

PANEL DISCUSSION ON THE INTERPLAY BETWEEN RESEARCH AND TEACHING PRACTICE IN MATHEMATICS EDUCATION

ANNA HOLMLUND, LÓA BJÖRK JÓELSDÓTTIR, MARIA MØLLER,
ALEXANDER JONAS VIKTOR SELLING, AND JÓHANN ÖRN SIGURJÓNSSON

MODERATOR: TOMAS HØJGAARD

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SCHOOL OF EDUCATION, AARHUS UNIVERSITY, DENMARK

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INTRODUCTION AND WARMING UP

- › General thoughts on the relation between research and teaching practice in mathematics education:
 - › A dichotomy?
 - › A fruitful interplay?
 - › Two sides of the same coin?
- › What are the reality, and how should it be?

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Beräkna x om

$$819 = 39 \cdot x$$

$$819/39 = 21$$

Vad är x om

$$a = b \cdot x$$

där a och b är två tal som vi inte vet värdet på?

$$a/b = x$$

Beräkna x om

$$0,657 = 0,045 \cdot x$$

$$?$$

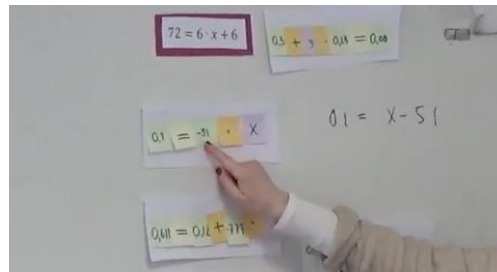
- The conditions for doing research need to reward collaborations with teachers
- More digital research projects in collaboration with teachers are desirable



Anna Holmlund, teacher in mathematics and physics in upper secondary school, PhD-student at CUL - the graduate school in educational studies for teachers

RQ1: How does the nature of numbers influence students' conceptions of equations while solving them?

RQ2: How can we support students to see the structure of equations containing decimal and negative numbers?



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Background

- Grade 1-8 teacher – *music and mathematics* – 10 years (Iceland)
- Preservice teachers educator – mathematics (adjunkt – lektor) 15 years (Denmark)
 - Member of the mathematics research team – 10 years
- Ph.d (defended april 2023)
 - Danish grade 3, 6 and 8 Students adaptivity and flexibility when solving arithmetic problem
- **Thoughts from an early carrier researcher**
 - Research at University College (Danish: Professionshøjskole) – A problem driven research
 - The cultural aspect, both in my research and international research

$$\begin{array}{r} 200 \\ 199 + 328 \\ \hline 2 \\ 200 + 322 \end{array}$$

$$\begin{array}{r} 9040 = 100 \\ 384 + 210 \\ \hline 500 + 100 = 600 \end{array}$$



Lóa Björk Jóelsdóttir,
VIA University College

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Maria Møller

Lecturer, PhD at the University College of Northern Denmark (UCN)



My research focuses on *the didactics of mathematics*, particularly on developing students' *STEM competence*.

STEM has made its way into the education policy agenda, both internationally and nationally
⇒ *How can mathematics education research contribute to fulfilling society's STEM agenda?*

Teacher-researcher collaboration can result in didactic principles for STEM education
⇒ *But how can these principles be implemented in teaching practice?*

What significant value does my research bring to society and practice?

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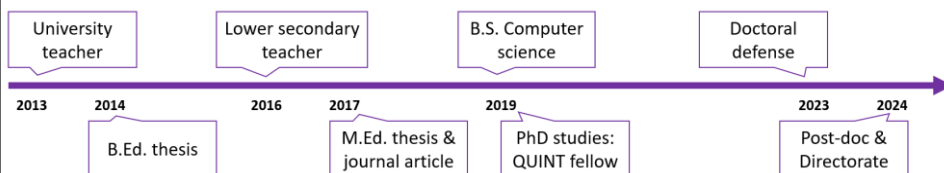
Alexander J. V. Selling – presentation

- Background in teaching and research
 - Master's in teacher education (mathematics and natural sciences)
 - Teacher at upper secondary level
 - PhD in mathematics education focusing on teachers' goal enactment in lower secondary mathematics classrooms
 - Researcher and lecturer in mathematics teacher education
- The relevance of research for practice becomes obscured, or in many cases diminished, as exchanges of ideas between practice and research remain scarce
- A greater focus on collaborations between researchers and teachers, not only for professional development, but research itself, is needed in order to bridge the gap between research and practice

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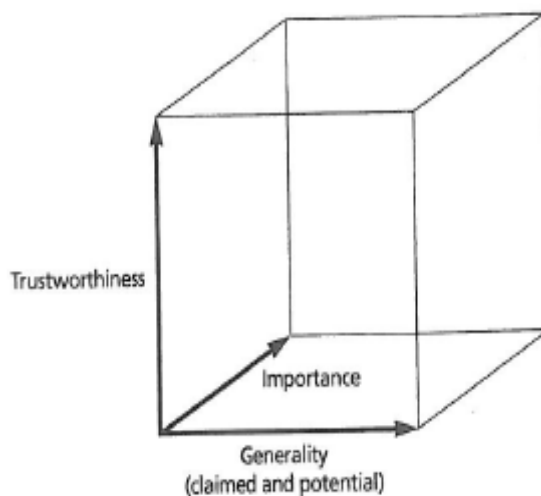
Jóhann Örn Sigurjónsson

- **PhD dissertation topic:** Cognitive activation in mathematics teaching
 - Instructional formats and teacher-student interactions in high-level lessons
- **Relevance:** Do we care about the quality of mathematics teaching – do we care about what mathematics is understood to be?
- **Trustworthiness & generality:** Do we trust coding procedures of established observation systems and peer-review processes – are the findings meaningful outside of the Nordic context?



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PERSPECTIVES ON RESEARCH QUALITY



› *Importance:* Why should one care?

› *Trustworthiness:* Why should one believe what the author says?

› *Generality:* What situations or contexts does the research really apply to?

(Schoenfeld, 2007)

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A REFLECTION MATRIX

Research versus practice	Your own research	Math education research in general
What is the reality?		
How would you like it to be?		

RESEARCH VS. PRACTICE DISCUSSED ALONG EACH OF THE THREE QUALITY DIMENSIONS

How is/should your own research – and how should math education research in general – relate to the research/practice relationship when it comes to the

- › *relevance* of the research? ("Why should one care?")
- › *trustworthiness* of the research? ("Why should one believe what the author says?")
- › *generality* of the research? ("What situations or contexts does the research really apply to?")

What are your thoughts on the research/practice relationship when it comes to the **relevance** of the research?

Research versus practice	Your own research	Math education research in general
What is the reality?		
How would you like it to be?		

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What are your thoughts on the research/practice relationship when it comes to the **trustworthiness** of the research?

Research versus practice	Your own research	Math education research in general
What is the reality?		
How would you like it to be?		

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What are your thoughts on the research/practice relationship when it comes to the **generality** of the research?

Research versus practice	Your own research	Math education research in general
What is the reality?		
How would you like it to be?		