

Democracy and mathematics instruction for adults - three philosophical perspectives

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The project plays with 5 puzzles

How to

1. map **RELATIONS** between adults learning mathematics and democracy?
2. **OPERATIONALIZE THEORETICAL INSIGHTS** from numeracy and mathematics edu. res. to understand the relations?
3. **OPERATIONALIZE THEORETICAL INSIGHTS** from other disciplines to understand the relations?
4. connect the relations to **CURRICULUM PLANNING**: why, what, for whom, how?
5. collect and create ideas for **'CLASSROOM' PRACTICE** according to the relations?

Puzzle 1: How to map democracy and adults learning mathematics?

	FORMAL, REPRESENTATIONAL DEMOCRACY	LIVED, PARTICIPATORY DEMOCRACY
OUT OF SCHOOL		
IN SCHOOL		

Result from puzzle 1: For each of the four boxes

For each box relevant questions can be raised and explored which have the potential to

- ▶ Raise awareness of how adults learning mathematics and adults' numeracy practices can support representational democracy and participatory democracy
- ▶ Describe and develop democratic learning processes in mathematics and numeracy among adults

Result from puzzle 1: All four boxes are relevant in recognising and developing democracy-numeracy relations

	REPRESENTATIONAL, FORMAL DEMOCRACY	PARTICIPATORY, LIVED DEMOCRACY
OUT OF SCHOOL	I.e. counting votes algorithms are decisive. I.e. let voting statistics show actual formal participation	i.e. descriptive and formatting mathematising and arguments about societal phenomena, sell and buy etc
IN SCHOOL	I.e. is access to achieve relevant numeracy/mathematical competence fair?	I.e. democratisation of participation processes in adult 'classrooms' and assessment

Puzzle 2. How to operationalize theoretical insights from numeracy and mathematics education research?

Here are lists of just some of the scholars that can help in exploring relations to democracy.

Danish/Nordic scholar:

- ▶ Mogens Niss
- ▶ Ole Skovsmose
- ▶ Stieg Mellin-Olsen
- ▶ Gunhild Nissen
- ▶ Jens Høyrup (see introduction by Brian Greer in MES 11)
- ▶ Paola Valero

And many more:

- ▶ Keiko Yasukawa
- ▶ Jeff Evans
- ▶ Aguilar & Zavaleta (2012). *On the links A literature review*
- ▶ ...

Result from puzzle 3: How to operationalize theoretical insights from other disciplines to better understand the relations?

Reading Grundtvig, Habermas and Rosa shows that they supplement insights from the home-grown theories and experiences at the former slide. All three can contribute to a deeper understanding of relations between democracy and numeracy.

	REPRESENTATIONAL, FORMAL DEMOCRACY	PARTICIPATORY, LIVED DEMOCRACY
OUT OF SCHOOL	Grundtvig	Grundtvig
IN SCHOOL	Grundtvig	Habermas Rosa

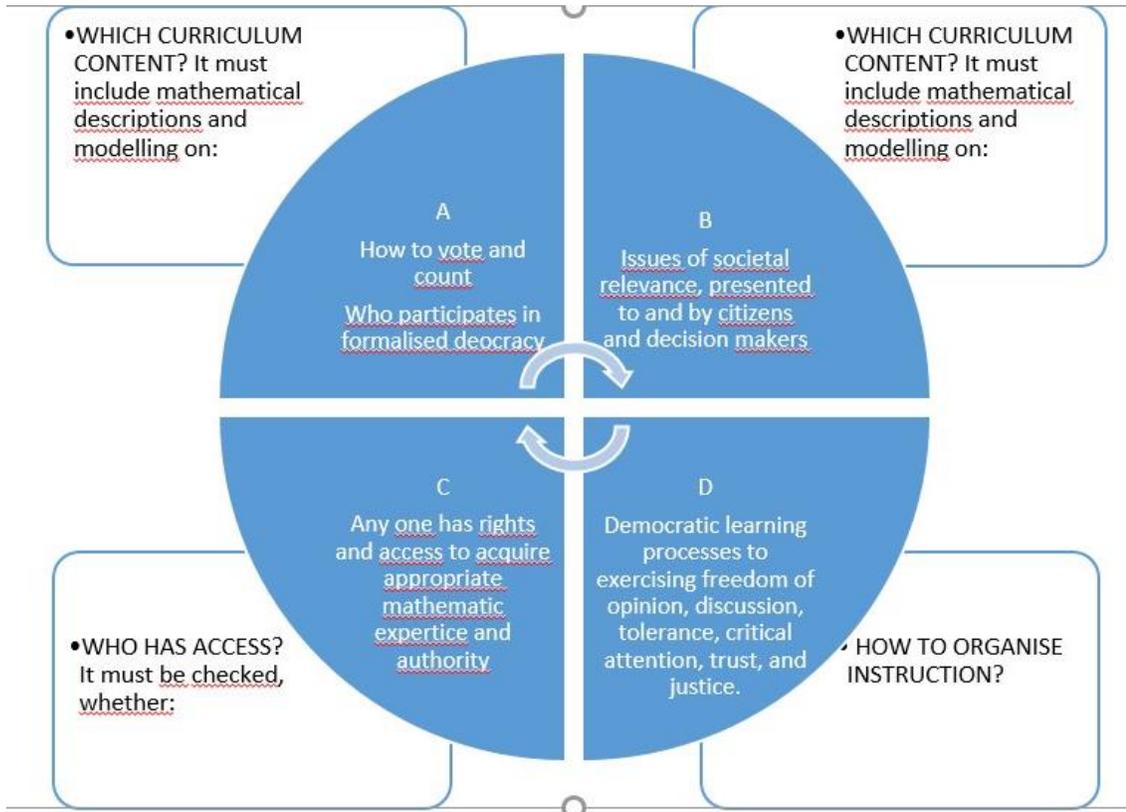
Result from puzzle 3: Theoretical insights from Grundtvig can be operationalised

Grundtvig, Denmark involved in first democratic constitution 1849 said

- ▶ make education accessible for all adults, i.e. adapt school time to adults' work time
- ▶ make school a school for life, to support ordinary people's participation in all spheres
- ▶ look critically of whether mathematics can be for any good of ordinary peoples' lives?

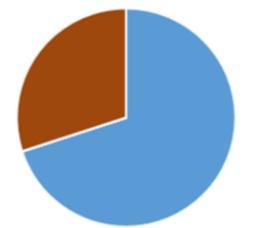
Grundtvig was a Danish scholar. For other countries and regions with democratic structures, movements and experiences, you have prominent scholars with similar perspectives, which it is obvious to refer to.

Result from puzzle 4: The four boxes connect to curriculum planning questions: why, which, for whom, how?



- ▶ All four boxes justifies **WHY** math/numeracy is relevant for adults' understanding, trust and self efficacy in democracy
- ▶ Two boxes above connect to **WHICH** content?
- ▶ Two boxes below connect to **FOR WHOM** and **HOW**

Result from puzzle 5: All four boxes can inspire ‘classroom’ practice

	FORMAL, REPRESENTATIONAL DEMOCRACY	LIVED, PARTICIPATORY DEMOCRACY
OUT OF SCHOOL	<p>Folketing 2019 - ny algoritme</p>  <p>•A •B •C •D •F •I •O •V •Ø •Å</p> <p><small>Figur 2: Partienes mandatsfordeling ved brug af algoritmen 'lertalgsvalg i de ti danske storkredse' © Børne- og Undervisningsministeriet</small></p>	
IN SCHOOL	<p>I.e. explore access today and through history to achieve relevant competence?</p>	<p>I.e. change assessment questions and procedures to support democratic participation in instruction</p>

Hope

It is my hope that the four box model simplifies and illustrates relations between democracy and adults learning mathematics/numeracy.

Much more is to be said on the relations that the model does not capture.

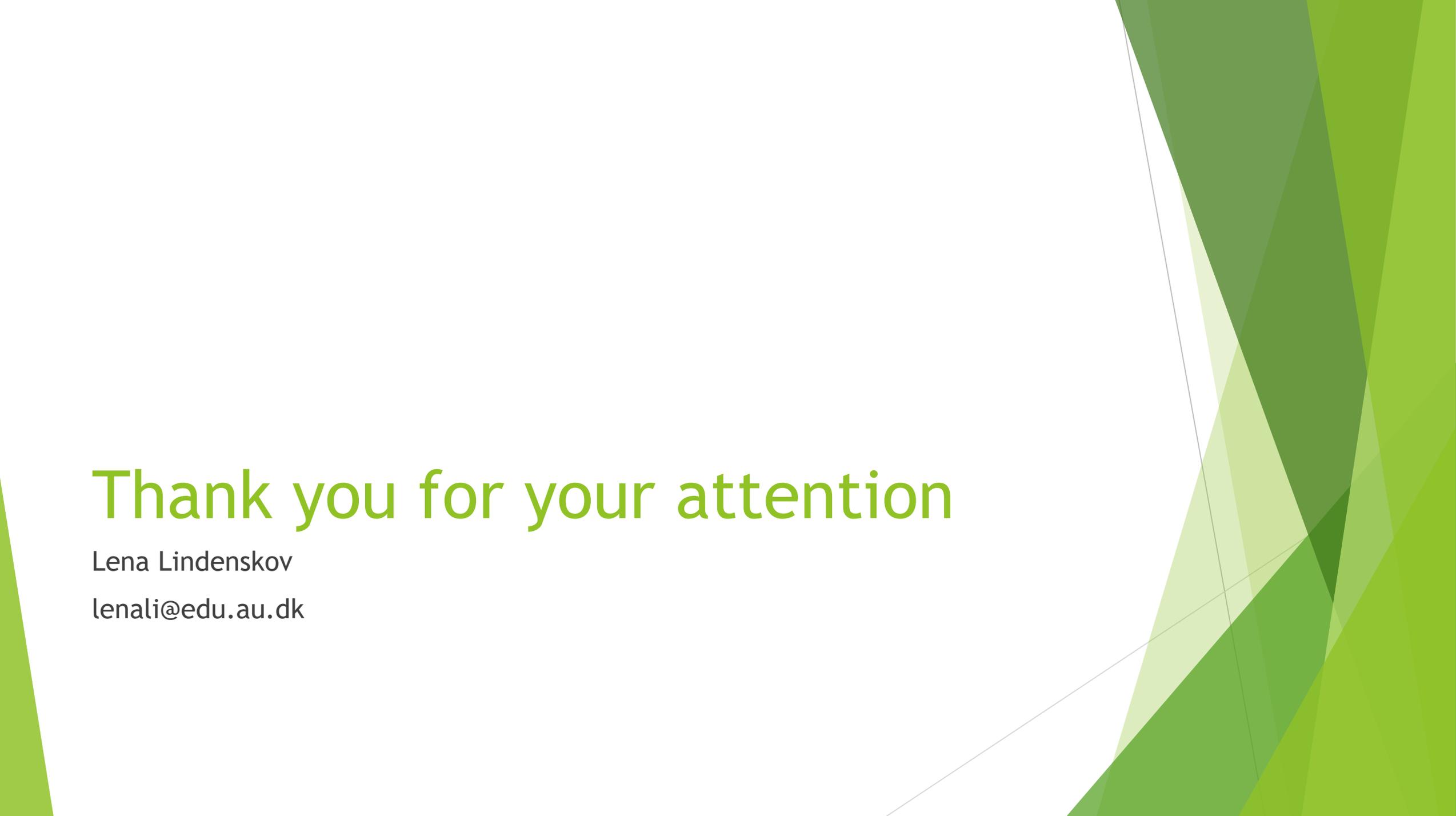
Anyhow, I hope the simple model without losing complexity gives a pragmatic framework to inspire teacher trainers and teachers

- ▶ to raise awareness of how adults learning mathematics and adults' numeracy practices can support representational democracy and participatory democracy



- ▶ describe and develop democratic learning processes in mathematics and numeracy among adults



The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side of the slide, creating a modern, layered effect.

Thank you for your attention

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