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Evaluation of the specialist knowledge for teaching mathematics programme

Submission date 24/11/2025	**Recruitment status** No longer recruiting	[_] Prospectively registered [X] Protocol
Registration date 27/11/2025	**Overall study status** Ongoing	[_] Statistical analysis plan [_] Results
Last Edited 26/11/2025	**Condition category** Other	[_] Individual participant data [X] Record updated in last year

Plain English summary of protocol

Background and study aims

The Specialist Knowledge for Teaching Mathematics (SKTM) programme offers professional development for non-specialist Key Stage 3 maths teachers. It enhances subject knowledge and pedagogical understanding, aligned with teaching for mastery principles and Department for Education's non-statutory Key Stage 3 guidance. Non-specialist maths teachers are those in a state-funded secondary school who have not undertaken Initial Teacher Training in maths. Internationally, non-specialist teachers are often called out of field teachers.

Despite almost half of England's secondary schools using non-specialists to teach maths, there is limited robust research on the impact of professional development programmes on non-specialist teachers' practices. The SKTM programme is developed and delivered by the National Centre for Excellence in the Teaching of Mathematics (NCETM). The NCETM is funded by the government to improve mathematics teaching in England. SKTM is built around the mechanisms of effective professional development and aims to fill this essential evidence gap in an area crucial for practitioners and policymakers. Improving non-specialists' teaching practices is expected to positively impact these pupils, enabling more of them to achieve good grades in GCSE maths.

Who can participate?

To take part, schools must operate in a region supported by a participating Maths Hub and meet the following criteria:

• Be a state-funded mainstream secondary school
• Be operating in a Local Authority supported by a participating Maths Hub OR be willing to join a national cohort of schools where training will be delivered entirely online
• Have a non-specialist teacher, who has not undertaken Initial Teacher Training in mathematics and is teaching a Year 8 class (if the class is shared, the non-specialist teacher needs to teach at least 50% of the lessons)
• Be able to release the non-specialist teacher for all training sessions
• Not be taking part in the Education Endowment Foundation research trials of Peer to Peer Coaching or Making Fluent and Flexible Calculators in the same period.

What does the study involve?
Participating teachers in schools allocated to the intervention group will receive six days of training, spread across the academic year, engaging in 18 topic-based sessions and work collaboratively on maths tasks (within a workbook) to explore subject knowledge, pedagogy, and common misconceptions among pupils. Teachers are also tasked with school-based challenges that encourage them to apply their training in their classrooms.
Control schools continue with business as usual during the study period and are offered access to the SKTM programme in 2026/2027. They receive a £1000 payment for completing all evaluation activities. Intervention schools will receive a £500 payment for completing all evaluation activities.
In June and July 2026, the selected Y8 class in each participating school will complete a maths test (GL Progress Test in Mathematics) which will serve as the primary outcome for this trial. KS2 maths results obtained from the National Pupil Database will be used as a baseline measure. Results will be analysed using multilevel modelling with pupils clustered into schools. An online survey for teachers and another for pupils, both in June/July 2026, will provide data on the secondary outcomes. Other aspects of the implementation and process evaluation undertaken alongside the impact evaluation are: observations of training events, case studies in schools and surveys of maths subject leaders.
The unit of randomisation is schools. The unit of analysis is pupils, clustered into schools. Only one teacher per school can take part in the trial, and if they teacher more than one Y8 maths class in 2025/26, they must select one to take part in the trial.

What are the possible benefits and risks of participating?
Possible benefits include improved confidence and ability in maths teaching among participating teachers and improved maths attainment among pupils.

No meaningful risks are expected from participating.

Where is the study run from?
The evaluators are based at Sheffield Hallam University, England. SKTM is designed by NCETM and delivered by maths hubs across England.

When is the study starting and how long is it expected to run for?
June 2025 to July 2026.

Who is funding the study?
The Education Endowment Foundation, UK.

Who is the main contact?
1. Dr Martin Culliney, M.Culliney@shu.ac.uk
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Contact information

Type(s)
Principal investigator, Public, Scientific

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Study information

Scientific Title
Evaluation of the specialist knowledge for teaching mathematics (secondary non-specialist teachers) programme: a randomised control trial

Acronym
SKTM

Study objectives
The trial will examine the impact of a professional development programme for non-specialist Key Stage 3 teachers of maths that aims to build subject knowledge and pedagogical understanding.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 14/02/2025, Sheffield Hallam University Ethics Committee (City Campus, Sheffield Hallam University, Sheffield, S1 1WB, United Kingdom; -; ethicssupport@shu.ac.uk), ref: ER75429905

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Open (masking not used)

Control
Active

Assignment
Sequential

Purpose

Education intervention

Study type(s)

Health condition(s) or problem(s) studied
Examining the effects of a training programme for non-specialist maths teachers on pupil maths attainment

Interventions
Specialist Knowledge for Teaching Mathematics (SKTM) is a professional development programme for secondary phase non-specialist teachers of mathematics, defined as those who did not do initial teacher training in mathematics. This study uses a three-level multisite cluster randomised trial design with school level randomisation (within each of the cohorts) (two-arm). The SKTM is delivered by Maths Hubs in local cohorts by Cohort Leads, and so randomisation will be stratified by cohort (group of teachers taking part in SKTM under a cohort lead in each area), so that each cohort group is similar in size to those in the usual SKTM delivery if the recruitment target is met. This would give 10-12 schools per cohort, with half allocated to the intervention group receiving the SKTM programme in 2025-26, and the other half to the control group (who will be offered the same programme in 2026-27). Randomisation will be conducted by a member of the evaluation team using Stata ('stratarand' command), with another member of the evaluation team present.

Participating non-specialist maths teachers in schools allocated to the intervention group will receive six days of training, spread across the 2025/26 academic year, engaging in 18 topic-based sessions and work collaboratively on maths tasks (within a workbook) to explore subject knowledge, pedagogy, and common misconceptions among pupils. Training is online or in person depending on school location. Teachers are also tasked with school-based challenges that encourage them to apply their training in their classrooms. These participating teachers will teach maths to the selected Y8 class during the study period (2025/26 academic year).

Control schools continue with business as usual during the study period and are offered access to the SKTM programme in 2026/2027.

Intervention Type
Behavioural

Primary outcome(s)
1. Maths attainment measured using GL Progress Test in Mathematics at June/July 2026

Key secondary outcome(s))
1. Identity as a Teacher of Mathematics (ToMI) (teacher level) measured using the Teacher of Mathematics Identity (ToMI) scale at June/July 2026

2. Pupils' experience of opportunities to think, reason and discuss mathematics (pupil level) measured using Cognitive Activation Scale (CAS) at June/July 2026

3. Mathematics self-efficacy (pupil level) measured using Mathematics Self-Efficacy Scale (MSES) at June/July 2026

Completion date
24/07/2026

Eligibility

Key inclusion criteria
1. Maths teachers at state-funded schools in England who were not formally trained or qualified as maths teachers.
2. Pupils taught by these non-specialist maths teachers who are in Y8 (age 12-13) during the 2025 /26 school year (age limit specified below pertain to pupils).

Healthy volunteers allowed
No

Age group
Child

Lower age limit
12 years

Upper age limit
13 years

Sex
All

Total final enrolment
0

Key exclusion criteria
Selective or private schools (sample size stated below is number of schools).

Date of first enrolment
23/06/2025

Date of final enrolment
03/10/2025

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Sheffield Hallam University
City Campus
Pond Street

Sheffield
England
S1 1WB

Sponsor information

Organisation
Education Endowment Foundation

ROR
https://ror.org/03bhd6288

Funder(s)

Funder type

Funder Name
Education Endowment Foundation

Alternative Name(s)
EducEndowFoundn, Education Endowment Foundation | London, EEF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
	version 1.0				

Protocol file	26/06/2025	25/11/2025	No	No