



DEN 16. NORDISKE LÆRERUDDANNELSESKONFERENCE

INNOVATION I UNDERVISNING OG LÆRING

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Since the introduction of digital tools in mathematics education more than 35 years ago, extensive research has been conducted in relation to the implementation of different types of software in mathematics classrooms (Drijvers, 2015). Dynamic geometry environments (DGE hereafter) are one type of software that have received ample research attention (for an overview see Højsted, 2020). While many studies have considered students' work in DGE from a cognitive point of view (e.g. Arzarello et al, 2002), design of adequate tasks, as well as the role of the teacher in the mathematics classroom are still understudied areas (Højsted, 2020; Komatsu & Jones, 2018). In this presentation, I will present findings from recent empirical studies focusing on task design (Højsted, 2020; Højsted & Mariotti, 2021a) and on the role of the teacher (Højsted & Mariotti, 2021b; 2021c) in the specific context of implementing DGE activities to support lower secondary school students' development of mathematical reasoning competency. Analysis of these findings show that successful implementation of digital tools is a non-trivial endeavor, requiring carefully designed resources and highly capable teachers. In addition, I will circumscribe the current efforts of a research group (Mariotti et al., 2022) to describe theoretically the complexity involved in the design and implementation of digital resources in mathematics education. Finally, I will consider implications for praxis in primary and secondary school as well as preservice mathematics education.

References



Drijvers, P. (2015) Digital Technology in Mathematics Education: Why It Works (Or Doesn't). In: Cho S. (eds) Selected Regular Lectures from the 12th International Congress on Mathematical Education. Springer, Cham. https://doi.org/10.1007/978-3-319-17187-6_8

Højsted, I. H. (2020). Guidelines for utilizing affordances of dynamic geometry environments to support development of reasoning competency. *Nordic Studies in Mathematics Education*, 25 (2), 71–98.

Højsted, I. H. & Mariotti, M. A. (2021a) Signs emerging from students' work on a designed dependency task in dynamic geometry. In Y. Liljekvist, L. Björklund Boistrup, J. Häggström, L. Mattsson, O. Olande & H. Palmér (Eds.) Sustainable mathematics education in a digitalized world. Proceedings of MADIF12. The twelfth research seminar of the Swedish Society for Research in Mathematics Education, January 14–15 in Växjö (pp. 111-120). Swedish Society for Research in Mathematics Education. http://matematikdidaktik.org/wp-content/uploads/2021/03/MADIF12_dokumentation.pdf

Højsted, I. H. & Mariotti, M. A. (2021b) Guidelines for the teacher – are they possible? [Manuscript submitted for publication]

Højsted, I. H. & Mariotti, M. A. (2021c) Mathematical representation competency in the era of digital representations of mathematical objects. [Manuscript submitted for publication]

Komatsu, K. & Jones, K. (2018). Task Design Principles for Heuristic Refutation in Dynamic Geometry Environments. *International Journal of Science and Mathematics Education*. <https://doi.org/10.1007/s10763-018-9892-0>

Mariotti, M. A., Trgalova, J., Maracci, M. & Højsted, I. H. (2022) Principles for designing digital resources. [Manuscript in preparation]