies require alternate interventions and support in order to provide a meaningful learning environment for all classroom participants.



Additional immersive empathic modelling studies are being developed that could lead to more in-depth understanding of others with visual impairments. Simulating walking in total blindness, the authors sought to assess the level of risk to the student and monitor the length of time it took to complete the task.



Figure 8: (a) (b) (c) and (d): Walking Blind

Figure 8 illustrates two significant moments during the study. 8a shows one author walking down a corridor in a public space where she feels completely alone. As we take a wider view in 8b, we see she was surrounded by students and colleagues. In 8c, another author is experiencing unexpected barriers that were above ground level.

This experiment certainly took the authors outside their comfort zones. Within only a couple of minutes, it became evident that their senses of hearing seemed ‘amplified’ and other senses seemed to compensate for the lack of vision. The difficulty of this exercise was significantly greater than anticipated, leading to a reduction in the distance they covered and a revision of the planned classroom activity.

A disability specialist at the University of Illinois at Urbana-Champaign raises concern over negative stereotyping of having disabilities and those living with disabilities:

*“...we want to be careful and mindful of how we present and execute simulated activities ... as they sometimes can backfire and perpetuate stereotypes rather than diminish them, even with good intentions.”<sup>19</sup>*

The authors continue to explore sensorial impairment as one of the multiple research approaches to help support understanding within the product development of everyday objects.

### Conclusion

Though our ideal is for all individuals to be able to conduct their daily lives without unnecessary challenges, we still have a long way to go, and the value of developing empathy cannot be underestimated. Why does oral contraceptive packaging offer no tactile indication to the user as to which pills contain the active medicine (e.g. weeks 1-3) and the placebo (e.g. week 4)? Picking up the packaging upside down could and taking the placebo instead of the active medicine could have serious consequences. Why do single serving coffee packs in hotel rooms, offer no tactile indication of which is caffeinated and decaffeinated? How does one operate a hotel shower if one is unable to read the visual cues? Though these may seem minor irritations for the majority, with the increasing proportion of our

population developing disabilities, they represent the constant erosion of one’s ability to function in an able-bodied world.

Designers, the designing process, and ultimately the resulting products are beginning to respond to authentic user needs. Health care maintenance is of critical importance as we strive to maintain a good quality of life for all. Shifting demographics will result in more seniors than ever before. As disability and aging are no longer perceived as a barrier to quality of life, products and environments that are less than empowering will no longer be acceptable.

The authors believe that there will be significant changes in personal and social engagement in the future. The individual will take more of an active role in their own health maintenance, with an emphasis on prevention rather than cure. The focus will be on weight management and wellness rather than superficial cosmetic surgery. We could be controlling our health care and medicine management via the web, as we now do our money. It is possible that video communication systems will replace person-to-person medical appointments, especially if touch and smell can be conveyed via computer in the future. Clothing will contain sensors and monitors that alert us to a drop in body temperature, salt levels in our perspiration, and urine concentration. Life-long learning will increasingly result in universities accommodating multi-generational classrooms accommodating students from ages 18–80+. Multiple careers for individuals have become more common, which requires a more flexible approach to education and to re-education. There is an overlap between the office and home as more workers telecommute and the numbers of home-based businesses increase. However, many people will continue to relocate for work opportunities which suggests an investment in customised housing units (e.g. modular systems), which can literally be relocated when we change jobs. Public and private space will continue to merge beyond what we have experienced today with Wi-Fi, constant electronic contact, and the need for social connectedness.

Focusing on the lived experience of users offers the product developer a significant resource to bridge the gulf between existing product solutions and future design outcomes that will enhance quality of life for all. Material landscapes need to be more empowering. Built environments need to consider users with various sensorial abilities. By including the marginalised voice now, we will be instilling the product developers of tomorrow with valuable insight, awareness, and sensitivity to their target users.

We recommend employing empathic research strategies early within the education curricula of designers to enhance their awareness of others. Rather than designing only for the mainstream and general user, let our designers design for real people. Enable them to begin “... listening to the voices of difference.”<sup>11</sup>



## References

1. Chapman J. Emotionally Durable Design: Objects, Experiences and Empathy. London: Earthscan; 2005.
2. Walker S. Sustainable By Design: Explorations in Theory and Practice. London: Earthscan; 2006.
3. Riggins SH. Fieldwork. "The Living Room" in S. H. Riggins, ed., *The Socialness of Things*. New York: Mouton de Gruyter; 1994.
4. Sudjic D. The language of things: understanding the world of desirable objects. London: W W Norton; 2009. p. 7.
5. Hansen N and Philo C. The Normality of Doing Things Differently: Bodies, Spaces and Disability Geography. *Tijdschrift voor Economische en Sociale Geografie*. 2007; 98 (4): 493-506. p. 498.
6. Americans with Disabilities Act [homepage on the Internet]. [cited 9 August 2009]. Available from: <http://www.eeoc.gov/types/ada.html>
7. Weightman D and McDonagh D. People are doing it for themselves. In: *Proceedings of the International Conference on Designing Pleasurable Products and Interfaces: 2003*; Pittsburgh, Pennsylvania: ACM Press; 2003. p. 34-39.
8. Clarkson J, Coleman R, Keates S, and Lebbon C. *Inclusive Design: Design for the whole population*. London: Springer; 2003.
9. McDonagh D. Do It Until It Hurts!: Empathic Design Research. *Design Principles and Practices: An International Journal*. 2008; 2 (3): p. 103-110.
10. Formosa D. Social responsibility through design: Smart Design calls for a wide-angle view of Universal Design. *Smart News* [homepage on the internet]. [updated 2006, cited 14 September 2009]. Available from: <http://www.smartdesignworldwide.com/news/article.php?id=98><http://www.smartdesignworldwide.com/news/article>
11. Galanakis M. *Space Unjust: Socio-Spatial Discrimination in Urban Public Space. Cases from Helsinki and Athens*. Helsinki: Helsinki, Finland School of Design, University of Art and Design; 2008. p. 23.
12. Strickfaden M, Devlieger P, and Heylighen A. Building empathy through dialogue. In: Malins J editor. *Proceedings of the Eighth International Conference of the European Academy of Design*. Design Connexity; 2009 April; Aberdeen, Scotland: Gray's School of Art; 2009. p. 451.
13. Denton H and McDonagh D. Using focus group methods to improve students' design project research in schools: drawing parallels from action research at undergraduate level. *International Journal of Technology and Design Education*. 2003; 13(2): 129-144.
14. Fulton Suri J. Empathic design: Informed and inspired by other people's experience. In Koskinen I, Battarbee K, and Mattelmäki T, editors. *Empathic design: User experience in product design*. Helsinki, Finland: IT Press; 2003. p. 52.
15. Plowman I. *Ethnography and critical design practice*. In Laurel B, editor. *Design research: Methods and perspectives*. Cambridge, MA: MIT Press; 2003. p. 34.
16. Hoffman ML. *Empathy and moral development: Implications for caring and justice*. New York: Cambridge University Press; 2000. p. 4.
17. Hickman R. *Why we make art and why it is taught*. Bristol, UK: Intellect. 2005. p. 138.
18. Goldstein E. *Applications of Universal Design to Facilities*. In Burgstaher SE and Cory RC, editors. *Universal Design in Higher Education: From Principles to Practice*. Cambridge, MA: Harvard Educational Press, 2008. p.211.
19. Heft Sears S. In personal correspondence with the authors (October) 2009.

## PEER REVIEW

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## CONFLICTS OF INTEREST

The authors declare that they have no competing interests.