ENHANCING MATHEMATICAL LITERACY IN THE FAROE ISLANDS

A DESIGN-BASED APPROACH TO ADDRESSING PISA DEFICIENCIES

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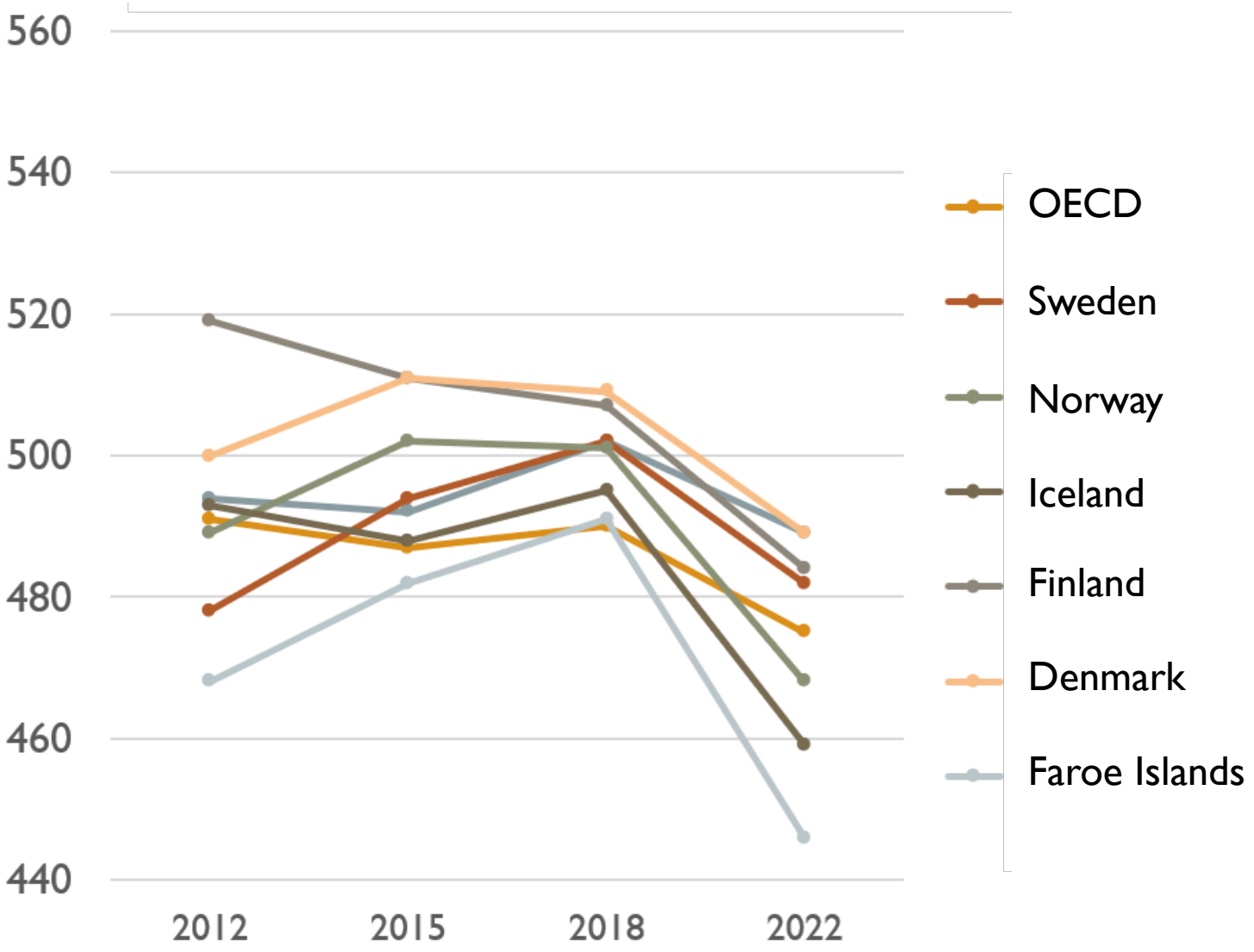
FRÓÐSKAPARSETUR FØROYA


Europe
Kilometers
0 100 200 300 400 500
0 100 200 300
Miles
Iceland
Norwegian Sea
Faroe Islands
White Sea
Barents Sea
Norway
Sweden
Gulf of Bothnia
Finland
Atlantic Ocean
Russia
Estonia
Baltic Sea
Latvia
Lithuania
Russia
Ireland
North Sea
Denmark
United Kingdom
Belarus
Netherlands
Belgium
Germany
Poland
Kazakhstan
Luxembourg
Czech Republic
Ukraine
Slovakia
Bay of Biscay
France
Liechtenstein
Switzerland
Austria
Hungary
Moldova
Caspian Sea

CONTEXT AND RATIONALE

- The Faroe Islands participated in PISA since 2006.
- Performance notably lower than other nordic countries.
- Initiatives including **low stakes tests** in grades 4 and 6, curricular changes, and **more school time**.
- In the following PISA cycles, results improved steadily until 2022.

Average PISA score, Mathematics



- Concerns about the educational system.
- Policy and curricular changes, but has practice changed?
- With support from the Ministry of Education a research group is working to explore:

  How can we bring PISA knowledge about Faroese students into practice?

2024 PROJECT “MATLIT”

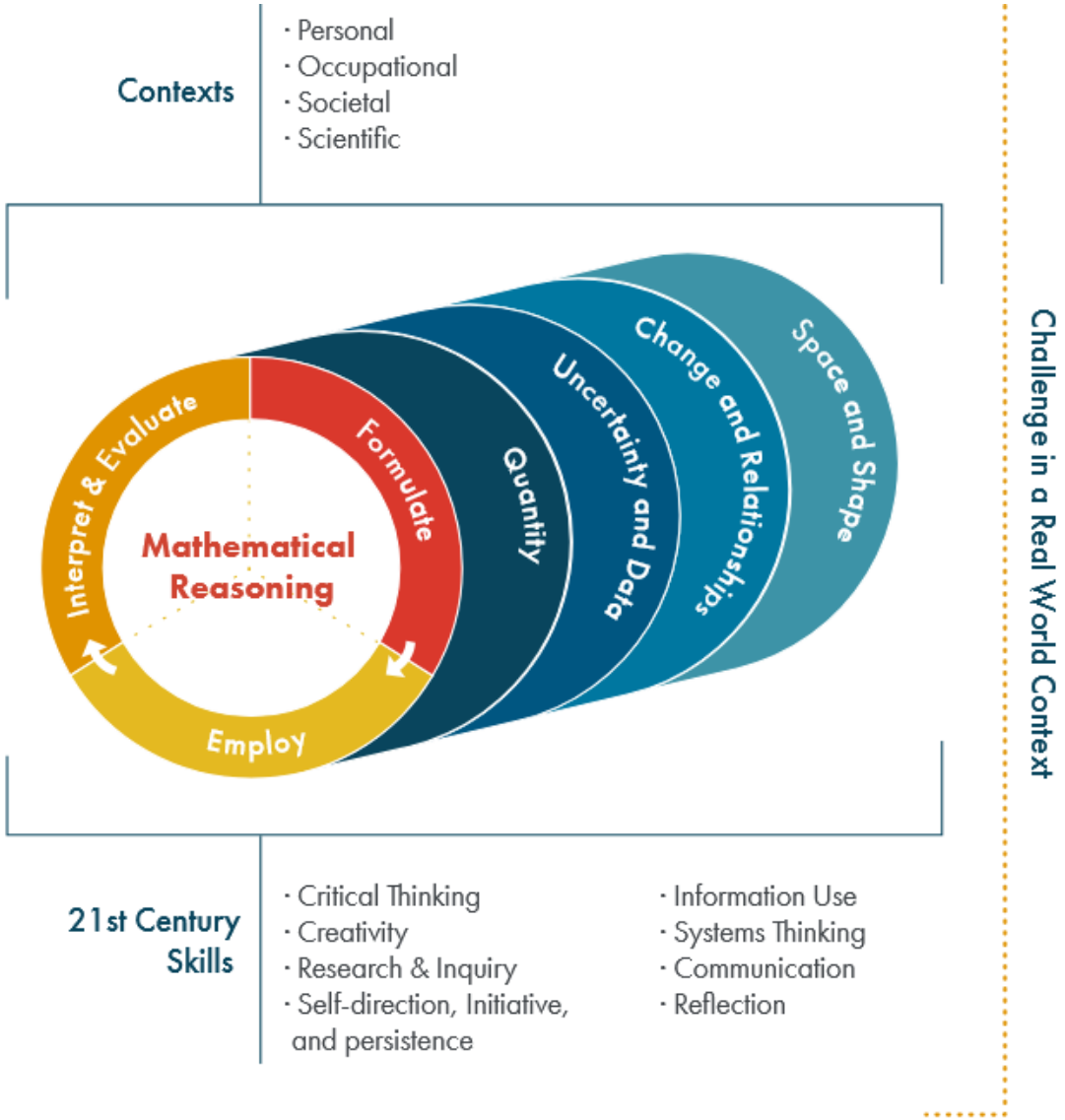
- Small scale design project: Developing faroese **mathematics** school practice

- Initial phase of the project.

APPROACH

- 1. Identifying underdeveloped focus areas of mathematical literacy.
- 2. Design of **educational interventions** (resources etc.).
- 3. Develop teacher teams – communities of practice to support the implementation

IDENTIFYING FOCUS AREAS OF MATHEMATICAL LITERACY



MATHEMATICAL PROCESSES

	Faroe Islands 2022
Employ	441
Formulate	436
Interpret and evaluate	448
Mathematical reasoning	460

MATHEMATICAL PROCESSES

- Most difficulties in modelling processes: Employ, formulate, and interpret evaluate.

	Faroe Islands 2022
Employ	441
Formulate	436
Interpret and evaluate	448
Mathematical reasoning	460

MATHEMATICAL PROCESSES

- Most difficulties in modelling processes: Employ, formulate, and interpret evaluate.
- Slightly better at mathematical reasoning.

	Faroe Islands 2022
Employ	441
Formulate	436
Interpret and evaluate	448
Mathematical reasoning	460

MATHEMATICAL PROCESSES

- Faroese results deviate compared to Denmark and OECD average.

	Faroe Islands 2022	**OECD** 2022	**Denmark** 2022
Employ	441	472	488
Formulate	436	469	485
Interpret and evaluate	448	474	491
Mathematical reasoning	460	473	495

USE OF DIGITAL RESOURCES IN MATHEMATICS LESSONS

Question: How often use [digital resources] in lessons in: [Mathematics]		
	Faroe Islands	Denmark
Never or almost never	40%	3%
In less than half of the lessons	25%	4%
In about half of the lessons	11%	7%
In more than half of the lessons	6%	15%
In every or almost every lesson	17%	70%

PROJECT "MATLIT"

- 1. Design of teaching sequences for grades 7, 8, and 9 (age 13-15) in **three schools.**
  - Focus areas
    - Mathematical modelling - Formulating
    - Computational thinking/Spreadsheet
  - Inspiration from released PISA mathematics items and the PISA Mathematics framework

- Six teaching sequences of three weeks duration.

  Grade 7: Sequence 1a (Fall) og 1b (Spring)

  Grade 8: Sequence 2a (Fall) og 2b (Spring)

  Grade 9: Sequence 3a (Fall) og 3b (Spring)

DESIGN BASED RESEARCH

- Design-based research methodology (Bakker, 2019)
  - (i) Design of educational resources
  - (ii) Testing
  - (iii) Retrospective analysis

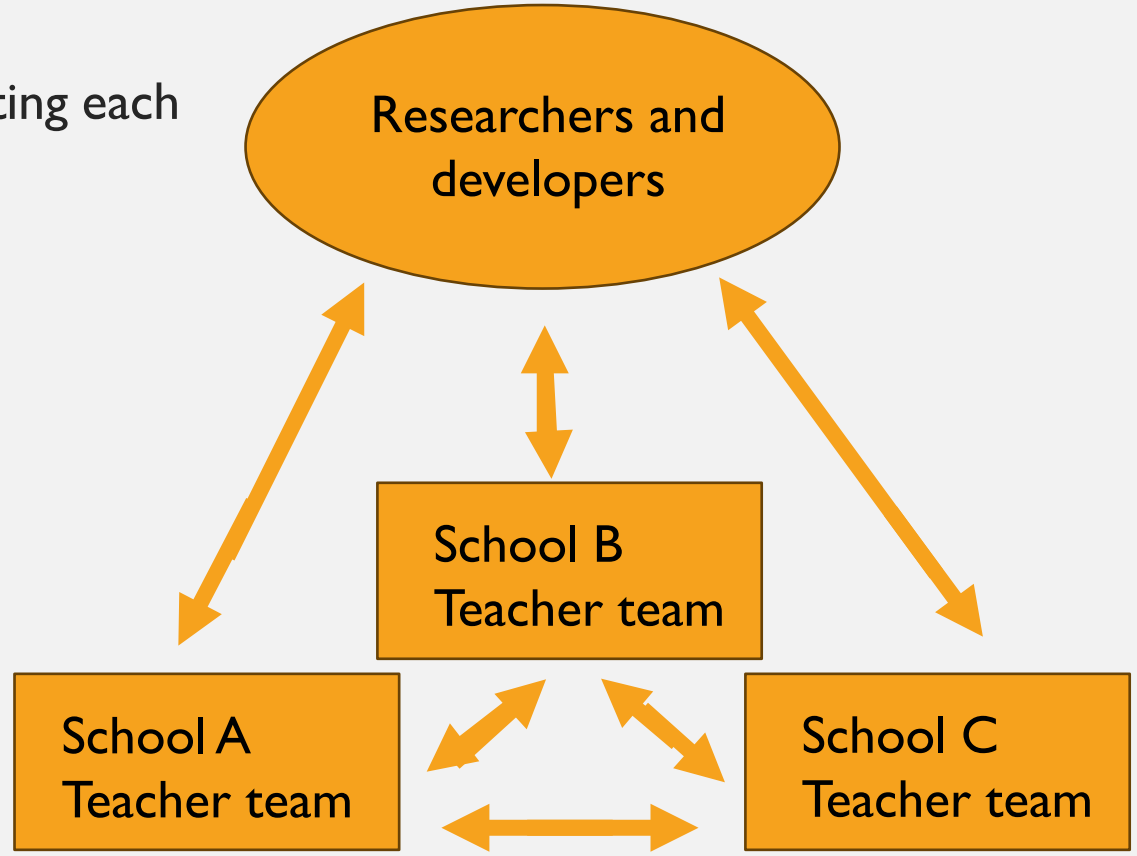
4+ YEAR DESIGN PROJECT

School	2024		2025		2026		2027		2028
	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring
A	Design Teacher team Preparation	1a	1b Seminar – all teams	1a 2a	1b 2b Seminar – all teams	1a 2a 3a	1b 2b 3b Seminar – all teams	1a 2a 3a	1b 2b 3b Evaluation PISA 2029
B og C			Teacher team Preparation Seminar – all teams	1a	1b Seminar – all teams	1a 2a	1b 2b Seminar – all teams	1a 2a 3a	1b 2b 3b Evaluation PISA 2029

2029 – scaling up?

PROJECT "MATLIT"

- 2. Developing teacher teams – communities of practice to support the implementation process.
  - Professional development, support system, evaluating each implementation cycle.
  - Seminars for all teams



MEASURING THE EFFECTIVENES OF THE INTERVENTION

- Evaluating each implementation cycle
- PISA 2029. Entire Faroese student population participates in PISA (approx 700).
- Qualitative measure of the implementation process - Interviews with teacher teams.

SUMMARY AND PERSPECTIVES

- 1. Addressing identified mathematical literacy deficiences through **design and implementation of teaching sequences**.
- 2. Developing teacher teams – communities of practice to support the implementation process.

- Model for similar Faroese interventions in Science and Reading.

- Interested in learning about interventions in other countries

THANK YOU FOR YOUR ATTENTION