DISEGNO

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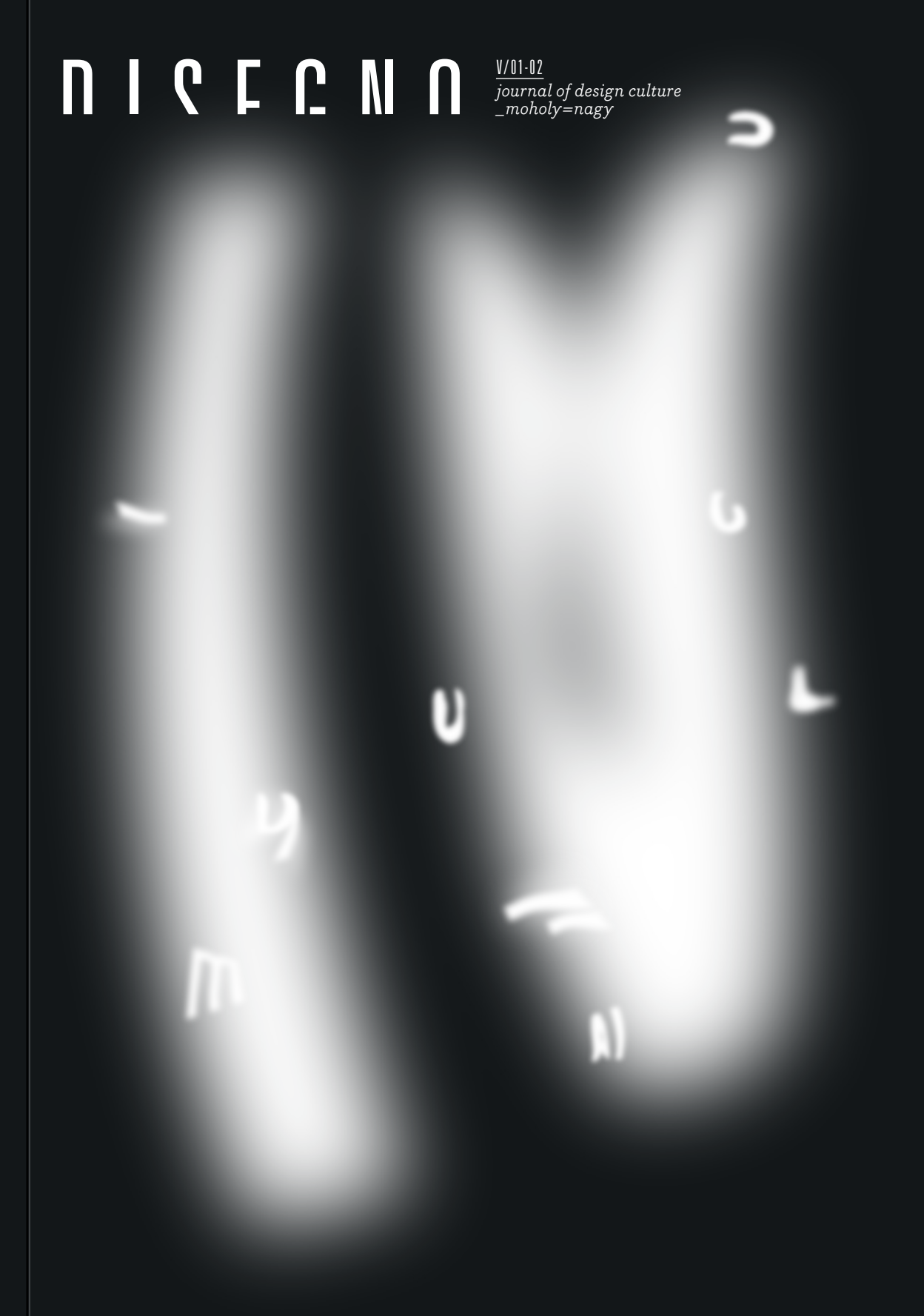

Disegno

Journal of Design Culture

Double-blind peer-reviewed, open access scholarly journal. Not for commercial use.

Aims and Scope

Disegno publishes original research papers, essays, and reviews on all aspects of design cultures. We understand the notion of design culture as resolutely broad: our aim is to freely discuss the designed environment as mutually intertwined strands of sociocultural products, practices, and discourses. This attitude traverses the disciplinary boundaries between art, design and, visual culture and is therefore open to all themes related to sociocultural creativity and innovation. Our post-disciplinary endeavor welcomes intellectual contributions from all members of different design cultures. Besides providing a lively platform for debating issues of design culture, our specific aim is to consolidate and enhance the emerging field of design culture studies in the Central European academy by providing criticism of fundamental biases and misleading cultural imprinting with respect to the field of design.

All research articles published in Disegno undergo a rigorous double-blind peer review process.
This journal does not charge APCs or submission charges.

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ABSTRACT

The raw material-centric and holistic designer attitude has become a subject of design education in recent years. This approach is expanding and has adapted itself to the full scope of advanced capitalism, including consideration of the use of raw materials, market reception, and the environmental aspects. The pedagogic roots of the new perspective, such as the DIY approach and the origins of the expressive sensory atlas, can be traced back to the Bauhaus foundation courses. Tactility is today the starting point for examining consumer behavior related to the market success of raw material developments. The pilot courses, launched in collaboration with Italian and Dutch technical and art universities, are based on the methodologies of Itten and Moholy-Nagy and examine our relationship with raw materials and their unexplored possibilities. Moholy-Nagy's approach of seeking solutions to life's problems not in isolation but bearing the community's interests in mind was revived by Victor Papanek in the 1970s and has recently been renewed in Alice Rawsthorn's expression "attitudinal design." The raw material-centric pilot courses of the previous years have now become permanent at European art universities. This article introduces the methodological approaches to raw material-centric design, that are built on my own experiences and innovative solutions. The holistic view of these approaches combines Moholy-Nagy's "material-form-function" unity with the motivations behind consumption and the sensory properties of materials.

#attitudinal design, #DIY approach, #methodology, #raw material, #sensory dimensions

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DESIGNER ATTITUDE

"Designing is not a profession but an attitude." This is how László Moholy-Nagy defined the enlightened concept of design in his book *Vision in Motion* in 1947 (42). According to Moholy-Nagy, the profession of the designer should be separated from the notion of a specialist and must be transformed into an improvisational, instinctive, and inventive attitude that goes beyond merely adapting products to limitations in systems of production. With this new approach, the work of the designer should not take place in isolation but should consider instead the aspects of a community and focus on real social problems. (Compton 2020, 169). Even though the prophetic value of Moholy-Nagy's writings were not recognized at the time, and his message in a bottle awaited the understanding of another age (Wyss 2007, 59–60), his thought is relevant in the current conditions of industrial production. In his time, the excitement of mass production and economic opportunities it provided overshadowed the holistic and conscious approach to designer attitude. As a consequence, the endless possibilities of material developments were celebrated without much thought for the long-term consequences. Today, when (after losing their functionality) objects leave behind accumulating materials whose decay time is disproportionately longer than the time of their use, solution strategies need a paradigm shift and a holistic approach. This is why the "artist-engineer" designer approach comes to the fore.

The XXII. Triennale di Milano, organized in 2019 and titled *Broken Nature* drew attention to the determining problem of our time: the broken relationship between nature and humans. In connection with the solution-centric exploration of ecological problems, the role of design as the "agent of change" was given a prominent place in this exhibition, reviving Moholy-Nagy's approach. The "Design Emergency" manifesto by the event's curators Paola Antonelli and Alice Rawsthorn not only celebrates the opportunities for design to unfold, but also aims at its redefinition, supporting design's mission as a comprehensive tool for making the world a better place. In their view, design is a way of seeing the world and of communicating with it, a tool that can help solve a wide range of issues such as climate change, dysfunctional social care systems, social injustice, or global health emergencies. By introducing serious subjects and an ambitious approach to design culture they want to call not only leading designers but also global companies to action. Design becomes an attitude regardless of the scale of efficiency when

it is goal-oriented and the available assets are utilized in the most economical, efficient, safe, and elegant way. Design can help inform, connect people and shape society (Compton 2020, 170).

Rawsthorn's term "attitudinal design" (Rawsthorn 2018) seeks to emphasize an approach in which the designer does not work to further his or her reputation, but to contribute to solving a global problem through greater collaborations. Coordination of disciplines becomes crucial, and design gains the trust of other professions if expertise is applied smartly and sensitively; thus designers need to be prepared for real collaborations with other professionals (Rawsthorn 2020). Moholy-Nagy's vision was therefore only waiting for its time to come, a time that needs a larger perspective and a more global approach in the field of material use.

RAW MATERIAL - CENTRIC DESIGN

Raw material-centric design seeks solutions to problems arising from the material used in mass production and does so by revisiting residues from industrial production. In addition, it provides an alternative to the use of non-degradable materials by exploring natural renewable raw material sources for the industry, the market, and the consumer. The holistic approach supports more sensitive solutions developed by the harmonization of local resources, labor, community, and culture. The approach based on the in-depth examination of materials takes their physical, chemical, and also sensory properties into account. It expands the aspects of object design from the selection of raw materials through market success to tracking the entire life cycle of an object, seeking balance through learning about consumer behavior by aligning our material-use culture with evolving raw material approach and resources.

Studies examining the effects of raw materials on the senses and the factors influencing consumer decisions draw attention to the possibilities of the designer and, with it, the increasing responsibility of his or her decisions (Karana 2009; Karana, Hekkert, and Kandachar 2009). Just as a more holistic understanding of the design implications of the phenomena behind the reduce-reuse-recycle initiatives of the 1990s (McDonough and Braungart 2007, 59–84) has inspired a circular manufacturing approach in industrial production (Bell 2020), a similarly significant shift in restoring balance to our object culture can result from observing consumer behavior. By integrating the experiences gained from this field into work, design could take on a dominant role.

Given the current problem of object accumulation, the effect of materials on users' sensory organs is of overriding importance and leads to the recognition of an emotional connection between object and user, influencing the lifespan of objects (Karana 2009). This means that understanding the sensory nature of materials and then adapting it to their function can be a new point of view in design processes (Folkman 2010). Furthermore, the ideal combination of sensory material and function can increase the service life of objects by strengthening our

attachment to them. Therefore, in addition to the assessment of aesthetic and perceptual values, as well as the associations evoked by cultural backgrounds, trends, and materials, evoked emotions must also be taken into account in design decisions (Rognoli 2010). Recognizing the significance of this, the Material Experience Lab, founded by Elvin Karana, and in collaboration with the Delft University of Technology, examines the properties of raw materials, the background of the relationship between materials and people, and the process and possibilities of attitudinal change. Interacting aspects open up new areas for material and product design by exploring the technical properties of materials and the layers of meaning inherent in them that categorize consumer emotions and reactions evoked through associations.

The term "material experience" introduced by Karana defines results that can be integrated into material design, grouped around aesthetic experience as sensory effect, meaning, and evoked emotional experience, triggering a performative effect (Karana et al. 2015). (Fig. 1)

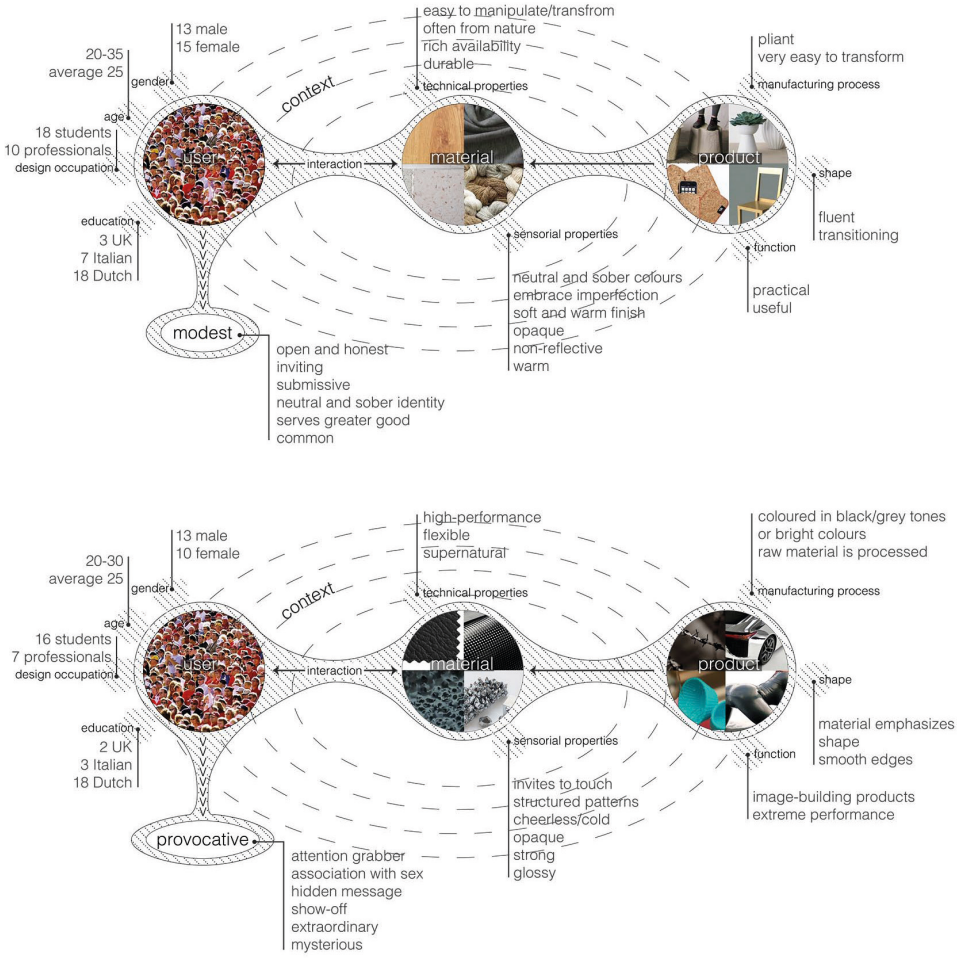

FIGURE 1. *Visualization of "modest" (above) and "provocative" (below) data sets as "materials experience patterns" based on Karana 2009. Source: Karana et al. 2015, 44.*

The aim of the research is to understand and define the physical, biological, social, and cultural conditions that affect a person's experience with materials, given that the introduction of new materials and the elimination of old ones ultimately depends on the consumer's decision. The iterative and empirical research processes they apply are key to the success of raw material-centric design, which, in addition to discovering and integrating renewable raw materials that can replace currently used materials detrimental to our health and environment, can also restore the relationship between nature and humans. Observing the success of the use of innovative materials, the analysis of the relationship between consumers and materials can shorten the development periods and predict market acceptance, which can lower the risk of material development while making it faster and more efficient (Karana et al. 2016).

Today's practice-oriented approach to research focuses on the three stages of design processes. First it focuses on material choice, which involves the exploration of meanings (Karana, Hekkert, and Kandachar 2010), then, on understanding the motivation behind consumer choices, which informs the comprehension of market processes and the predictability of a product's success (Van Kesteren 2008), and finally, on improving the knowledge about material and technology (Rognoli 2010), which seeks to strengthen interdisciplinary communication and thus the efficiency of production processes. This strengthens communication between the disciplines and thus the efficiency of the production processes.

RAW MATERIAL CENTRIC DIDACTICS/METHODOLOGIES IN DESIGN EDUCATION

Thus far in design education, only a few experimental courses have addressed the exploration of deeper material knowledge, such as sensory dimensions and emotional or associative effects. The methodological integration of these aspects into education was, until recently, undeveloped (Rognoli 2004). Recognition of this lack was behind the launch of areas of research and development methodologies that help students and professionals in the practical application of new aspects of their work.

In what follows, I am going to present the basics and tools of the methodology of multi-sensory material knowledge dimension, developed by Elvin Karana, Associate Professor of Design Engineering at Deft University of Technology and Valentina Rognoli, Associate Professor at the Politecnico di Milano Design Institute, the development of which has started in recent years in the framework of laboratory project work and experimental courses. Today's raw material-centric design goes back to the methodological roots of the Bauhaus. This reference is essential for an in-depth approach to the study of materials, to think it further, and complemented it, for example, with the analysis of the opinions on new material developments and the subjective and objective dimensions of material perception.

The basics of the approaches focusing on the involvement of sensory dimensions lead back to the theme of the foundation course developed at the Bauhaus. Both Itten and Moholy-Nagy's approaches emphasized the importance of the role of sensory encounter and practical elaboration in understanding materials, which, when integrated into design activities, enrich the intended experiences of final designs (Itten 1975; Wick 2000). The Bauhaus teachers were primarily creative artists rather than educators and therefore their methodologies were typically developed from practical experience. The Bauhaus concept of the unity of individual work and teamwork, arts and technology, science and craft aimed at the mutual transmission of explicit and implicit knowledge. Those who experience how theoretical knowledge is translated into practice no longer insist on the separation of manual and intellectual work (Brock 2021).

Itten's "theory of opposition" was part of the foundation course. He asked students to examine sensory contrasts relevant to materials, such as smooth-rough, soft-hard. His theory of contrasts has drawn attention to the "nature" of materials, which aims to present the characteristic properties of the material in a variety of ways. Nevertheless, the contradictions were also to be felt, not just seen. With Itten's approach, his students could experience the physical nature of materials directly through practical exploration (Itten 1975). Following Itten, Moholy-Nagy developed a new course focusing on the tactile experience of materials (Wick 2000). In his methodology, the emphasis shifted from the experience of seeing to the perception of touch. In order to do this, he set up tactile tables on which materials were arranged according to specified sensory criteria. Similarly Albers, who took Itten's position after he left the Bauhaus, like his predecessor, applied tactile boards to improve material perception. However, in his design approach, the purpose of working with material was to explore deeper physical properties in addition to learning about their basic properties. Through manual processing and interventions manipulating the structure of the material, the new properties of the materials and, consequently, new areas of use have also been investigated (Droste 2003, 140–42).

The DIY approach to material development at Dutch and Italian universities introduced by Rognoli not only observes the physical and sensory properties of materials, but, in response to the challenges of today's material developments, also examines the evoked associational effects, which might additionally influence our perception of unknown materials. The elicited reactions are categorized along the color, surface and texture of the materials and grouped along associations that strengthen and weaken trust. Further material development will evolve in all directions, taking the results of the survey into account, aiming at increasing positive reception until further responses are surveyed. To analyze this, a tool for the evolutionary map of material change was developed. By drawing this map, the development of the user's reaction is examined step by step. The results make it possible to categorize the

FIGURE 2. *Experiments with textures and seeds in "A Matter of Time" by Stefano Parisi, Master of Science in Product Design for Innovation graduation project, supervised by Valentina Rognoli, School of Design, Politecnico di Milano, 2015. Source: Parisi, Ayala Garcia, and Rognoli 2016.*

experiences gained by observation according to character, match, deficit, and benefit. (Rognoli 2016, Karana et al. 2016) In-depth knowledge edge of the emotions evoked through associations has become a market advantage, with the predictability of the emerging materials' reception and popularity (Karana et al. 2015, 48–49).

The starter tool of methodologies inspired by Bauhaus founders, are material samples and associated concise text definition cards that explore the description of materials simultaneously with different senses, emphasizing possible dissimilarities. Sensory practice using material samples, in which the samples are ranked according to a particular aspect, leads to a different result in each case. The so-called expressive sensory atlas applied at Dutch and Italian research laboratories is used to show the quality dimension of materials, with differences between subjective and objective perception in terms of material, color, and structured surfaces (Rognoli 2010). The interactive work model they use as an educational tool is based on the organic, simultaneous expansion of user requirements and experiences. However, the atlas is not a "catalog of existing knowledge", that is to say, not only is it a surface that conveys knowledge, but it is directly involved in shaping the culture of raw materials and in consolidating the new concepts that form the basis of expressive sensory description of materials. It is a tool that

designers and practitioners can utilize to interpret the complexity of phenomenological, perceptual and sensory aspects of materials (Rognoli 2010, 297), and thus help reconcile the needs of consumers with the developed materials.

EXPERIMENTAL COURSES

The experimental courses on the research investigating the materials' effects on the senses took place at the Material Experience Lab operating beside the Deft University of Technology and the research laboratory of the Politecnico University in Milan. The courses examined the application of theory to practice using the expressive sensory atlas. In their view, the methodology is a suitable starting point (Rognoli 2010, 297). The first studies on DIY approaches focused on natural, recyclable raw materials such as long-life wool (Rognoli 2015). These were then complemented with an examination of biodegradable alternative raw materials (Ayala Garcia and Rognoli 2017) as well as mycelium-based developments (Parisi, Ayala Garcia, and Rognoli 2016). (Fig. 2).

In addition to laboratory experiments, opportunities to collaborate with students were provided first by the London-based Royal College of Art and then by the Central Saint Martins Universities at semester-long design courses, integrating the methodology into design education. Thanks to its popularity and success, the raw material-centric design approach has now developed into an elective major in MA training at several Western European art universities. The courses, called Material Future,[1] explore the possible development directions of renewable raw materials based on methodological foundations. By studying and harmonizing the chemical, technological and aesthetic possibilities of the materials, they are searching for in-depth answers to raw material problems of our age. The continuity of this mentality is noticeable in the design career of the graduates, and therefore the developed materials are in most cases tested in the market. Due to increasing success, design based on raw material developments has already appeared and is prized as a separate category at the design competitions of recent years.[2]

CONCLUSION

In developments starting with the discovery of renewable raw materials, which anticipate an exciting paradigm shift in the approach to the material culture of our time, the holistic design attitude of Moholy-Nagy, including the cooperation of the disciplines and the unifying presence of the designer, plays a key role. However, his ideas, which transcended his time, would make an impact only generations later (Moholy-Nagy 1996, 334). Nevertheless, the methodology of the research conducted by Karana and Rognoli has significantly shortened the time between developments and subsequent impacts. They see the solution in the

[1] *For example: Central Saint Martins, Royal College of Art, Iceland Academy of the Arts, Aalto University, TU Delft, Politecnico di Milano.*

[2] *See for example: New Material Award, Hublot Design Prize, Dutch Design Award, Future Award, AFFA Materials Innovation, LEXUS Design Award*

development of a common language between disciplines, and in understanding the motivations of market players. Moholy-Nagy's thoughts have therefore been honed and have a renewed relevance in line with the pressing need today for a large-scale cooperation, in accordance with practice-oriented visions adapted to solving issues that affect our environment.

Facing the intense competition for success of material developments, which is today defined by market acceptance and consumer choice, design challenges are complemented by the ability to overcome general prejudice and mistrust. The study of evoked emotions is rooted in the foundations of the Bauhaus. The tactile approach, and, in addition, the associative background induced by aesthetic and sensory senses also plays a prominent role in the evaluation of the material.

The phenomenological approach of traditional and newly developed materials opens up innovative possibilities in design education as well. The approach of the designers of the "future" includes not only objective and technical knowledge about raw materials, but also the study of the subjective senses (Rognoli 2010). Raw material-centric design, which takes the exploration of the unique properties of a material into account, and thus can provide answers to complex questions of object design, can also gain competitive advantage in the market by exploring sensory reactions. In addition to evolving material development trends, didactic approaches are also gaining an increasingly important role in the higher education of designers, influencing the views of the generation that is shaping the material culture of the future.

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