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Editorial track 6.a

Materiality in the Digital Age¹

In art, design and craft education at different levels, the digital and the material meet, either as integrated wholes, as collaborations or as violent collisions. In such collaborations or collisions, the existence of materiality can be understood differently depending on the viewpoints of art, design and craft educators. Some educators move seemingly effortlessly across digital and physical materiality in their practice (Nimkulrat, Kane, & Walton, 2016). For other educators the concept of materiality exists as something separate from the digital, while others speak of digital materiality as a space where the digital becomes “something” and gains materiality (Bratteteig, 2010).

Dunin-Woyseth and Nilsson (2013) deems the linkages between ‘design research connoisseurs/critics’ and ‘design practice connoisseurs/critics’ vital for understanding practice-related disciplines. In this new orientation towards research, practitioners are also researchers, including educators in theory-led studio practice in universities and colleges. The practitioners not only own the studio but also the research on professional practice and education. Consequently, a new stage in what can be coined the ‘professionalization project’ has been reached, where designers and design educators have come quite

far in establishing their jurisdictional boundaries (Nolin, 2008). The next natural step is to start discussions on a common value base and establish a stronger professional identity.

This track extends its discussion to how the coexistence and collision of the digital and materiality transforms societies and impact people's ways of experiencing things. The educational field is bound to be dealing with value laden questions from several ideological positions (Dewey, 1997). However, avoiding turbulence of questioning different positionings is unhealthy, and bold thinking often emerges from turbulence. We see a need to open the discussion into the topic of materiality in the digital age. It is a start in a discussion regarding how educators from kindergarten and onwards work with, through or even against the digital in relation to materiality, i.e. how digital practices transform the research and education dealing with the topic of materiality.

The aim of this track was to raise questions such as;

- How will we in a world that is so rapidly changing educate for all the ethical and aesthetical aspects, and how do we address the topic of materiality in the digital age?
- How will educators from kindergarten and onwards work with, through or even against the digital in relation to materiality?
- How will digital practices transform the research and education dealing with the topic of materiality and sustainability?
- *How can education address the balance or imbalance of the intangible, of culture, atmosphere, pedagogy and ethics, in the meeting between the digital and materiality?*
- *How can we challenge the dichotomy of digital/material, that can exist symbiotically and in endless ways, and*
- *How can we address ensuing tensions between social innovation and education?*

The ensuing discussions might transform how art, design and craft educators prepare for the meeting between the digital and materiality. Six papers were accepted to the track, and they show a broad approach to this track, with rich discussions in regards to topics.

Peter Haakonsen and **Laila Belinda Fauske** (Oslo Metropolitan University, Norway) authored the first paper *Learning to create images with computer code*. They address the fact that programming is becoming a part of the school curricula in Norway both in lower and upper secondary education in subjects such as art, design and craft. The as questions regarding what programming can to the learning processes of these subjects. The concept of 'Tinkering' is introduced, to describe a creative phase in a learning/working process, emphasising both creation and learning. In the project that they present, visual images are created via computer programming to enhance the main author's learning. The paper discusses tinkering as a learning process that is relevant and motivating in relation to programming within art, design and craft education.

Ingvild Digranes, **Jon Øivind Hoem** and **Arnhild Liene Stenersen** (Western Norway University of Applied Sciences, Norway) has co-authored the paper *Learning about materiality through tinkering with Micro:bits*. This paper discusses two pilot projects in Art and design education at the teacher training at Western Norway University of Applied Sciences. As a point of departure, the pilots try to address the new curriculum of Art and design, where digital knowledge is described as stretching from using simple digital resources to master and shape your own digital products. In general design education the digital is no longer limited to two-dimensional visual modelling as previously practiced. This new approach in a subject where making and materiality is central, tinkering and designing allows for explorations in both 2D and 3D. The pilot case studies demonstrate the importance of bringing coding and the material aspects of tinkering, making, and creating into play in combination.

Francisco Zamorano, **Catalina Cortés**, **Mauricio Herrera**, and **María Elena Errázuriz** (Universidad del Desarrollo, Chile) authored the paper *Designing an intuitive interface to enhance trigonometry learning*. They show how in the last three decades, the application of TUIs (tangible user interfaces) in education has demonstrated its positive influence on performance and learning of students. At Univers-

idad del Desarrollo in Chile, the monitoring of diagnostic tests over time has pinpointed difficulties and challenges in the teaching-learning of trigonometry in first-year Engineering education. This study consists of several steps, designing and validating a tangible interface to learn trigonometry in the classroom setting. Principles of the theory of Embodied Cognition and Blended Interaction is applied to model an intuitive, collaborative and meaningful learning experience. During the design process, three Intermediate Models were tested with several types of users, and two Prototypes were tested with an experimental group. User-testing highly contributed to the design of the interaction experience and the interface, progressively defining the functional and pedagogical aspects.

Delane Ingalls Vanada (University of Florida, United States) authored the paper *Engaging in Materiality: Issues in Art and Design Education*. The paper shows how in the training of art and design educators, modes of engagement that can build capacities for connecting theory to practice through creative research and connections to the physical materiality of art, must not be overlooked. Whether online or on-the-ground learning, artist-teachers must not disconnect from the power of engagement with and the materiality of art. This paper places a focus on ways that teacher training programs can anticipate and activate attitudes of new materialism and design thinking, providing a much-needed anchor in the digital age. With a contemplative view of art practice as research, projects in an art and design education program elevate opportunities for exchanging understanding, promoting dialogue, and approaching learning and research as relationship. Intentionality in the ways that the practice of teaching itself is also materiality, as a living practice, along with the training teachers as designers and facilitators of cultures of making, thinking, and learning are discussed.

Ingvard Bråten (Western Norway University of Applied Sciences, Norway) authored the paper *Experiencing (from) the inside – Mediated perspectives in kindergartens*. His paper presents a case study of preservice kindergarten teachers' use of new form of digital imagery. The paper introduces spherical cameras and digital microscopes and discusses their affordances when introduced in practical use in teacher education and in kindergartens. The use in kindergartens was introduced through a class of 34 teacher students in kindergarten education. The students were specializing in Arts and design at Western Norway University of Applied Sciences. The use of images from spherical cameras and digital microscopes were analysed based on data from student responses through two questionnaires, group presentations and discussions in class, and an analysis of various media material produced by students.

Liv Mildrid Gjernes (Western Norway University of Applied Sciences, Norway) authored the final paper of the track, *Aarup 1960 and the poetics of materials*. It has as its premise that all design has its own conditional modes of expression; however, these are realised through the maker's sense of the possibilities of materiality. The essay takes inspiration from a reclaimed piece of 1960s furniture designed in the modernist idiom, and is based upon autobiographical experiences, original works from own and contemporary aesthetic practices, and associated thoughts in the present. A completely new artistic expression is developed, questioning the strict, use-defined style ideals and letting shape reveal other values and statements than function. The essay succeeds in putting into words how some of the cognitive processes in which creativity, critical reflection and the senses' experience-based insights may bring up something new. It highlights that in creative work, the goal is not to reach a single result; every little discovery made by examining something specific could open up new worlds.

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