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My primary research area is digital artifacts and formative intervention design. Drawing on intervention driven approaches, I am working with Change Laboratory as a comprehensive methodology for comprehending and enhancing learning environments in organizational and educational contexts. Notably, my Ph.D. project was designed around this cultural-historical activity theory approach. Additionally, my research examines how teachers, through formative intervention, define and develop their understanding of digital artifacts and computational thinking in mathematics.

I've always had an interest in working with digital artifacts since I trained as a schoolteacher. After my master I started working as an assistant lecturer at the University College of Northern Denmark. From then on, I explored the potential and challenges of working with digital artifacts in various contexts and teaching experiments in kindergartens, primary schools, and at the bachelor level of social educators. These teaching experiments have evolved and expanded over the years. In 2019, I initiated a Ph.D. project titled *Computational Thinking in Mathematics: A Study of the Educational Staff's Transformative Agency in a Cultural-Historical Activity Theory Perspective*. The project's title encapsulates my research focus. I established and explored connections between organizational and educational contexts and forged links between academic disciplines, such as the humanities and the science, technology, engineering, and mathematical (STEM) fields.

Right now, I participate in several projects related to girls and digital literacy. One study looks at how to get more young girls into STEM-related education. In this study, the intention is to develop didactic knowledge that will be made available through a nationwide MOOC for the benefit of teachers in vocational education and primary schools.

The other project I am a part of is Gender-responsive pedagogy in digital literacy and technology education. Experience shows that girls and boys have different starting points when it comes to digital technology, and there are several gender biases and traditional gender norms associated with the area. As a result of this project, gender-responsive awareness and pedagogical practices will be developed in digital technology education. It is hoped that the project will provide some insights into organizing teaching with digital artifacts that incorporate a gender perspective.

I am also a part of a NordForsk network, which proposes to investigate implementing a play-responsive approach to computational play in Early Childhood Education and Care (ECEC). The notion of play-responsive teaching, pioneered by Nordic researchers, is rooted in Nordic values regarding children's play and how it can be facilitated from a sociocultural perspective. The concept of computational play is a relatively new idea under investigation by Nordic researchers and forms a unique foundation for our project. Combining these two concepts establishes a specific Nordic grounding for our initiative.

With my projects, I have always worked with a practice-based research approach. This gives me good insight into empirical data collection, including ethical considerations in a practice-based research process, and when disseminating and implementing my research to the participating stakeholders. Working with a practice-based research approach to my projects is a clear advantage, and I can see that a direct application of my research will benefit the participants.

One of the things I will investigate in the future is children's understanding of STEM, including STEAM. This is primarily because, in my projects, I can see a connection between the gender perspective and the inclusion of Arts when working with STEM-related activities. I am interested in investigating what makes girls opt out of STEM-related education; something that is connected to my Ph.D. project.

Selected publications

Kaup, C. F., & Brooks, E. (2022). A Cultural-Historical Perspective on How Double Stimulation Triggers Expansive Learning: How teachers and social educators can use double stimulation to implement computational thinking in mathematics. Designs for Learning, 14(1), 151-164. https://doi.org/10.16993/dfl.206

Kaup, C. F. & Møller, A. K. (In press). Science self-efficacy by social educators. Design, Learning, and Innovation - 8th EAI International Conference, DLI 2023, Proceedings. Brooks, E., Sjöberg, J., Møller, A. K. & Edstrand, E. (red.). Springer, (Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering).