

*Marte S. Gulliksen, Catharine Dishke-Hondzel, Tellervo Härkki
and Pirita Seitamaa-Hakkarainen*

Embodied Making and Design Learning

Special Issue from the Learn X Design-conference DRS/CUMULUS, Chicago 2015

Abstract

This issue of FORMakademisk features selected articles developed from papers presented at the symposium Embodied Making and Design Learning at the DRS/CUMULUS-conference LearnXDesign in Chicago, Illinois, June 28–30, 2015. This special issue was developed as an initiative by the symposium conveners. The symposium was developed by researchers from research groups in Norway, Finland and Canada to explore various aspects of embodied making in relation to design learning. The symposium was a full-day event with four sessions, seven paper presentations, a roundtable discussion, a plenary discussion and a workshop. The symposium received positive feedback, attracting many participants and stimulating engaged discussions throughout the conference. This indicates a growing awareness of the topic of embodied making and design learning. This special issue features five articles that together highlight a variety of approaches and examples of current research endeavours in relation to the theme.

Keywords: embodied making, design learning, DRS/CUMULUS

This issue of *FORMakademisk* features selected articles developed from papers presented at the symposium Embodied Making and Design Learning at the DRS/CUMULUS-conference LearnXDesign in Chicago, Illinois, June 28–30, 2015. This special issue was developed as an initiative by the symposium conveners. The aim of the symposium was to discuss the role of embodied making in design learning. The term ‘embodied’ indicates a perspective on experiences as a unity of cognitive and bodily processes (Rosch, Thompson, & Varela, 1991). Theories on the embodied mind have gained considerable momentum throughout the last decades, supported by knowledge from neuroscience on how the brain processes information (Gulliksen, Groth, Mäkelä, & Seitamaa-Hakkarainen, 2016). Embodied making is, in this context, a term used to describe the processes of making in materials – experiences when making artefacts or engaging in other creative activities with materials (Dunin-Woyseth & Nielsen, 2004; Fauske, 2013; Nilsson, 2013).

One main aim within studies of embodied making is to explore the basic conditions and consequences of being a body in the world, experiencing and learning through working in and with materials. The theme is approached using an interdisciplinary lens encompassing a variety of methods such as video recordings, neuro-scientific methods and stimulated recall.

The symposium was developed by researchers from research groups in Norway, Finland and Canada to explore various aspects of embodied making in relation to design learning. The facilitators of the symposium come from a variety of backgrounds across the humanities and social sciences, in particular, art and design, design education and craft science, educational neuroscience and phenomenology. The participating research groups include: The Embodied Making and Learning research group from Telemark University College (now the University of Southeast Norway); the Handling Mind research consortium from Aalto University and the University of Helsinki, Finland, and the Human Ingenuity Research Group from Western University, Ontario, Canada.

The participants in the symposium were (in order of the programme):

- Marte S. Gulliksen, Professor, Telemark University College, Norway (now University College of Southeast Norway)
- Pirita Seitamaa-Hakkarainen, Professor, University of Helsinki, Finland
- Maarit Mäkelä, Associate Professor, Aalto University, Finland
- Catharine Dishke-Hondzel, PhD, Western University, Canada

- Joel Lopata, PhD, Western University, Canada
- Camilla Groth, Doctoral Candidate, Aalto University, Finland
- Tellervo Härkki, Doctoral Candidate, University of Helsinki, Finland
- Brynjar Olafsson, Doctoral Candidate, Telemark University College, Norway (now University College of Southeast Norway)

The symposium aimed to bring these researchers and research leaders together to discuss both the selected topics of embodied cognition in making and design learning and future possibilities for uniting the human capital of each group within a global, co-owned research project.

The symposium was a full-day event with four sessions, three of which were open to the public. A total of seven papers were presented in addition to one round-table discussion and one plenary discussion, which were open to all participants at the LearnXDesign conference.

	Topic	Responsible	Time frame
	8-9 am: Registration		
	9:00-9:30 Welcome		
	09:30-09:35 Welcome to the symposium	Gulliksen	5m
Session 1: Making, creativity and cognition	09:35-09:50 Creative cognition and embodied making	Gulliksen	15m
	09:50-10:05 Creating the space/conditions for creativity	Lopata	15m
	10:05-10:20 Embodied making and creative practice	Mäkelä	15m
	10:20-10:30 Questions	Gulliksen	10m
	10:30-10:45 Break		
Session 2: Learning and embodied making	10:45-11:00 What neuroscience can tell us about skill learning in craft: The promise of cognitive neuroscience in making	Seitamaa-Hakkarainen	15m
	11:00-11:15 Engaging users in the design of post-secondary teaching and learning spaces	Dishke-Hondzel	15m
	11:15-11:45 Round-table discussion	Gulliksen & facilitators	30m
	11:45-13:30 Lunch		
	13:30-14:30 Keynote ENMESH + Panel debate		
	14:30-14:50 break		
Session 3: The body seen in design practice	14:50-15:10 Design and craft thinking analyzed as a form of embodied cognition	Groth	20m
	15:10-15:30 Approaching embodied experience of materials and materiality	Härkki	20m
	15:30-15:45 Plenary discussion	Gulliksen	15m
	15:45-16:15 Break		
Session 4:	16:15-17:15 Workshop - closed session	Gulliksen & facilitators	65m
	End of day 1		
	18:30 reception		

Figure 1. Graphic presentation of symposium, Sunday June 28, 2015

The symposium received a positive response, with several conference delegates choosing to participate and engage in discussion, indicating a growing awareness of the topic. The discussions continued at the DRS2016 conference in Brighton, June 2016, where representatives from the same group organised an additional theme session: Embodied Making and Learning (<http://drs2016.squarespace.com/additional-themes/>).

This special issue features five articles that together show a variety of approaches and examples of current research endeavours related to the theme. They are based on papers presented at the symposium. Two independent pairs of section editors had the editorial responsibility for this special issue. One pair, Gulliksen and Dishke-Hondzel, edited the articles by Groth, Härkki et al., Seitamaa-

Hakkarainen et al. and Mäkelä. The other pair, Seitamaa-Hakkarainen and Härkki, edited the article by Gulliksen. At no point during the editorial process were the authors of the articles involved in the editorial process of their own article. This system was approved and monitored by the editor-in-chief of *FORMakademisk*, Janne Reitan.

Articles in this Issue

In the first article, Professor **Marte S. Gulliksen** from the University College of Southeast Norway focuses on creative cognition and the neurobiological basis of making with an emphasis on the role of the hippocampus in storing and recollecting declarative episodic memories. Revisiting the previous experience of her own woodcarver, and engaging again in woodcarving, Gulliksen explores the complexities of woodcarving from a neurobiological point of view, giving special attention to perception, thalamic attention, memory and neuroplasticity. Through this exploration, three tentative ideas for developing future interdisciplinary studies emerge. The author argues that such studies could be useful in understanding the role and purpose of woodcarving, as well as other making activities, in today's society.

Associate Professor **Maarit Mäkelä** from Aalto University examines the nature of embodied learning and the environment in Tasmania and New Zealand in her article Personal Exploration: Serendipity and Intentionality as Altering Positions in a Creative Process. Mäkelä explores complex ideas about the nature of embodied making, learning and discovery while reflecting upon the process and outcomes of her daily hikes through forests, beaches and hills as she travels to and from her studio. Over the course of several months, Mäkelä gathers ideas and inspiration from her natural environment and documents how they were then incorporated into her creative practice. Her research and process journals are used as primary sources of data to inform how the acts of walking and collecting served as catalysts for creative idea generation in the practice of her art. The paper demonstrates a means of active engagement in the process of creating while teasing apart how materiality, reflective practice and mental space inform the process of circumambulatory knowing.

Authors **Pirita Seitamaa-Hakkarainen** (Professor, University of Helsinki), **Minna Huotilainen** (Research Professor, Finnish Institute of Occupational Health – Brain and Work Research Centre), **Maarit Mäkelä** (Associate Professor, Aalto University, Finland), **Camilla Groth** (Doctoral Candidate, Aalto University) and **Kai Hakkarainen** (Professor, University of Helsinki) examine the promise of cognitive neuroscience in design studies as part of their project Handling Mind: Embodiment, Creativity and Design. The authors offer a comprehensive literature review, which provides a succinct description of the previous research on design cognition and embodied thinking and learning. Following this, the article explores and describes the relevant cognitive neuroscience methods that can be applied to design research in order to study the effects of designing and skill learning. Drawing on their own programme of research on experimental brain research methodologies, the authors provide a rich description of the benefits and drawbacks of specific neuroscientific methods, including fMRI, EEG, MEG, MRI, PET and NIRS techniques, recognising that to effectively study embodied learning, craft and design, the body must often be able to move. This article provides a concise overview and analysis of the methods and techniques that can be appropriately used to examine embodied learning in design thinking within the area of cognitive and neuroscientific experimental studies. Specific examples of skill learning with regard to craft and design enhance and expand our understanding of learning and skill acquisition.

Camilla Groth is a doctoral candidate at Aalto University School of Art, Design and Architecture. Her article – Design and Craft Thinking Analyzed as Embodied Cognition – presents three case studies exploring embodied cognition in design and craft practices. The aim of the case studies is to understand how sense-making takes place through the physical manipulation of materials or, put differently, how the process of physically handling materials creates specific cognitive sensations. In the first case, Groth's examination involves ceramic workshops with deafblind makers. As an active participant and guide through the making process, the author documents and reflects on

the manner in which deafblind makers rely on haptic sense-making in order to create and form ceramics. Drawing on lessons learned from this workshop, the second case study explores Groth's personal experience, blindfolded in her studio, throwing clay cylinders on her potter's wheel. This work was video recorded, and subsequent video analysis revealed 'critical incidents', the reciprocal nature of materials and physical experience as well as the emotional impact and discovery in blindfolded ceramic work. The third case study explores how students make choices about material selection and the words they use to describe the associated feeling and sensations. Together, these three cases provide an opportunity to understand how the process of making is informed by complex and diverse physical sensations and emotions that go beyond language. Groth concludes her article by discussing the nature of tactile experience and how the body informs works of the imagination and the ways in which mental images are formed.

In the final article, **Tellervo Härkki** (Doctoral Candidate, University of Helsinki), **Pirita Seitamaa-Hakkarainen** (Professor, University of Helsinki) and **Kai Hakkarainen** (Professor, University of Helsinki) investigate students' relationship with materials and materiality, focusing on the embodied experience of various materials over the course of a collaborative design assignment. The authors are interested in a better understanding of making and materiality from two standpoints: the nature of the knowledge shared during the process of designing and the knowledge shared between students during the process of making. Students registered on the course participated in the study as consultants to a local aquarium. The aquarium had requested custom-made accessories to be used by groups of visiting children. Using excerpts from student journals and interviews, as well as qualitative video analysis, the authors describe the various ways in which students made decisions about the design and making process of creating the accessories. The authors conclude that students' experiences of design and creation are communicated in many ways, including in the forms of speech and gestures. This article expands our understanding of communication in making and design and reinforces the complex ways in which making and materiality are embodied.

Together, these five distinct articles demonstrate a variety of ways in which embodiment occurs in making and design education and highlight diverse perspectives in the field of design education research.

Notodden, London (Ontario), Helsinki, June 2016

<i>Marte S. Gulliksen</i>	<i>Catharine Dishke- Hondzel</i>	<i>Pirita Seitamaa-Hakkarainen</i>	<i>Tellervo Härkki</i>
Section Editor	Special Issue Editor	Special Issue Editor	Special Issue Editor

Marte S. Gulliksen

Professor, PhD
 University College of Southeast Norway, Faculty of Art, Folk Culture and Teacher Education
 Email address: marte.gulliksen@hit.no

Catharine Dishke Hondzel

Coordinator of Research and Learning Support, PhD
 Huron University College
 Email address: cdishke@uwo.ca

Pirita Seitamaa-Hakkarainen

Professor of Craft Studies, PhD
 Helsinki University
 Email address: pirita.seitamaa-hakkarainen@helsinki.fi

Tellervo Härkki

Doctoral Candidate, MSc, MA in Ed.
 University of Helsinki, Faculty of Behavioral Sciences
 Email address: tellervo.harkki@helsinki.fi

References

- Dunin-Woyseth, H., & Nielsen, L. M. (2004). *Discussing transdisciplinarity: Making professions and the new mode of knowledge production: the Nordic reader 2004*. Oslo: Oslo School of Architecture and Design.
- Fauske, L. B. (2013). Making scholarship: Describing the field of inquiry and the research approach. *Proceedings of the 2nd International Conference for Design Education Researchers* (pp. 508–517), 14–17 May 2013, Oslo, Norway.
- Gulliksen, M. S., Groth, C., Mäkelä, M., & Seitamaa-Hakkarainen, P. (2016, 27–20 June 2016). *Introduction to additional theme session 4 – Embodied making and learning*. Paper presented at the DRS2016, Brighton.
- Nilsson, F. (2013). Knowledge in the making. On production and communication of knowledge in the material practices of architecture. *FORMakademisk*, 6(2), 1–13. Retrieved May 15, 2016 from <https://journals.hioa.no/index.php/formakademisk/article/download/569/659>
- Rosch, E., Thompson, E., & Varela, F. J. (1991). *The embodied mind: Cognitive science and human experience*. Boston, MA: MIT Press.