

A PAN-EUROPEAN TRANSFORMATION TO BRIDGE THE GAP BETWEEN TANGIBLE EXPERIENCE AND VIRTUAL IDEATING SPACES

Marina-Elena WACHS¹, Theresa SCHOLL² and Giulia D'ALEO³

¹Hochschule Niederrhein – University of Applied Sciences, Germany

²Textile Engineer, Germany

³Master Student from Politecnico di Milano, Italy

ABSTRACT

Pan-European design innovation needs new spaces for ideation and ongoing transformation. The key to this transformation is a symbiosis between ‘interactive learning and ideating landscapes’, and respecting mixed-stakeholder interests. It is important not to separate the academic and industrial spaces from one another, we have to bridge the gap between these – ‘osmotic ideating spaces’ can be the future.

When building innovative cross-border experiences, the design research approach is more useful than ever, with its greatest influence being on interdisciplinary fields. Attention can be drawn to digital interaction design, as a practice that balances behavioural and computer sciences that are used to direct the development of technology towards human desires, emotions and needs.

One way of (co-)designing draws a new focus to the field of design education. Because the interactions with humans are not as predictable as those with a technological component; we need social sciences, such as ‘ethnography’ in the field of hardware design education.

Finding a balance between the needs and interests of different stakeholders, and between the perspectives of UX and product design, it becomes irrelevant whether they are a student or an entrepreneur, they are ideating together in a sustainable social interaction. From an economic *and* didactical point of view, this benefits all parties. A great parameter for transformation is to *regenerate* designing experiences in relation to our ‘values’ as humans; this is when the ‘design engineer artist’ becomes the innovator and is responsible for the success of the transformation and reaching the SDGs.

Keywords: Pan-European osmotic designing spaces, sustainable societal innovations, disruptive management as wishful thinking, design engineer artist as innovator, balancing knowledges for SDGs

1 INTRODUCTION

Europe needs different stakeholders to come together into osmotic ideation spaces, in which it will be possible to envision and design solutions capable to manage the complexity of the challenges framed by the Sustainable Development Goals agenda. We have to create pluralism in the (design) industry through ‘osmotic ideating spaces’ [1] as a future model – a useful instrument for achieving more SDGs (Sustainable Development Goals) [2]. Within these generating fields, *disruption* can be a worthwhile didactic element in evaluating process management.

The next chapters will examine whether we need a new form of designing across disciplines and cultures to find answers to this thesis. Creative thinking and practices have been increasingly praised for their ability to cut across disciplinary borders, thus becoming a new engine for innovation [3]. Nowadays several research laboratories and tech companies are driven by mixed teams, where artists and designers work together with scientists, developers, entrepreneurs and activists to shed light on current developments in our digital society.

Designers are used to gathering qualitative and quantitative data that enables them to have a broad understanding of the problem. Their unconventional way of tackling and representing complexity is what can help smooth the frictions among different disciplines [4]. While focusing on user experience [5], creating a perfectly shaped product is no longer the main focus of industrial design. When a digital service is added to a product, it enables feedback to be obtained from the customer and the product to be updated during its lifecycle. In consequence, chapter two focusses, on the one side, on new forms of

interaction design in education and businesses strategies, and, on the other side, the value of new forms of storytelling – because narration and cross-cultural understanding create the pluralistic process, that we need for different learning and ideating levels within the post-digital era.

Our European collaboration – from different countries and different areas of work – demonstrates, from the perspective of both the industry and academic institutions, how to combine the respective skills and invest in self-management. Challenges in bridging the gap between disruptive design areas and the design experiences, which must be created for a sustainable future, are described in chapter three (3) with the help of case studies that focus on the following research topics:

- ‘Osmotic’ creative spaces – to build new ‘bridges’ for creating mixed media spaces
- Disruption as wishful thinking – involving new subjects in the process demands mindful flexibility, which never takes place without friction, a kind of ‘inharmonious management’
- Narrative tools like ‘new storytelling’ serve as a bridge between material and immaterial design engineering spaces – to mediate between tangible experiences AND virtual ideating spaces.

All these research topics are summed up and evaluated – in relation to the SDGs, the didactic value and economic application – see chapter four (4).

The benefit of the interlinked, cross-cultural and cross-disciplinary collaboration was and is the successful European transformation towards balancing the ‘un-tangible’ laboratory, thus, ideating the best sustainable solution in Europe’s design engineering post-digital era.

2 CREATIVE THINKING NEEDS MORE INTERACTION – RELATED TO SDG NO. 3 + 12

2.1 New forms of design will shape behaviour in a digitally-based world

Currently, scientific research is driven by a surge in technological and engineering sciences as a result of enormous budgets that are supporting the digital transformation in the EU. [6] Creative disciplines, social sciences and humanities in this phase of technological development must find ways to bridge the gap between the sciences, society and the environment. Design can be seen as a useful discipline that can be integrated into R&D processes, thanks to the ‘indeterminate’ nature of its subject matter [7] and its ability to understand hidden relationships in ‘wicked problems’ through meaningful visualizations [8].

Interaction designers are a good example of how design penetrated the field of human-machine interaction. Their education includes knowledge from both IT and the behavioural sciences, which help them design products and systems with a fine equilibrium between the functions and behaviours. This is carefully achieved by defining ‘the who, what and how of interaction’ process. [9] Interaction designers could be seen as shapers of behaviour. This crucial ability proves its value when facing social and cultural problems that are difficult to solve. For instance, one of the greater challenges that the 2030 Agenda for Sustainable Development places at the centre of a new developmental vision is good health and well-being (SDG No. 3). This can be achieved if people are able to access quality assistive products when and where they need them. [10] QBreathe, a project developed at the Polytechnic University of Milan, by students enrolled in the MSc in Digital Interaction Design programme, is an example of how an IoT product associated with an application can help people with problems related to stress and help them develop healthier habits – see Figure 1. This map represents the experience of using an augmented fidget gadget, which take advantage of humans’ tendency to release their stress by pressing buttons to detect their stress level. If it is too elevated, the product suggests that the user perform a breathing exercise, providing a quick fix to their anxiety crisis. On the other hand, the app keeps track of the sessions and, through subtle hints, reminds the users to practice their breathing. In such a manner, the product helps people engage in a behavioural change cycle that helps them acquire resilience over time. Finally, a pulse sensor embedded in the object allows the heart rate to be detected and can check the user’s blood pressure. This shows how user-centred methods applied to the development of man-machine interactions within the 21st century can play a central role in the democratic availability of technologies, making them truly capable of empowering humans in their daily lives.

Assistive technologies and design for behaviour change

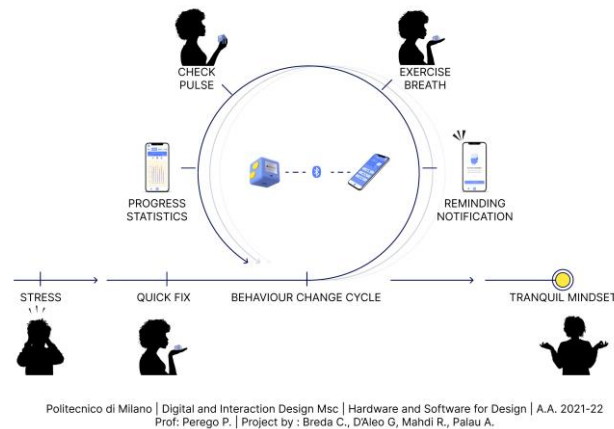


Figure 1. Map showing the experience of behaviour change triggered by QBreath, IOT+app assistive technology system

2.2 Transformation in product design regarding sustainable product-user-interaction

With the increasing focus on user experience, creating a perfectly shaped product is no longer the main focus of industrial design. [11] This shift is leading to a change in the way product designers define themselves. It is crucial to be more than just a craftsman with an excellent sense of shapes and materials. More than ever, designers have to be aware of the potential interaction between a product and its user, and how digital services create a connected system related to an object. Theories like Design Thinking or Interaction Design are currently at the centre of attention. [12]

However, in today's industry, product designers – and especially their clients – often tend to focus on the product itself, production methods and sales strategies instead of the users' needs and desires. [13] Since the interaction with humans is not as easy to predict as the functions of technologic components, a new focus on social sciences, like ethnography, is needed in the field of industrial design education. [14] This change brings a huge potential for the relationship between the designer of a product and its users. If a digital service is added to a product design, it is also possible to receive feedback from the customers and update the product during its lifetime. [15] This new way of (co-)designing is resulting in more sustainable products because they actually match the users' needs and can adapt to new circumstances.

Adding a new medium to a product design – in this case, digital services – also leads to a new way of storytelling. A simple, non-digital product, like the fashionable IT bag of the season, tells the story of being desired, a style icon. However, if the interaction with the product is brought more into focus than the product itself, the story also has to change. The product should tell its user how it would like to be handled to perform best, and what kind of different interactions are possible between the product and its user. [16]

For this new way of storytelling, the so-called 'Offenbacher definition of product language' by Dagmar Steffen – and consideration of Jochen Gros's preconditioned framework – serve as a good knowledge base. [17] In order to create a story of usage around a product, it is important to understand the product's language first. Storytelling has to transfer this language in a unique way to create a credible narration, which can influence the relationship between the product and its user. [18] A good starting point for creating such a story is the choice of material. According to Gernot Böhme, materials have a very amorphous character and are part of the product's atmosphere, because materials 'create' products. In our unconscious mind, materials are linked to synaesthetic perception, cultural codes and interpersonal experiences. In the relationship between the product and its user, the material can influence what the user feels while looking, touching and using the product. [19]

Considering the SDGs, in particular goal number twelve (SDG No.12), it would be interesting to understand how the story of a product, especially as told through the selected material, could create a more sustainable use of the product by its user. An example that emphasises this consideration is the comparison of the Italian design factory Alessi and the Scandinavian-based brand Stelton; both produce housewares and kitchen items but have a different focus. Alessi is well-known for very poetic and brand shaping designs and is not as focused on material choices and functionality as Stelton, which focuses

more on products with high usability and material-appropriate processing. [20] So, from the perspective of product-user-interaction, what would now be the more sustainable product – the emotional one or the functional one?

3 BALANCING DESIGN AREAS – PLURALISM IS KEY

3.1 Interconnected European designing – Osmotic creative spaces

Finding a balance between the different design perspectives of UX and product design ‘generating’ programmes, regardless of if you are a student or an entrepreneur, you are ideating together.

The challenges faced when bridging the gap between the co-ideating spaces are as follows:

The transformation is a question of two essential elements: Firstly, the challenge lies in motivating the members of enterprises/institutions, and designers/design students, of course, to collaborate and develop their skills, and convincing them to invest in self-management – this is not a question of ‘continuing education’ [21] and ‘coaching courses’ [22] within industry or universities. Secondly, this ‘motivation to act’ correlates to osmotic learning and designing spaces [23]. Utilising this interdisciplinary design field involves technical virtual connected areas, on the one hand, while it is characterized by osmotic learning levels on the other: Different learning taxonomy levels of different participating partners are beneficial for the process and the result. That means teenagers, students, managers, experts, and teachers all come together in stress-free creative learning spaces, non-hierarchical creative landscapes around Europe [24]. The didactic benefit of this form of co-designing is that the young generation of students and teenagers who participate can learn from the experiences of experts and managers, and vice versa. This allows the managers to gain insights into the naïve view of teenagers and students. These different perspectives illustrate the pluralistic points of view as wishful thinking in designing – not only in Design Thinking.

In addition to building new ‘bridges’ by creating mixed media rooms, this approach is supported by the worthy pedagogical aspect of tangible experiences, which can be combined in virtual learning landscapes through materialized storytelling [25]. Pan European workshops in Germany and Great Britain gave reason by ‘materializing immateriality workshop method’ in the year 2019 [26] for recovering the cognition-based experiences within the designing process for diverse partners.

3.2 Building bridges – making experiences in design spaces possible – free the artistic experiment to accept the disruption of a ‘new design engineer artist’

When it comes to ‘designing experiences’ or offering experiences in the design process as a design didactic approach, we have to regard different types of experiences, which is taken from the industrial practitioner’s point of view, according to Rossmann and Duerden. Their aim was to define a framework of experience types and ‘[...] to introduce (you) to approaches and tools that will allow you to practice experience design more effectively and systematically.’[27] But is this the main focus of the design process with tangible experiences? Could this *performed* frame for experiences guarantee a frictionless, smooth design process for ideating sustainable solutions? Based on the European design didactic teachings, we may consider ‘failure’ [28] and ‘voids’ (R. Sennett) and disruption to be beneficial and a playful frame for greater and more expansive variations of design pathways in the future. Richard Sennett describes the negative impact of only using CAD systems for designing, focusing on an ‘overdetermined planning’ [29]. Introducing disruption to the process can offer a kind of inharmonious management, leading to a reflection upon and rethinking of the design. This element is beneficial to both the mind and hand coordination, as well as thinking through drawing. The experience of drawing and explaining your sketch to other people leads you to re-value and evaluate your design; you sketch again, and this is worthwhile as a repetitive evaluation process of the result.

In the Digital Era, learning and working conditions will benefit artistic experimentation, giving voids, failure and disruption a chance, in the stress-free environment of using artistic media: This could represent a re-evaluation of the ‘designer engineer artist’ [30] of former times.

4 EUROPEAN TRANSFORMATION IN BRIDGING THE ‘UN-TANGIBLE’ LABORATORY TO PRESENT DESIGN PRACTICES

4.1 How to push stakeholders to engage more in *socially* relevant SDGs

Experience matters – again! As we have seen, the ‘motivation to act’ and change your habits, or to develop your skills – through self-management in each stage of your education or career – transitions through different steps of education and experiences in the digital post era. But what is a great experience today and in the near future – in 2030? How does it relate to the need for changes in habits that facilitate a better relationship to the SDGs? From the pedagogical perspective and design didactical point of view, with a focus on hands-on design *and* digital designing experiences, it is part of a new ‘educare’ [31] space, in which the young talents are mentored and offered spaces for designing in a flow. No fear of ‘white paper’. Let us encourage young people and teenagers to work together seamlessly with experts and designers, for a sustainable mixed media environment: analogue, tangible and digital – all connected in Europe, more than ever before – with the value of narrative tools, like a new form of storytelling (see above).

Designing experiences and creating spaces for experiments – UX design, co-designing, and the customers’ perspectives are related to the motivation to act. And the instruments that Wachs describes as ‘inharmonious management’ [32], or disruption as wishful thinking, can be used to involve new subjects in the process. This demands mindful flexibility, and never occurs without friction.

4.2 Sustainable change in creating open spaces for sustainable behaviour

As the augmentations in chapters 2.1 and 2.2 demonstrate, it is possible to learn more about the users’ needs and desires through design disciplines, like digital interaction design. Keeping this in mind should be the focus of today’s product designers. With regard to sustainability, it doesn’t matter if we create more emotional products or ones with high functionality: The most sustainable products are those that help the users in their daily life, offer the joy of use and are adaptable to new circumstances. Sustainable change can’t be designed on a piece of paper, designers have to study humans’ experiences and create tools and spaces that can change habits in daily – sustainable – product-user-interactions. It is impossible to solve serious environmental issues with one design, but we can design products that lead to sustainable activities and behaviour.

4.3 Creating a balance between engineering and social sciences – how designers can take part in the European transformation

Europe needs a new generation of designers, who are able to reshape behaviours as well as empower and help people walk their way towards a more sustainable lifestyle. To do that, they have to be able to penetrate other intellectually robust fields, like tech, medicine, policy, or law, thereby bridging the gap between the sciences, society and the environment. Designers will need more knowledge to be able to communicate with researchers and developers with different backgrounds and, therefore, they have to develop some key qualities. Firstly, they need to be educated on interaction, experience and service design. Secondly, they need to develop methodologies to validate and assess their assumptions and design proposals. The tools for these products are interlinked ideating spaces, experimental research and disruptive management processes. Thirdly, though not finally, they must develop appropriate methods for sharing their process in a suitable and scientific way.

If all these steps are realized in a corporative European interactive and ideating space – as well as impulse exchanges with different stakeholders – didactic, economic and socially sustainable gains are obvious. Mind the gap between Design Doing and Digital Interaction Design.

REFERENCES

- [1] Wachs M.-E. *Design Engineering – sustainable and holistic*, 2022, p. 82 (avedition, Stuttgart).
- [2] United Nations, *The 17 Goals*. Available: <https://sdgs.un.org/goals> [Accessed on 2022, 20 February], (2020).
- [3] Catricalà V. *The Artist As Inventor: Investigating Media Technology Through Art*, 2021, pp. 9-13 (Rowman & Littlefield, Lanham).
- [4] Kolko J. *Thoughts on design*, 2011, p. 40 (Morgan Kaufmann, Burlington).
- [5] Kalbach J. *Mapping Experiences: A Complete Guide to Creating Value Through Journeys, Blueprints, and Diagrams*, 2016 (O’Reilly Media, Inc., Newton).
- [6] Negreiro M. and Madiega T. *Digital transformation*, 2019, Members Research Service PE 633-171 June 2019, p. 5-6.
- [7] Buchanan R. Wicked Problems in Design Thinking, in *Design Issues*, 1992, 8(2), p. 16 (Mit Press, Cambridge).

- [8] Kolko J. *Thoughts on design*, 2011, pp. 96-100 (Morgan Kaufmann, Burlington).
- [9] Hassenzahl M. Experience Design: Technology for All the Right Reasons, in *Synthesis Lectures on Human-Centred Informatics*, 2010, pp. 11-13, (Morgan & Claypool, San Rafael).
- [10] Tebbutt E., Brodmann R., Borg J., MacLachlan M., Khasnabis C. and Horvath R. *Assistive products and the Sustainable Development Goals (SDGs)*, 2016, <https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-016-0220-6>.
- [11] Stevens G. *Soziale Praktiken als Gegenstand der Gestaltung*, In *Das Design Digitaler Perspektiven*, Denzinger, J. (Ed.), 2018, p. 98, (Birkhäuser, Basel).
- [12] Norman D. A. *Die Zukunft des Design: Die Entscheidung für einen Weg? Nimm beide*. In *Das Design Digitaler Perspektiven*, Denzinger, J. (Ed.), 2018, pp. 16-23, (Birkhäuser, Basel); see: Norman, D. A. *The future of design: When you come to a fork in the road, take it*. In *Design X*, Gianni Sinni (Ed.), 2016, pp. 193-306 (Macerata).
- [13] Spellmeyer G. *Materialimpulse*. In *Die Sprachen des Materials*, Wolfzien, F./Scholz, M. (Ed.), 2016, p. 38, (Reimer, Berlin).
- [14] Oswald D. *Digitale Produktsprache - Produktdesign und Designstudiengänge in Zeiten der Digitalisierung*, In *Das Design Digitaler Perspektiven*, Denzinger J. (Ed.), 2018, pp. 60-70, (Birkhäuser, Basel); see: Oswald, D. *Towards a Redefinition of Product Design and Product Design Education*. In *12. International Conference on EPDE*, 2010 (Glasgow).
- [15] Stevens G. *Soziale Praktiken als Gegenstand der Gestaltung*, In *Das Design Digitaler Perspektiven*, Denzinger, J. (Ed.), 2018, p. 98, (Birkhäuser, Basel).
- [16] Ruf O. *Storytelling für Designer*, 2019, p. 95f (avedition, Stuttgart).
- [17] Steffen D. *Design als Produktsprache – Der „Offenbacher Ansatz“ in Theorie und Praxis*, 2000, (Verlag form).
- [18] Ruf O. *Storytelling für Designer*, 2019, p. 95 (avedition, Stuttgart).
- [19] Böhme G. *Atmosphäre, Essays zur neuen Ästhetik*, 2019, Vol. 4 (Suhrkamp, Berlin), see: Böhme G. *The Aesthetics of Atmospheres (Ambiances, Atmospheres and Sensory Experiences of Spaces*, Thibaud, J-P. (Ed.), 2016 (Routledge).
- [20] Spellmeyer G. *Materialimpulse*. In *Die Sprachen des Materials*, Wolfzien F. and Scholz M. (Ed.), 2016, p. 40, (Reimer, Berlin).
- [21] Meggison D. et al. *Continuing Professional Development*, 2003, (cipid, London).
- [22] Scott H. in: Philpott C. and Scott H. *Initial Teacher Education in Schools – A Guide for Practitioners*, 2014, p. 58 (Sage, London).
- [23] Wachs M.E-. *Design Engineering – sustainable and holistic*, 2022, p. 82 at all (Avedition, Stuttgart).
- [24] Wachs M.-E. and Hall A. *European Driving Range –Innovative Landscapes for A Tangible, Non-Hierarchical Learning Space Within A Material And Immaterial Togetherness* 2019, International Conference on EPDE, Glasgow, September 2019.
- [25] Hall A. 2018, *Introducing Tangible Aesthetics: Contrasting the Introduction of Aesthetic Analysis Tools for Product Designers and Interdisciplinary Design Researchers*, International Conference on EPDE, London, 2018, pp. 482-487.
- [26] Wachs M.-E. *Design Engineering – sustainable and holistic*, 2022, pp. 139 - 154 (avedition, Stuttgart).
- [27] Rossmann R. and Duerden M. D. *Designing Experiences*, p. 177, (Columbia University, N.Y.); *ibid*: see p. fig. 3.1 and 3.2 pp. 40-41.
- [28] Hall A., Bahk Y., Gordon L. and Wright J. *The Elastic Octopus: A Catalogue of Failures for Disrupting Design Education*, 2016, (EPDE Conference, Aalborg).
- [29] Sennett R. *Handwerk*, 2008, p. 63 ff (Berlin); see Sennett, R., *The Craftsman*, (Yale University Press, New Haven).
- [30] Wachs M.-E. *Design Engineering – sustainable and holistic*, 2022, p. 6 and chapter 7 (avedition, Stuttgart).
- [31] Skone J. in: Park J. H. *Didaktik des Designs*, 2016, p. 101 f, (kopaed, München).
- [32] Wachs M.-E. *Design Engineering – sustainable and holistic*, 2022, p. 255 (avedition, Stuttgart).