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EMBODIED DESIGN EXPERIENCES FIRST - BEFORE DESIGNING WITH(IN) AI

Marina-Elena WACHS
Hochschule Niederrhein – University of Applied Sciences, Germany

ABSTRACT
Research on the 'materialising immateriality' design method and the related case studies have proven that hands-on designing with textiles, by humans belonging to different cultures and nations, provides an important tactile impetus and memorable senseful experience. Based on this knowledge, we can generate innovative, resilient textile habits, and develop design didactic approaches for the younger generations, from kindergarten on. In addition, collaborative, cross-generational and cross-cultural design doing provides resilience for the design community in terms of integration. The 'Materialising immateriality' design method with e.g. textile materials was developed over the course of collaborative, cross-cultural space and are showing that embodied experiences are the precondition for hacking digital tools, in designing and generating in virtual reality programs (with textile). Textile is only one example in designing with materials, architecture is another one, where first embodied experience is needed, before twice designing within digital tools, within AI will be senseful - in the meaning of designing resilient. Interdisciplinary materialising immateriality inhouse workshops are building instruments to proof innovative creating ways that we must shape our design tools with AI that will in turn shape us. And that is why hands on designing belongs relevant and as precondition for designing with AI.

Keywords: Embodied experiences, materialising immateriality design method, tactile rebellion and remembrance, material memory, AI body and textile sketching

1 INTRODUCTION
This research study focusses on the topic of 'advanced textiles materials and processes', by experimenting with hands on design and the idea of AI. The design method developed for 'Materialising Immateriality' [1] and the discussion of 'interlinked learning landscapes' [2] in cross-medial, non-hierarchical, interdisciplinary workshops – which first took place in 2019 in Germany and Great Britain – argue the importance of a re-valuation of human experiences with regard to manual designing – in particular that of children, e.g., by drawing in the sand, and adults [3]. At the same time, this holistically sustainable education gives us insight into the significance of good design within a **mixed reality space**, by using textiles. This research paper focusses on three significant didactic approaches to design sustainable textile products and sustainable cycles in the future:
First, the design didactic approach as applied in early education levels, particularly at primary school and before entering academic institutions (from both the children's as well as the educators' perspectives) looking for new textile partnerships in the field of 'Materialising Immateriality', expressed through collaborative hands-on designing – with TEXTILES. Hereby, the pedagogical implementation of tactile trigger points, like textiles, could **promote interlinked learning** and reflection, which would be beneficial to the upcoming textile experts as well a sustainable, circular textile economy, this will be showcased by a case study in cross continental conditions.
Second, it is about the collaborative approach of using different media and different tactile recognisable materials to 'designing experiences' [4] which are memorable. In this manner, corporal senses are a means of combining the design experience with design expertise to create sustainable textile habits – or, if nothing else, textile rebellion and textile remembrance. throughout embodied experiences.
And third, will be touched by looking at new field of cross collaborative experiences, the evolving field of 'interdisciplinarity', in that way Jan Cornelius Schmidt described in the year 2022 [5] that experiencing interdisciplinarity within a new field of research *today*, means generating a new *discipline of tomorrow*.

The ‘Materialising Immateriality design process with textiles’, like chapter two (2) outlines, – underlined by case studies (see fig. 1 – 3) and subsequent workshops – proves that different design methods impact the sustainable outcome not only for design languages, but in the form of pedagogical, economical, ecological and sociological benefits for society. The cultural mind [6] and the material mind [7] go hand in hand, forming a partnership to meet 3-dimensional (textile) media as an important tactile partner for all stakeholders to restore knowledge and rituals. To bridge the gap between reality and immateriality, when using digital design tools and AI, chapter 3 supports the motivation to understand world and complex systems by languages, codes and trigger points underlined by all senses, but in special by tactility. These holistically triggered experiences, embodied experiences, are essential trigger points to act. We need the motivation to act for a sustainable behaviour and sustainable design concepts. Chapter 4 formulates at the one hand a collaborative impetus of human embodied experiences WITH the ‘AI body’– but important is the impact of manmade rebellions with hands on designing and materiality as trigger points. At the other hand, it demonstrates a strong believe, that we have to shape our (human body triggered) AI tools before AI shape us. This so called ‘anti-paper’ fights for behold on crafts technologies and hands on designing as embodied experiences FIRST – before designing with AI.

2 MATERIALISING IMMATERIALITY – THE SIGNFICANCE OF TACTILITY

2.1 ‘Materialising Immateriality’ in context of design methods - TEXTILES as tactile trigger

Let me introduce how important the language of textiles is about the design and embodied learning process: In the year 2009, Matilda McQuaid wrote: ‘Fashioning Felt examines the explosion of interest in recent years in the field as a design material and process. […] Felt’s first wave occurred as part of the fibre-arts movement of the 1970s. In 1979, British artist and scholar Mary Burkett produced an exhibition and book, The Art of the Felt maker (note: ‘The Art of the Felt Maker’), which toured England and introduced to many people the felt making traditions of nomadic peoples. This served as a catalyst for two decades of intensive field research.’ [8]. McQuaid described how textiles triggered the research by Canadian and British textile experts into the felt heritage found in North Africa, Mongolia and Japan. In the year 2019, ten years after McQuaid study, the research by Marina-Elena Wachs about **interdisciplinary industrial designing** with a focus on textile materials, created the framework for the ‘Materialising Immateriality Workshop’ practised with student group at RCA-UK and as well in Germany. This facilitated the collaborative design work of different students coming from a range of study levels, from bachelor and master students to PhD students, all of whom had different previous educational and cultural backgrounds. The textile media were fantastic trigger points that sparked the expression of their respective expertise.

Materialising Immateriality workshops are characterised by the following process: 1. A broader range of different textiles are given to the workshop participants as trigger-point. 2. The analysed functions, material-composition, construction parameters and narrative associations – related to individual experiences and to societies history at all – will than have an impact in the next design steps. 3. Mapping-Methods-Exercises in groups and for the individual design/-concept are than following. 4 Interim-Presentations and final presentation are coaching different didactical relevant results and competences. See the detailed process of ‘Materialising Immateriality Method’ within Wachs book about ‘Design Engineering – sustainable and holistic from 2022 [9]. The academic benefit of learning through hands-on, collaborative designing is the acquisition of knowledge about textile applications and textile technological functions, while simultaneously learning about the textile heritage of different countries. The last element was beneficial for raising awareness about one’s own cultural textile heritage and, at the same time, learning about the **textile languages** and the meaning of the textile codes of other cultures over the course of history.

The design method that we used within the workshop, ‘Materialising Immateriality’, has to be regarded as a design didactic approach for each group – in different languages and for different educational levels – which is communicated and related to the evolutionary development of design methods in Europe as listed below: (listed in a non-chronological order)

- Classical (linear) design process (original form of the term design; sketch based)
- Design driven by technology (first the development of technology – form / design followed)
- Interactive design (abstract term elaborated and used for interactive, collaborative designing)
- Design thinking (mind-map based; reflective theory- and concept-based, collaborative ideating act)

- Integrative design (participants from different disciplines and different cultural backgrounds)
- Materialising immateriality (tactile materials create the process and the design object or a design concept, which is communicated and expressed via textiles within a designed 'form')

In the year 2019, 'materialising immateriality with textile methods' first was developed during intercultural workshops in Germany and Great Britain, within academic circles at universities. The use of different textile materials in various qualities provided important tactile triggers for creating a new process: using the textiles as an impetus for obtaining new perspectives by means of a manual act.

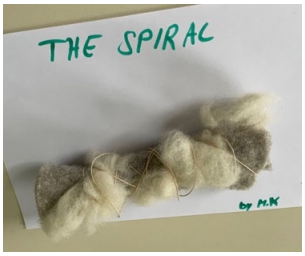

Figure 1. PhD Student is materialising the immateriality of 'illness dementia and the design concept of each individual involved in the care of the dementia patient'. 2019, London

Figure 2. Master student M.L., of course: 'Visual Language', designed: 'textile turn', 2023

Figure 3. Bachelor student in study program 'Textile and Clothing Management', course design theory and history, student M.K. the concept: 'spiral of the textile industry', 2023

The freedom to experiment allowed participants to play with textiles in previously unknown associations – e.g., textile production and textile functions, textiles heritage – and in association with tactile experiences from the past; The textile experimentation took place after an introduction and comparison of textile furniture applications from different countries, cultural design heritages. Figure one shows the textile solution of a PhD student with the subject matter of his doctoral thesis about dementia, in the year 2019: By transferring the design concept of each individual involved in the care of the dementia patient, he integrated elements of empathy design, developed AND communicated by the 'textile concept'. Figure two and three shows comparable workshops with master and bachelor students in the year 2023. These covered a variety of topics, as follows. In the course Cultural Visual Language master students created visual textile language(s) that reflected culture. Master student M.L. created a concept based on the topic 'textile's doubts for the textile turn'. This involved doubting and questioning the given structures in the textile and clothing industry – not only to call for more transparency, but an active co-creation of the textile turning point, too. The open spaces and apertures of the draped textile can be individually designed so that everyone can incorporate their perspective and thus reveal more of the structures in the play of light and shadow. The interactive textile model symbolises the initiative to question and help shape the industry for more transparency as we find ourselves at a textile turning point. Two Bachelor students collaborated during the design theory course, which is part of the degree program Textile and Clothing Management and named their concept 'spiral up – the textile industry'. By expressing the hype of the fast fashion and the spiral of overconsumption and overproduction. With this, they intend to break this system, not only raising awareness about the problem, but also incorporating the element of a textile revolution, which should be transferred to other levels in the subsequent change process. All textile solutions were discussed, reflected and evaluated by all workshop participants. This kind of evaluation and self-reflection serve a resilient (didactical beneficial) learning loop in reflecting and guarantees remembrance.

2.2 Textile rebellion and remembrance serve sustainable (textile) design strategies

Through the experimental possibilities, the playful atmosphere and sometimes the designers' and users' naïve views on unknown materials used within the interaction in Materialising Immateriality workshops, we are working with the ability of remembrance – the memory of preconditioned experiences from our own individual past within the framework of our own society (nation). The cultural memory and the material mind (Wachs) are aware of craft techniques, although we are talking about the loss of these knowledge heritages in design doing with textiles, ceramics and other resources. The initiation of the 'homo faber' event in 2022, which took place in Venice, Italy, is only one example of how to re-activate

and remember the value of a great textile past and other crafts – to inform us of the future. Perhaps we need more textile rebellion and textile interactivity through rediscovery [10] and by ensuring the textile education of all people our sense responsibility can be triggered. We must continuously provide answers for sustainable strategies, while also answering the needs of time and human beings. Juliane Kahl, a textile expert and teacher in Germany and at the London College of Fashion, organised the first fashion hackathon in East Africa as part of an academic research project. She argued that this was a 'Responsive Design project, within the wider development context of the global fashion industry, to which a sustainable strategy must respond and addresses local needs.' [11]. In relation to holistic textile design development and education, we would like to underline that sustainable textile strategies have to integrate textile rebellion, responsive design methods and tactile textile trigger points, such as the Materialising Immateriality Method that is beneficial for business applications and educational spaces.

3 CREATING WITH(IN) TACTILE SENSES – HUMAN MADE ACT OF REBILLION AND EMBODIED CONNECTION AS ANTI CHARACTER TO AI

3.1 The capacity of curiosity + revolutionary acts as manual experience is key – the significance of 'reference letter(s)'

The capacity of curiosity and preference is an important factor in creating the new or seeing things as new. The unexpected influences the aesthetical and ethical creation and expressions in all times. Nowotny and Sennett explores the idea that innovation has to be seen through the unexpected intertwining of times and conditions of science, technology and societies. As Wachs declared graffiti, found in cities symbolising a 'reference letter' as cultural expressions of time as well as a self-expression of the individual relevant to that moment [12], this process of humans' self-discovery through hands on designing with different materials and through different senses can be seen today as anti-character of AI based (on) designing. This kind of designing could never be replaced by AI but is important for the designers' signature and ideating design power – and capacity.

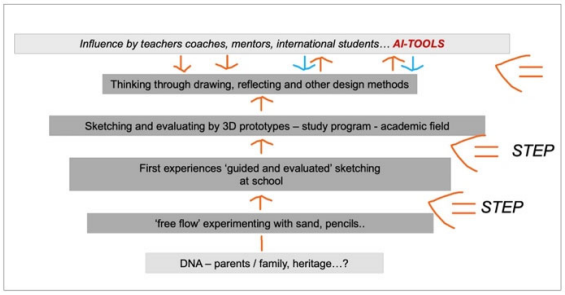

Figure 4. Prerequisites for designing within the futures tools, 2024 thesis-by the author

Doing design by ideating with your hand are the '*Prerequisites'* [13] for creating and interpretating design codes, product languages as symbolically meaningful representatives, the beginning for societies reference letter and heritage, that ideates the new, unknown. The ability of coding with hand begins in free style designing as a child, developing in different steps, more or less influenced by cultural coding (see fig. 4). Today, at the beginning of the post digital era, 'patterns' are crying for attention, to feed the data collection of the AI-designing tools. Yet in the past, the meaning of ornaments was interpreted differently, and was viewed in different artistic, societal and design historical and ethical contexts. Like you have seen, with the help of the new experiences by the workshop 'Materialising Immateriality' the sociological and pedagogical and design didactical perspectives are telling us, manual experiences are key for the design act as well for restoring knowledge, knowledge of crafts, textile techniques or design didactical methods. This great archive of knowledge lay in all cultural by hands created and by hands evaluated design values and will have influence for the next design output of AI based designing [14].

3.2 Textiles as trigger point for 'embodied social knowledge'

The experiences gained by the revolutionary act of designing is transferable to designing with textiles as a revolutionary and memorable 'all in' act. 'All in' means experiencing the individual acts with all senses – not only with the eyes and controller within the reduced frame of VR spaces, but also with acoustical and tactile approaches, smelling and tasting if possible, aligned with feelings and emotions. If you look at the process of 'Materialising Immateriality with textiles' (2019-2023) we have to reach a

culturally understandable interpretation of sustainable textile usage, to facilitate resilient habits for societies around the world. The act of creating together generates communities of its own: If we describe the revolutionary act as and 'all in' act, with all senses and a high motivation to act, the sociologist Richard Sennett explains as follows: 'In sum, the process of making and repairing inside a workshop connect to social life outside it. The pregnant world embodied helps make those connections. "Embodied social knowledge" is usually used, in the jargon of the social sciences, as a floating metaphor, though metaphors and analogies of course enable understanding […]' [15]. Repairing, the act of doing with textiles, enables one to understand the world, to generate a sustainable world. But working with 3-d materiality is not only to design, to create, to gestalt, to know [16]. It is remembering by hands-on designing, using your material mind [17] in relation to the (textile) heritage and the knowledge archive of the societies - in line with the design methods, and co-creation in special [18]. Sennett argues again: 'Repair work suggests other ways to relate the physical and the social. Restoration, whether of a pot or of a ritual, is a recovery in which authenticity is regained, the damage of use and history undone; the restorer becomes a servant of the past.' [19]. Because at the end we have to evaluate the designed product or concept and the question arise: who will evaluate the result of designed goods, even it feed backs to the human's behaviour and habits? However, we see developments in AI collaboration be human beings [20], but it remains in our hands brain coordination and abilities.

4 'MATERIALISING IMMATERIALITY' – A METHOD FOR COLLABORATIVE TEXTILE EDUCATION TO RESTORE & CREATE RESPONSIVE DESIGN

4.1 Embracing *unknown* by designing solutions with(in) AI?

The 'embodied connections' (Sennett) could be the impetus and 'motivation to act' (Pelluchon) and bring about change in terms of sustainable solutions and behaviour: for this process textiles or the 3-dimensional material, could be considered to be the tactile driver, for coming into action for the change. The textile design solution must be interpreted not only according to its ornamental beauty and the design codes employed, but also as cultural expressions with design didactical and art pedagogical significance. This allows us to learn from each other, cross cultural, cross continental, cross generational. At the same time, the significance of freely creating spaces with tactile materials, by 'Materialising Immateriality-Method' – which involves *textile sketching* that span cultures and generations – is providing a design theoretical and socially resilient and revived act of design doing that is good and reflected. The 3D-material, in this case textiles, promotes 'bridging the gap' [21] between the medium, which act, the actor of designing as co-designer: whether as human being or as AI based robot in optimised functionality. It promotes integration, and forms of integrative design [22] because it is embracing cultural codes and 'embracing the unknown' (Nowotny), which are viewed as 'differences' or 'otherness' in society. It is about understanding the otherness and the unknown, the unexpected. In the year 2020, Ashley Hall sees the 'Designs central value is dealing with the unknown and often the unknowable' [23] within the context of teaching Design AI. The human factor in designing good is precondition in designing resilient, meaningful, and this brings us to the Six (6) Characters in designing the future by human's hand different to AI Characters, that do not full-fill the same:

- Capacity of curiosity and preference as important factor in creating the new
- – as a cultural humanistic resource
- Reference letter – self-expression of the individual relevant to that moment in time.
- Creating a knowledge archive to be used for tomorrow (– not losing the knowledge)
- Revolting moments against societies conventions…emotional act
- With the 'act' in relation to joy and self-discovery.
- Evolving own signature and ideating out-put.

Three-dimensional designing methods hand-made are good to restore textile techniques and textile heritage by remembering the value of design knowledge and hands on designing; evaluating the competences for the individuum and so it is for societies: As seen, textile rebellion and remembrance, by means of hands-on textile designing, is comparable to the act of sketching and designing with tactility, and should enable more sustainable design resilience for the future. Underlined by Nowotny, when talking about the unexpected intertwining of times and the standards of science, technology and societies, we have to 'embrace', or rather withstand this dilemma to create the new and different as something good through (textiles) design as 'natural embodied model' (the author) first, before shaping

(and feeding) our AI tools of the future. These results are underlining: we need embodied experiences first, before designing with(in) AI.

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