



Observatory for
Mathematical
Education

In partnership with



University of
Nottingham

UK | CHINA | MALAYSIA

Longitudinal research of maths education in England – emerging insights around classroom practice and pupil learning

Stephen Lee

Senior Research Fellow

stephen.lee@nottingham.ac.uk

nottingham.ac.uk/observatory

MEI Conference, 2006 July 10 - 12

The University of Reading

**Making the most of New
Structures**

Keynote lecture by Lord Sainsbury

Keynote lectures by David Burghes &
Jane Imrie (NCETM Director/Deputy)

	Tuesday, July 11				
	0915-1030	1100-1215	1330-1445	1515-1630	1630-1730
	Workshop B	Lecture	Workshop C	Seminar 2	Activity sessions
FMN Day	Session 1 <i>Charlie Stripp</i>	Session 2 <i>Charlie Stripp</i>	Session 3 <i>Charlie Stripp</i>	Session 4 <i>Charlie Stripp</i>	Session 5 <i>Charlie Stripp</i>

Session overview

1. Introduction to the Observatory
2. Some insights from the work undertaken so far
3. Exploring the Review of Mathematical Education (RoME) 25 report
4. Outputs and feedback



Questions to ponder during the session

How does the work of the Observatory relate to you/your institution?

What input might you/your institution make into the Observatory's work?

What information/outputs from the Observatory would be of particular value to you/your institution?

1. Introduction to the Observatory



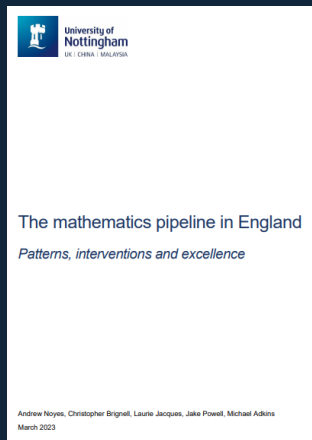
Origins...



Maths education at University of Nottingham goes back to founding of Shell Centre in 1967

Evolved into the Centre for Research in Mathematics Education led by Malcolm Swan

...



Maths pipeline piece of work, completed in early 2023 set off a chain of events, and...by end of 2023 XTX had committed £8m for an initial 5 years to create an Observatory for Mathematical Education (OME), with a second 5 years planned

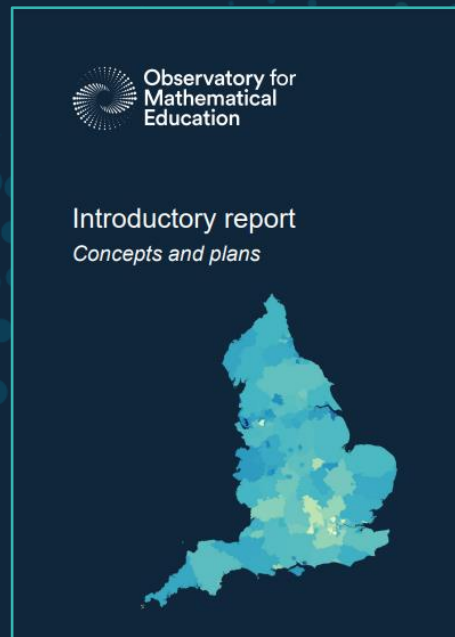
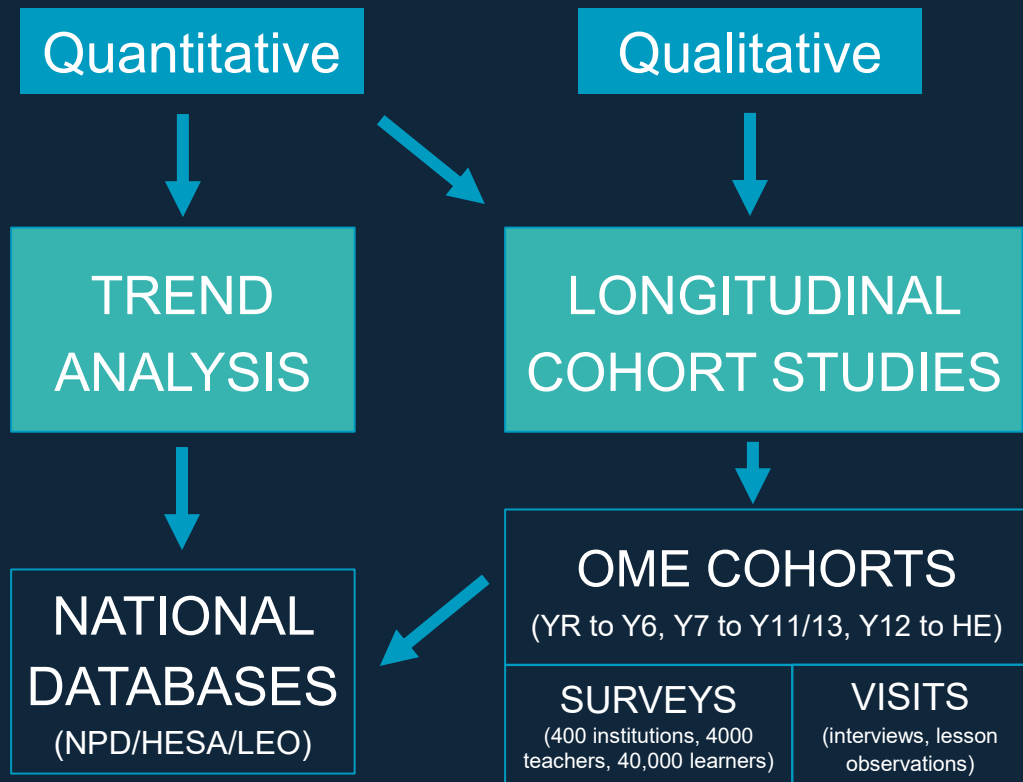
Observatory at a glance

Vision To become the 'go to' place for systems analysis of mathematical education with high policy-relevance, a focus on learners and teachers of mathematics, and concern for mathematics-for-all and mathematical excellence.

Mission To generate and communicate state-of-the-art, evidence-driven, and policy-relevant research to improve mathematical education, learner outcomes and longer-term benefits for individuals and society

Aims **Integrate analyses** of varied aspects of the mathematical education system, to **inform initiatives**, interventions, and practices at multiple scales, and ultimately **improve engagement, progress, attainment, and participation**

Observatory at a glance



TIMSS participation:

131 Primary [Y5 - 4k], 136 Secondary [Y9 - 4.2k]

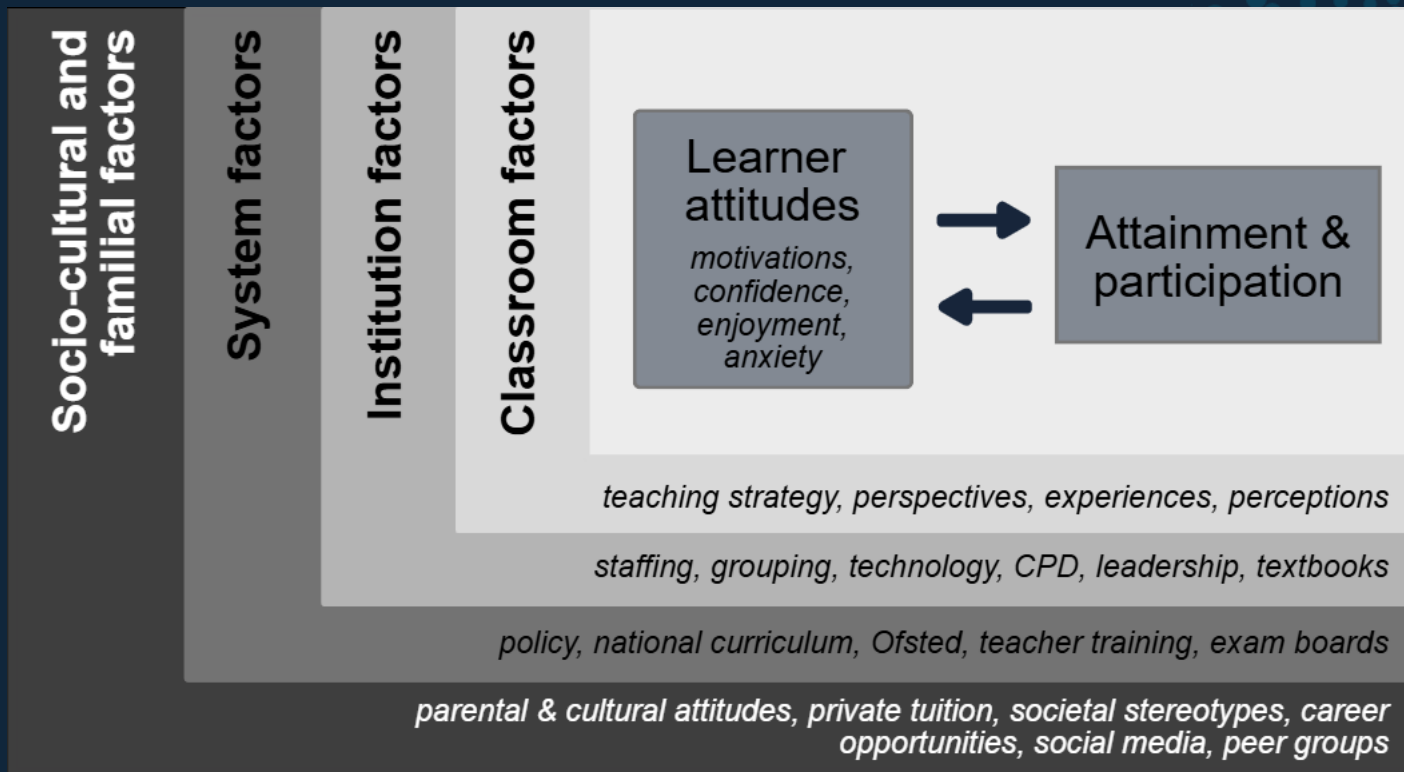
PISA participation:

165 schools [Y11 - 4.7k]

Longitudinal cohort studies (timeline)



Longitudinal cohort studies (research themes)



Activities

Cohort studies

- **Pupil surveys:** on attitudes and experiences
- **Pedagogy surveys:** on mathematics teaching, 'snapshot' lesson
- **Teacher surveys:** on qualifications, experience, work patterns, PD
- **Subject leader surveys:** on policies, curriculum, networks, PD, etc.
- **Parent/guardian surveys:** on their child's mathematics learning
- **Case studies:** observations, interviews with teachers and leaders

Other research and development (often commissioned projects)

2. Insights



Review of Mathematical Education 2025 (RoME 25)

- Many different outputs to date
- Our 'annual report' is RoME
 - This is a 'window' into the work of the Observatory
- Some insights follow (page reference to RoME is given)

20



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Review of Mathematical
Education 2025



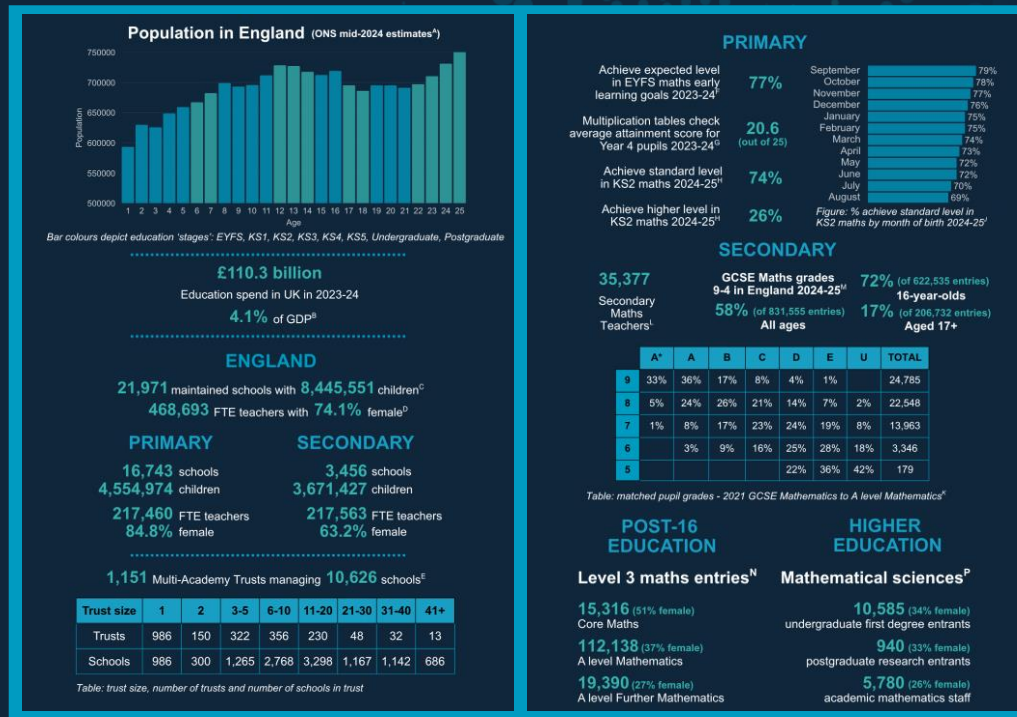
November 2025

Year in review (chapter 2)

21

Selected insights

- National statistics
- National maths statistics
- Big themes of the year
 - Curriculum, budget, challenges, international
- 'Summary' boxes for each sub-section topic



OME Primary Cohort



Primary mathematical education

Selected insights

- Reception pupils generally report positive attitudes to learning maths and these are not patterned by background
- Younger pupils in Reception are less likely to report high confidence and enjoyment
- Reception teaching is based upon a published scheme in 93% of schools with one in ten reporting using a textbook
- Across the primary years, teachers report spending fewer hours teaching mathematics than English in a typical week

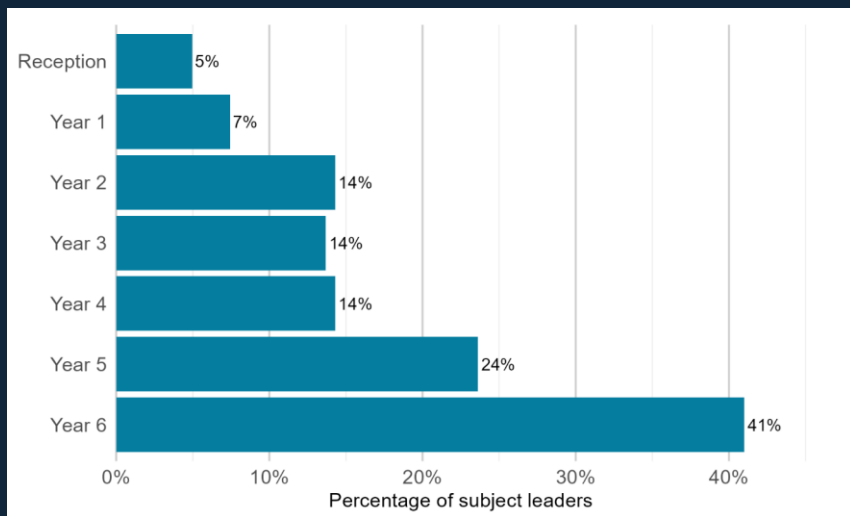


Figure 4.21 The year groups taught by primary mathematics subject leaders.

66

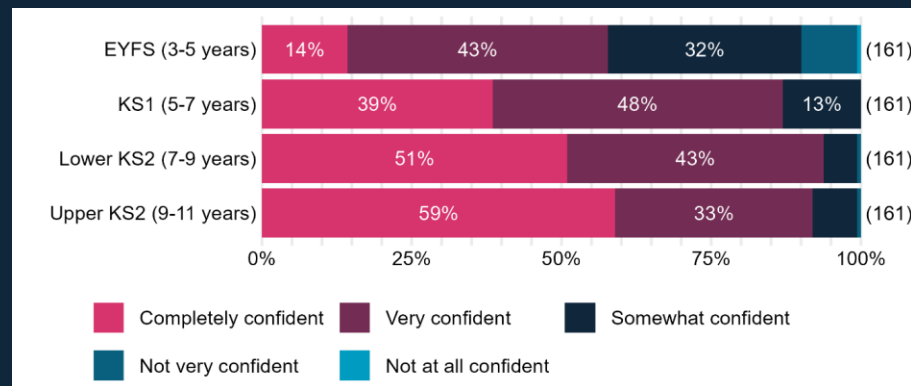


Figure 4.22 Mathematics subject leaders' confidence in their knowledge of how maths is taught in primary school age phases.

OME Secondary Cohort



Secondary mathematical education

Selected insights

- The vast majority of Year 7 students value maths (87%)
- Most Year 7 students report 'high' or 'somewhat high' levels of confidence (70%) and enjoyment (65%)
- Most Year 7 'last' lessons in study focused on number or algebra
- Schools reported using a scheme of work developed by the school (39%) or the MAT (14%)
- Roughly half of teachers reported the job was stressful, but two-fifths disagreed

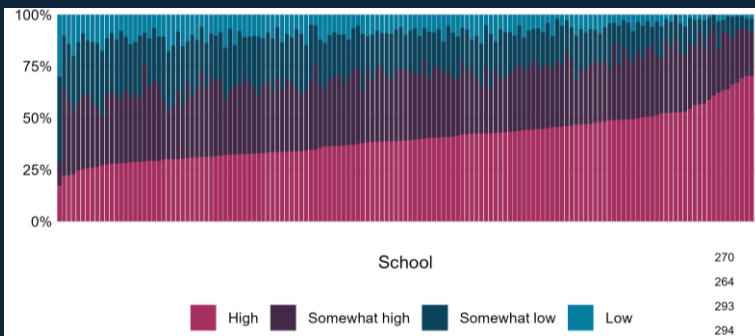


Figure 5.10 Range of confidence measures for pupils in participating secondary schools.

79

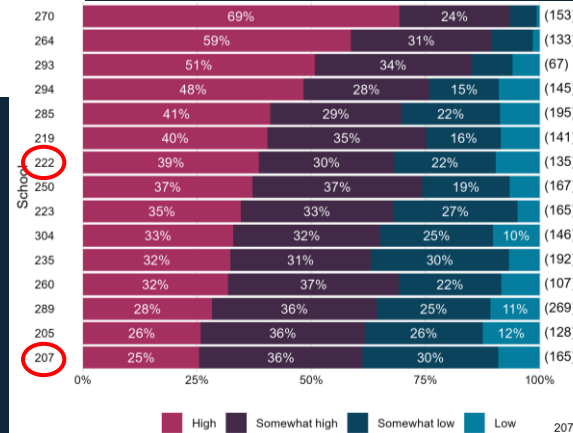
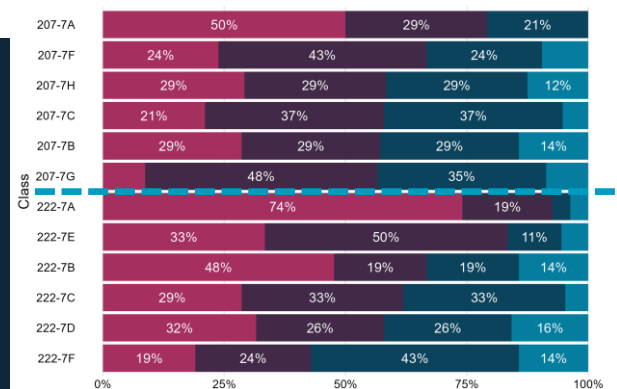


Figure 5.12 Pupils confidence in mathematics, aggregated for each class in 207 and 222.

Figure 5.11 Pupils reported levels of confidence in mathematics in fifteen case study schools.

80



OME Advanced- Higher Cohort



Advanced-higher mathematical education

Selected insights:

- Mathematical confidence varies by prior attainment and gender but is generally high
- *For those progressing to undergraduate mathematics, there is a drop in confidence in semester 1, more so for girls*
- Students in 11-18 schools report different pedagogies than those in sixth form colleges
- Two-thirds of A level Maths students report watching online videos to support their learning; almost half report using online tools to find solutions (e.g. ChatGPT, Wolfram Alpha, Microsoft Maths Solver...)

Figure 6.2 'I am confident in mathematics'

89

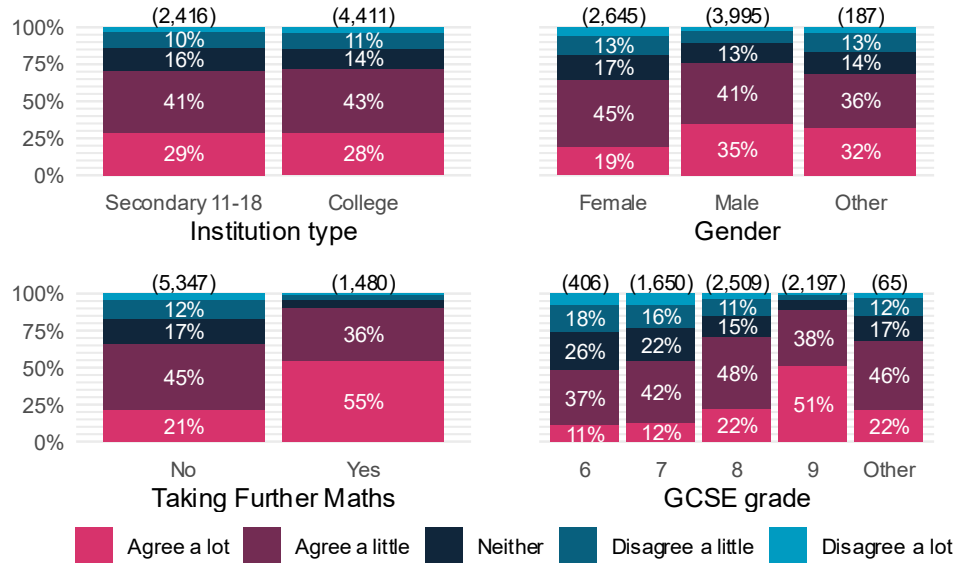


Figure 6.4

90

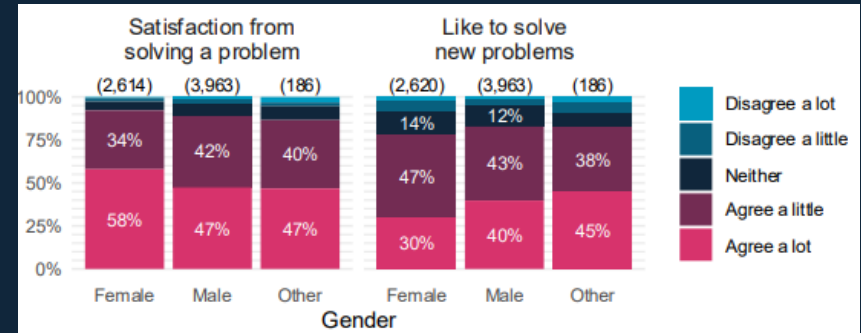
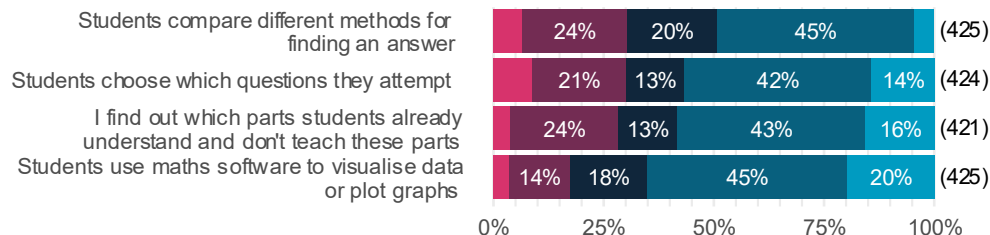




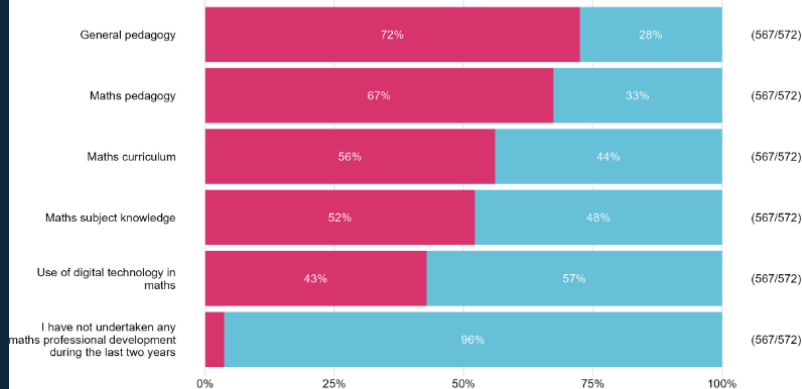
Figure 6.8 Year 12 teachers' practices

93

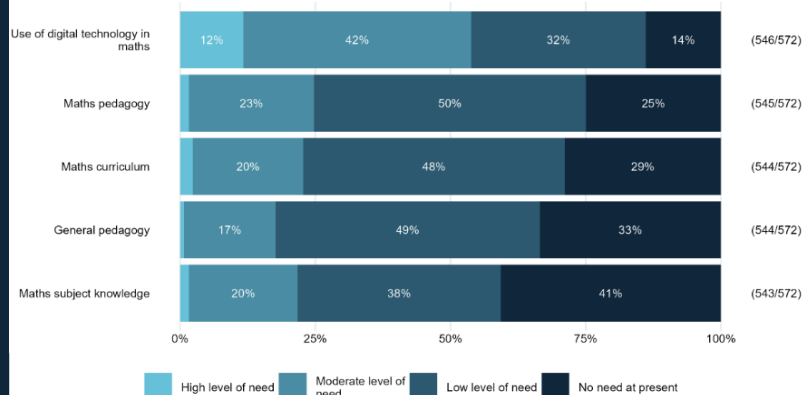


■ In almost all lessons
 ■ In most lessons
 ■ In half of lessons
 ■ In some lessons
 ■ In almost no lessons

Topics included in your maths professional development activities? -



What are your professional development needs: -



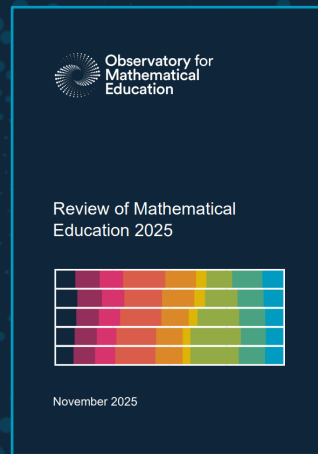
■ High level of need
 ■ Moderate level of need
 ■ Low level of need
 ■ No need at present

3. Exploring the RoME 25 Report



Review of Mathematical Education 2025 (RoME 25) - TASK

- Have a look through RoME 25
- Pick out at least **one example of something that you already knew**, but now have evidence to show
- Pick out at least **one example of something new that you have found interesting**
- In small groups, discuss the examples you've chosen
 - Are they the same, or different?
 - Why did you find it interesting, what's its relevance?



4. Outputs and feedback



Observatory Outputs

- **Thematic reports:** Timely publication of research findings (aimed at policy and professional audiences)
- **Annual report:** Autumn each year, overview of mathematical education
- **Technical reports:** Method etc (aimed at technical audience)
- **Academic outputs:** Working papers, journal articles etc
- **Blogs and LinkedIn posts:** share developments and observations
- **Insights:** *NEW* 1-page key piece of information

Feedback (Questions asked to ponder during the session)

- How does the work of the Observatory relate to you/your institution?
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An event to note:



Research and Practice in Partnership

www.bcme.co.uk/

- 23/24 October, East Midlands Conference Centre
- Release of RoME 26!
- 47 bursaries available – applications by 8 July.



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Thank you

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