
This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.

Aktas, Bilge

Material as the Co-designer

Published in:
The Art of Research VI Conference

Published: 01/01/2017

Document Version
Publisher's PDF, also known as Version of record

Please cite the original version:
Aktas, B. (2017). Material as the Co-designer: exploring a new practice in the nature and at the studio. In The Art of Research VI Conference: Catalyses, Interventions, Transformations

This material is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.

Material as the Co-designer: exploring a new practice in the nature and at the studio

Bilge Merve Aktaş

bilge.aktas@aalto.fi

Aalto University, Finland

Abstract

Creative production is feed upon reflections of the maker from the various phases in the making. This paper presents reflections from an explorative process of studying the material and ways of interacting with it. By introducing examples from different phases of felt making, this study examines how the wool, the only material in felting, reacts as the maker works with it. Coming from a product design background, the author is used to build her works upon facts, needs, or reasons. When she started practising felt, she had no purpose rather than exploring the material and gaining experience on the practice. As the interaction with the material continued, with a carefully documented exploration process, she realised how material reforms itself with the movement of her hands, creating continuous new patterns by recomposing the fibres. This particular example suggests broadening the concept of design by positioning material as the co-designer in the creative process which can propose new ways of understanding the creative practice and material's role. In this paper, the concept of material agency is studied from the perspective of material as the co-designer with a practice-led approach.

KEYWORDS: material agency, practice-led research, wool, felt making, creative practice.

Understanding the Material in Making

Making is a way of materialising thoughts and knowledge. Craft theorist Glenn Adamson (2013: 7) argues that craft has an undefined nature and in essence it is “a way of thinking through practices of all kinds”. Similarly, Peter Dormer (1997: 174), author in contemporary applied art, argues that craft making is also a way of meaning making (ibid.

19). From another viewpoint, contemporary art researcher Howard Risatti (2007: 284) argues that transformations in the material is the essence of craft production. Accordingly, transformations in the material that occur during the craft making process, can provide ways for thinking and meaning creating.

Studying the creative making processes within a theoretical frame can generate new understandings for the practice and theory. Textile artist and researcher Nithikul Nimkulrat (2012: 11) argues that creative practice can be perceived from a theoretical lens if practice and theory share common means. This twofold situation informs the way of designing and reflects the intellectual results of research on the practice (ibid.). From a similar approach, in this paper, I intend to broaden the context of design through studying its elements, namely material, not as additional tools but as significant contributors to creative making. In this study, the concept of design is studied through reflecting on a craft practice, namely felt making, coming from the idea that design and craft are intertwined. Design and craft have common roots and share similar concerns related to personal influences of maker, material interactions while making, and reflective making processes (Aktaş & Mäkelä, 2017).

By presenting explorations with material, in this case with wool, and its contribution to the process of designing and making, the subjectivity of the material, with examples from felt making, is examined. I study material as one of the subjects of the practice rather than a tool for the maker to express herself. Coming from a product design background, holding a bachelor of science degree from Istanbul Technical University, the design education I was given suggests having an idea generation process in the two-dimensional world before actually starting to prototype by hand or tools. After several iterations of testing the prototype, in relation to such as hand size or use areas, the final form is presented. The notion of *form follows function*, from the modernist approach in twentieth century, is still perceived as a significant guidance during the idea generation process.

After starting researching in the field of craft and design, with case studies in felting in Turkey, I started practising felting to gain a deeper understanding of the maker's material interaction and its effects on the practice. Felt is a familiar material but a new practice to me. I started practising felting in March 2017 with an emphasis to making process, documented by recording voice or video during the making and holding a working diary after the practice, not to break the flow of making. During the exploration of the practice, material's role in making have become visible: a dialogue between the movement of my

hands and the response of the material is generated and it is generated differently in each practice. I study this self-exploration from the material perspective, presenting how the material gains a voice and almost becomes the co-designer in the creative making, in a sense suggesting that *form also follows material*, and design, material, function, or technique are not separate entities in creative making. Accordingly, in this paper the superiority of the designer in making is challenged by positioning material as another decision maker.

In order to broaden the concept of design and its relation to maker's material interaction, ideas on matter are studied. Over the last decade, the concept of material has been challenged with a post-humanist approach. Scholars have advocated decentralising humans from practices, and having nonhumans, such as the nature, animals, objects, or materials, as equal entities. As one of the pioneers in the field, social theorist Jane Bennett (2010: 5) argues that things have meanings in their own existence and she identifies matter as vibrant and collaborative element in the making. Political theorist Diana Coole and political scientists Samantha Frost (2010) present the change in the definition of matter through time, starting from physics to expanded definition of matter. Their collection of examples includes studies from political theory on distribution of natural resources, gender studies and representation of the body, and bio-ethics and use of natural resources.

From this renewed perspective, as Coole and Frost calls (ibid. 4), matter is perceived as equally significant subject of the practices, life, or situations together with humans. They argue that matter has a voice as it reforms its own existence constantly (ibid. 10). In a sense, material's own interactions with its environment generates reactions from the material and its being responsive creates new ways of interactions.

The idea that matter informs creative methods has been argued to generate new perspectives in artistic production. Art theorist and artist Barbara Bolt (2013: 6) argues that art is a collaborative practice of the human and the material, and it occurs in a way that the matter has an agency in the making. Further, Bolt (2007: 3) argues that although artists start with intentions, art works are co-emerged by the artist's mastery and material based thinking. Similarly, anthropologist Tim Ingold (2010: 10) suggests that the art work is not separate from all the elements that have a relation to it and the artist's role is to follow the agency of the material to reach the form rather than sticking with the preconceived idea. Ingold also argues that following the flow of the material generates

the “intuition in action” (2012: 433) which suggests decisions are made during the making.

Sociologists Nick Fox and Pam Alldred (2017: 88) suggest the term creative-assemblages, arguing that “creativity emerges from complex ecology of relations between things, bodies, ideas, memories, and social formations within an assemblage”. This idea of creative-assemblages includes subjective interpretations of the maker as well as the physical characteristics of the material (ibid. 87).

In this explorative paper, the aforementioned ideas are followed with an inference that makers who follow the material can take advantage of the qualities and develop their preconceived ideas accordingly or generate new ideas in the process of making. To argue on that, examples from making processes are presented. The first aim of this exemplary makings was to become skilful in the practice through following the lead of the material, and the second aim was to examine how material contributes to the process of producing an artefact. Accordingly, the focus of this study is not on the individual’s designing process or the final artefact but on the process of making, generating ideas, and forming the final artefact from the material interaction perspective. Bolt (2004: 5) calls this kind of holistic creative practices as work of art, which includes the object and object related features as well as the pre-making, the process, and the outcome. In this sense, this presentation of the work of art includes material, its nature, the studio, and collaboration with craftspeople and suggests new understanding for the involvement of the material within the practice.

Practitioners and artists have already been studying material directive-ness in their practices to understand how it informs the practice and theoretical understanding of making. For example, textile practitioner and design researcher Tania Splawa-Neyman (2015: 3) states that during her practice where she used leather to make garments for more than seven years, she “developed and attuned ‘listening’ to the material through making”. Through building discussions with three jackets, she co-emerges a material dialogue between past, present, and future of objects in order to generate a balance between human and object needs (ibid. 8).

Ceramic artist Maarit Mäkelä and ceramic artist and researcher Camilla Groth (2017) present Mäkelä’s creative ceramic making process and argue that form giving emerges during the process of creative making and material becomes an agent in the process

(Mäkelä & Groth, 2017). Similar to the idea of creative assemblages, Mäkelä (2016: 10) used walking as a tool for creative thinking in her practice. She argues that creative ideas are emerged from serendipitous and intentional actions, and reflections on these actions creates new works of art. In art historian Katve-Kaisa Kontturi's (2013: 22) studies, the meaning in the matter is researched in order to overcome the stratified status of the art works. Through examining paintings of an artist, she argues that destructing the givens, the obvious implementations of the material, presents the subjectivity of the matter (ibid. 27).

From a similar perspective, as my main motivation to start practising was exploring the practice of felting and its components, I decided to go beyond the given context of felting and discover its connections to the material by myself. As a rooted creative practice, the context of felting is already given through its evolvement in time, such as the ways to use the material and typical design implementations. However, this study starts with the re-discovery of the creation of felting, from the raw material generation phase till realising the design phase.

Going Beyond the Givens

This study presents a practice-led approach where I first practice, and then study the reflections from the practising process. As Maarit Mäkelä and educational scientist Sara Routarinne, (2006) suggest having the role of a practitioner and researcher in the process of researching provides deeper understanding of the field. Accordingly, my explorations allowed me to discover the hidden meanings in the practice of felting. Also, artist and art researcher Shaun McNiff (2008) argues that using creative elements can help understanding the personal reasoning during the making, while creating a subjective and objective understanding since it proposes to look at the practice as a maker and a researcher.

In order to study my own experiences, a working diary with the reflections, experiences, and significant thoughts I had during the making was held. The diary included the ideas and tactile feelings from the making process, which was then studied to understand how material led me during the making. Art theorist Graeme Suvillan (2009: 48-49) argues that practice-led research starts with a purpose that is defined by and also open for continuous reinterpretations. In a similar sense, I started with certain concerns in mind,

such as how the maker communicates with the material, how material changes in each movement, and how the maker should follow the material's instructions.

Accordingly, in this paper, I present three phases of examining the wool that are from felting or collecting the wool processes: the first one is working at the studio alone when I realised that my interaction with the material is actually based on manipulating it. The second phase is when I worked only with wool to understand its reactions to the movements of my hand, and accordingly the ways to communicate with it. Finally, the third phase is when I was led by the material during the working with craftspeople at their studios and produced felted artefacts.

As I present personal experiences, the use of language evolves accordingly, in a way that invites the reader to become part of the process. The non-conventional academic style of language has been used and suggested by social theorist Nicky Gregson (2011: 143), arguing that the conversational tone strengthens the materiality of presenting the personal experiences.

Wool in its Environment and at the Studio

As part of my practice-led research that studies interaction between craft and design with case studies in felt making in Turkey, I have been practising felt to gain a deeper understanding of the material interaction. Since I am a new maker in the field, I started with learning the basics of the practice: felting is based on unifying wool through pressure or knotting with needles. To start with, I decided to mimic the traditional designs and compositions on undyed ivory wool with undyed black wool. First, I scribbled the designs of the carpets that were photographed during a field trip in Turkey, in December, 2016 (Figure 1). While drawing, the details of the traditional designs became more tangible and a visual exploration was provided: traditional designs are based on symmetry in both axis and repetition of motifs that creates closed loops. Then, I decomposed these designs and applied the most typical motifs on felting (Figure 1). This repetitive study helped me gain the tactile experience, analyse the compositions, and realise the material's subjectivity.

During the felting at the studio with the wool treated for felting that was purchased online, the basic instructions was followed: put pressure on the wool by hand. Hands have

three major movements in the making: first is based on creating a cylindrical form with wool and rolling it, second is based on the circular movement of hands on flat wool surface, and third is based on squeezing wool to generate a three-dimensional form. The position and form of wool fibres changes in each movement of the hand and a new composition is created every time. Before the wool is completely felted, the individual wool fibres are still visible, and the maker can follow the changes in their positions. As making continues, wool fibres lose their individual existence and a unified surface is created.

The transformations that occur to the material is meditational since the continuous and unforeseeable reactions of the material offers a living experience unlike the static view of the finalised form. In the process of making, I did not intervene with the form of the pattern that was given with the black wool and did not try to change it. In each movement, black wool changed its form from the one that was initially proposed by me. At the end, although the general form is evocative of the proposal, in detail the form was transformed.

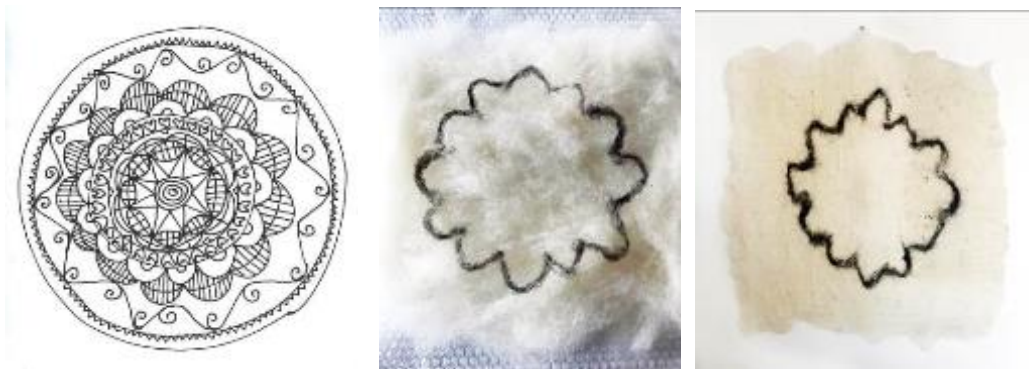


Figure 1: The drawing, one of its parts placed on wool, and after felted. Post-production part was skipped: there was no intervention on the black wool during making and the flow of the material was followed. Photography and drawing: Author, made in May, 2017.

The transformations of the wool provided a basis for building a dialogue with the maker in order to decide on the final form. Realising the material voice was followed by another realisation: I was not only a maker but also a manipulator. Having this idea in mind, I decided to visit the material in its own environment instead of keeping it at the studio. In order to become an inclusive part of the material's world, I went to a rural residential place in eastern Turkey where many of the residents do gardening and small-scale animal

breeding. Sheep and their woolfell at their natural habitat was photographed and video recorded (Figure 2). When still on the sheep, the wool creates its own movements and shapes, influenced by every act of the sheep. The naturally occurred forms are unique and proposes infinite numbers of compositions as they happen by chance.



Figure 2: The sheep while eating. Their wool has not been cut since previous spring. Photography: Author, July, 2017. Turkey.

I also collected the unwanted wool, that is cut from the sheep by the owner. When wool faces with any kind of pressure, high or low, it changes its own form, for example if it is kept in a bag, the wool will be squeezed in the form of the bag (Figure 3). The wool was cleaned and roved with hand operated tools in order to examine its nature (Figure 3, 4). Roving is a way of brushing the wool: the lumps of wool are passed through the metal needles that are located on a flat surface. Then each hand pulls the wool to opposite directions so that wool fibres are lined up.



Figure 3: Wool from different phases: left: wool squeezed in a bag, middle: wool under water, right: wool after being cleaned and hung. Photography: Author, July, 2017. Turkey.

Roving the wool created even a stronger practice to realise the subjectivity of the matter,

as I had to follow the movement of the material in order to rove it. While roving, hands follow the shape of each individual fibre, in a way to put wool pieces in the order that their fibre structures are made to be (Figure 4). In doing this practice, there were times I could rove smoothly and times that I was tagging the wool, forcing it to come out from the needle structure. The more I force the material, the tighter I held the wool, and the worse it got. However, when the lead was assigned to the material, the movement became smoother.



Figure 4: The ancient tool for roving and the wool before (left) and after (right) roving. Photography: Author, July, 2017.

After examining the nature of the wool and learning its most typical movements, I moved back to the studio environment. Two craft studios were visited to work as an intern for four days at each workshop. The first studio works with high quality fine wool, which was washed five times and roved by industrial machines. The practice I was having there was based on laying down small lumps of wool and then creating layers of wool before starting to put pressure with the machine (Figure 5). In this practice, the maker should pick a piece of wool from the large chunk which can be resulted in two ways: if the person pulls it hard the wool does not come out, if the person pulls it gently the wool comes out very easily. I noted to my working diary:

While working, I improved holding, picking, and knowing the wool... The most important (thing) is in order to be able to take the wool comfortably from the hand, you mustn't force the wool to follow your hand's

movement. (Working Diary, 16. August. 2017)



Figure 5: Preparing the wool layers before felting. The small lumps are placed on top of each other. Maker: Şeyma from the studio. Photography: Author, August, 2017.

While working at this studio, I intended to help with all kinds of needs but there were also times I could make my own ideas with wool. During the early discussions, the master craftsperson mentioned about making a piece with the sun pattern several times. As I noted to my diary:

He (the craftsperson) asked me which design to apply. Then, he said let's make a sun, it will be red, a sun-set. And (let's make) a mountain, a tree, a river, he said. So he wanted a landscape picture. We did things like that. But I don't know if he thought of it in that moment... (After finishing) he asked why we didn't make a river. I guess those decisions are made at that moment, based on previous ideas. (Working Diary, 15. August. 2017)

When I asked him if he likes to have landscape designs, he said that he does not have a strong feeling about landscapes. However, his descriptions for new design suggestions are reminders of the children drawings: a sun on the right top corner, a range of mountains, a few trees, and a river. This drawing is likely to be familiar to him as well and whenever he mentioned making a new design he revisited his very early creative making experiences which comes from the paintings he made at the school.



Figure 6: Making of the felt piece with the sun pattern and the final appearance. Background pattern is created by following the movements of the material. Maker: Author. Photography: Author, August, 2017.

After he mentioned making the sun two days in a row, in the third day, I decided to apply the sun as a pattern in my design. I made only the sun, not the whole landscape, because he emphasised the sun and I was just in need of an idea to begin practising for the sake of experiencing the material. Accordingly, the design was not the focus of making but it was just a trigger. In the morning, on the way from my hotel room to the studio, I thought about how to design the composition: I wanted to have only the sun in the centre and I could use all the colours that are in the sun rise and set, since many colour options were available at the studio. When I started making, one decision led to another with the guidance of the material (Figure 6). While making, the wool pieces fell on the surface in their natural shapes, and I decided to have the form of those curves as background pattern in the both sides of the sun. I noted to my working diary:

I don't make decisions first, and then start making. But while making I think about, for example which colours I should use. But these are very short thinking breaks. Very quickly, sometimes while making other things... Now, how much (does) felting (practice) includes intuitively or consciously made decisions? (Working Diary, 16. August. 2017).

In this particular study, I used interactions with the wool as a way of sketching. Coming from a product design background, I am used to develop ideas through sketching with pencils as in the forms of drawings. However, sketching with the material evoked to include the voice of the material in designing the piece and I could benefit from the material features. For example, the idea of having small wool pieces in the background may not have emerged from the sketching on the paper.

When designing and preparing process is completed, the pieces are processed at the machine for several times, each results in fifteen to thirty minutes depending on the thickness of the piece. After the first time at the machine, the wool is still not a compound surface but partially felted where it is still open for re-forming. The flexibility of the material allows maker to make changes in the form (Figure 7). By picking the wool and un-felting it, the form of the piece can be still manipulated. For example, in this case, when the piece with the sun was partially felted, the corners were curved.



Figure 7: Working on the corners. The sharp edgy look is curved by manipulating the flexibility of half-felting wool. Maker: Zekeriya from the studio. Photography: Author, August, 2017.

After spending time at this studio, I moved to another one which was different from the first studio in regards to the type of wool the craftsperson uses, the objects that are made, and the nature of the studio. The second studio has more conventional qualities in all its elements however the technique of making is completely the same. In the first day, I helped the master craftsperson to group the wool that he purchased from the locals living in the surrounding villages: the clean group and ivory pieces, the less clean group, and the group to be thrown away. After grouping, cleaning the wool and roving it with a simple machine begins. The roving machine transforms the wool into fluffy forms in a method similar to manually done roving, so that the wool fibres become more distant from each other. After cleaning the wool and felting, the artefacts are washed. Before the felted pieces are completely dry, the master craftsperson manipulates the pieces: the shape of the piece is not always in the form of the desired one. By pulling the piece from its corners through muscle force, the form of the piece can be manipulated (Figure 8).



Figure 8: The master re-forms the shape of the felted wool, with the help of his stick, after the first iteration of the machine pressure. Maker: İlyas from the studio. Photography: Author, August, 2017.

The experiences from both studies have revealed that in each step of making, wool has a compelling existence, in hidden ways. The final form of the piece is not always the desired one but a result of the negotiations with the material. In a way, the pieces are co-designed by the human-maker and the material-maker.

Designing with the Material

In the three phases presented, I studied different ways of interacting with the material, where each way of interaction has informed the practice from different perspectives. The first phase, the realising the responses of the wool, generated ideas about designing compositions with the wool. The second phase, understanding the nature and movements of the wool, generated ideas about finding the correct technique for collaborating with wool to realise the designs. Finally, the third phase, re-forming the wool pieces after it is partially felted, generated ideas about forming with the elasticity of the wool. From these experiences, creative practices have emerged through the interaction with material.

These experiences exemplify the maker's interaction with the material and the ways to inform the design practice. Material properties is already a significant element in product design: products are designed to be produced and the material affordance is a significant criterion for production. However, material is still not given its position as one of the decision makers in the making, which creates a hidden relationship. During the explorative making process, I experienced how each decision of making, including the ones from the raw material generation process and pattern making, is related to material. This exploration originates a way to make material and design relationship more visible.

Coming from the idea of perceiving material as one of the subjects in the making process, I propose that the material can even become the co-designer in making which can ultimately create a smoother and richer process of creative production.

Nimkulrat (2010: 65) identifies this approach as *materialness*, arguing that material can become an agent in the creation of form, content, context, and time within the craft production. She argues that materialness can express the intentions of the maker (ibid.). Similarly, Splawa-Neyman (2015) discusses the ways in which she co-makes and co-creates with the material in order to generate a future for the used garment. The presented study contributes to this debate on material agency from a design perspective with an aim to broaden the concept of design. In this study, the hierarchy of human over material is challenged through material agency and material is positioned as an equally significant element of creative making by looking at its contribution to making.

However, the subjectivity of the maker is not excluded. Rather, responsiveness of the material is promoted as a significant part of the design; in a sense that the material co-performs the design. Cultural theorist Estelle Barrett (2013: 68) argues that performativity, performing the real action, in creative practices creates an interaction between two forms of subjectivities, artist and the material, which results in an object of knowledge. Accordingly, knowing the performative power of the material, as Bolt (2013: 7) used to describe the role of the material in creative making, can propose using material as the co-designer. Sociologist Richard Sennett (2013 :167) argues that craftspeople who has a constant dialog with their material do not separate thinking from making but create a co-ordination between the mind and the hand. Accordingly, material's performative power does not only propose new understandings for the practice but also for thinking.

From a similar standpoint, I suggest that positioning the material as one of the decisive elements of the creative process can emerge new understandings for the design practice. In this suggestion, starting the practice with a preconceived idea is not challenged but designers are encouraged to be flexible with their ideas on the form by moving from designer-centric way of thinking to designer-material co-centric thinking. Positioning matter as a subject in the making process can build collaboration between designer and material, rather than forcing it to follow their lead.

In this study, I present how the material have informed my explorative creative making process, proposing that material can become the co-designer in the making. By

acknowledging the power of the material, a new understanding for the design practice can emerge: by starting a conversation with the material, intended objects, and herself, the designer can expand the possible ways of making and thinking from a multi-dimensional ecology of design.

References

- Aktaş, B. M. & Mäkelä M. (2017). Craft Dynamics: Empowering Felt Making through Design. *NORDES 7: Design and Power*. 15-17 June, AHO, Oslo.
- Adamson, G. (2013). *Thinking through Craft*, London: Bloomsbury Academic.
- Barrett, E. (2013). Materiality, Affect, and the Aesthetic Image. In Barrett, E. & Bolt, B. Eds. *Carnal Knowledge: Towards a 'New Materialism' through the Arts*. pp. 63-72. London: I.B.Tauris.
- Bennett, J. (2010). *Vibrant matter: a political ecology of things*. London: Duke University.
- Bolt, B. (2004). *Art Beyond Representation: the performative power of the image*. London: I.B.Tauris.
- Bolt, B. (2007). Material Thinking and the Agency of Matter. *Studies in Material Thinking*. 1: 1, pp.1-4.
- Bolt, B. (2013). Introduction: toward a new materialism through the arts. In Barrett, E. & Bolt, B. Eds. *Carnal Knowledge: Towards a 'New Materialism' through the Arts*. pp. 1-14. London: I.B.Tauris.
- Coole, D. & Frost, S. (2010). Introducing the New Materialisms. In Coole, D. & Frost, S. Eds. *New Materialism: Ontology, Agency & Politics*. pp. 1-43. London: Duke University Press.
- Dormer, P. (2010). Textiles and Technology. In: Dormer, P. Ed. *The Culture of Craft: Status and Future*. pp. 168-175. Manchester: Manchester University.
- Fox, N. & Aldred, P. (2017). *Sociology and the New Materialism: Theory, Research, Action*. London: Sage Publication.
- Gregson, N. (2011). Performativity, Corporeality and the Politics of Ship Disposal. *Journal of Cultural Economy*. 4: 2, pp. 137-156.
- Ingold, T. (2010). Bringing Things to Life: Creative Entanglements in a World of Materials. *National Centre for Research Methods NCRM Working Paper Series 05/10*. 15. University of Manchester.
- Ingold, T. (2012). Toward an Ecology of Materials. *Annual Review of Anthropology*. 41, pp. 427-42.
- Kontturi, K.K. (2013). From double Navel to Particle-sign: Toward the a-signifying work of painting. In Barrett, E. & Bolt, B. Eds. *Carnal Knowledge: Towards a 'New Materialism' through the Arts*. pp. 17-27. London: I.B.Tauris.
- Levine, F., & Heimerl, C. (2008). *Handmade Nation: The Rise of DIY, Art, Craft, and Design*. New York: Princeton Architectural Press.
- McNiff, S. (2008). Art-Based Research. In Eds. Knowles, J. G., & Cole, A. L. *Handbook of the Arts in Qualitative Research: Perspectives, Methodologies, Examples and Issues*. California: SAGE Publications. pp. 29-40.
- Mäkelä, M. (2016). Personal exploration: serendipity and intentionality as altering positions in a creative practice. *FORMakademisk*. 9: 1, pp. 1-12.
- Mäkelä, M. & Groth, C. (2017). In dialogue with the material environment: creativity, materiality and skill. *SAR Conference*. Helsinki, 28-29 April.

- Mäkelä, M. & Routarinne, S. (2006). Connecting Different Practices: An Introduction to the Art of the Research. In Mäkelä, M., & Routarinne, S. Eds. *The Art of Research: Research Practices in Art and Design*. pp.10-39. Helsinki: University of Art and Design Helsinki.
- Nimkulrat, N. (2010). Material inspiration: from practice-led research to craft art education. *Craft Research*. 1:1, pp.63-84.
- Nimkulrat, N. (2012). Hands-on Intellect: Integrating Craft Practice into Design Research. *International Journal of Design*. 6:3, pp.1-14.
- Risatti, H. (2007). *A theory of Craft; Function Aesthetic and Expression*. Chapel Hill: The University of North Carolina.
- Sennett, R. (2013). *Zanaatkar*. İstanbul: Ayrıntı Yayınları. [Craftsman 2008.]
- Splawa-Neyman, T. (2015). Discussion with Three Jackets: Making a Material Ecology. *Nordes 2015: Design Ecologies*. 6. 7-10 June, Konstfack, Stockholm.
- Sullivan, G. (2009). Making Space: The Purpose and Place of Practice-led Research. In Smith H. & Dean, R.T. Eds. *Practice-led Research, Research-led Practice in the Creative Arts*. pp. 41-65. Edinburgh: Edinburgh University Press.