ACME

Advisory Committee on Mathematics Education

Teachers of maths: supply, training and development

maths Snapshots

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There are not enough specialist teachers of maths in primary, secondary and further education. There is an urgent need to:

- attract more high-quality maths teachers into all sectors
- train all teachers to teach maths more effectively
- support teachers through high-quality, career-long professional learning and provide career opportunities for maths teachers to develop their knowledge and skills
- retain a greater proportion of the best teachers in classrooms.

- **Urgently recruit and retain expert maths teachers in secondary and further education.**
- **Establish specialist teachers of maths in all primary schools.**
- **Provide high quality subject-specific professional development for all teachers of maths.**

Where are we now?

There is a shortage of appropriately qualified teachers of maths.

- Many primary schools have no teachers with specialist training and expertise in secondary teaching maths.
- Secondary schools have a shortage of 5,500 specialist maths teachers in England. (1)
- One quarter of those teaching 11-14 year olds do not have a maths-relevant qualification. (2)
- One in five maths graduates choose to go into teaching (3)
- Across all subjects, almost one in four teachers leaves teaching within five years. (4)

Different routes into teaching contain different quantity and quality of maths-specific training.

- There is no guarantee of high-quality, maths-specific training across Initial Teacher Training (ITT) routes.
- In 2012-13, Ofsted reported that school-based models of primary ITT offered weak mathematical subject training. (5)
- Subject Knowledge Enhancement (SKE) courses provide an essential support for entry into maths secondary teaching for those with limited subject knowledge.

There is no overarching, long-term strategy for career-long professional development.

- There are no guidelines about progression from novice to expert teacher of maths.
- Teachers' access to maths-specific professional development is variable and geographically inequitable.
- There is no system-wide quality assurance of professional development.
- The quality of maths-specific training provided through Teaching Schools is unknown. These schools are judged 'outstanding' by Ofsted but the grading does not require maths training expertise.
- Some highly effective programmes have been discontinued, such as the Primary Mathematics Specialist Teacher (MaST) programme.
- With the aim of coordinating and developing professional development from primary onwards in mathematics the Government in 2014 established over 30 'Maths Hubs'. (See **Maths Snapshot: International comparisons**.)

What are the challenges?

The demand for teachers of maths is growing.

- By 2022, pupil numbers in maintained nursery and primary schools are projected to increase by 15% compared to 2013. (6)
- The new GCSE will require more lessons per week, and increased teacher expertise.
- All students who don't achieve a GCSE grade C in maths or English are now expected to continue with these subjects post-16. As a consequence an estimated extra 600 teachers a year will be needed by 2020 in schools and further education colleges. (7)
  (See **Maths Snapshot: Maths for all to 18**.)
- From 2015 a new post-16 'Core Maths' qualification will be available (an alternative to AS/ A level Maths). Over 2000 more teachers will be required. (8)

Teacher retention rates need to be improved.

- Better retention of teachers can ameliorate the shortage of teachers of maths.
- An improved economic outlook is likely to increase the demand for mathematical skills elsewhere and restrict the flow of good graduates into teaching.

The professional development landscape is changing quickly.

- The new Maths Hubs face a huge task. Each of them will be serving about 600 primary and secondary schools and FE colleges.
- The wide range of independent and commercial providers has led to issues of accessibility and availability of high-quality professional development.

What needs to happen?

1. There is an urgent need to recruit and retain more teachers of maths in secondary and further education.

- An analysis is needed on how routes into teaching and use of incentives have impacted the quantity and quantity of maths teachers.
- A strategy for recruiting teachers of maths to further education is needed.
- Salaries and other incentives, including job satisfaction and professional autonomy, should reflect the growing market for mathematical skills across the economy.
- Better evidence is needed to develop strategies to mitigate teacher attrition.

2. The training of primary teachers of maths requires urgent attention if long-term change in maths education is to be realised.

- Incentives for primary maths specialists need to be further developed.
- A review of the quality and effectiveness of routes into primary teaching is required with a focus on mathematical expertise.

3. The professional development of teachers of maths at all career stages and in all education phases needs to be improved.

- The Maths Hubs scheme needs early evaluation to inform further developments and maximise impact.
- Longer term plans for developing widely-accessible and high-quality professional development are needed, with inspiration taken from other countries.
- All policy developments and initiatives must be underpinned by well-designed professional development opportunities.

1. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268206/DFE-00289-2013.pdf
2. https://www.gov.uk/government/statistics/school-workforce-in-england-november-2013
3. https://www.gov.uk/government/news/quality-maths-graduates-flock-to-teaching
4. http://data.gov.uk/dataset/the-database-of-teacher-records
5. http://www.ofsted.gov.uk/resources/promoting-improvement-initial-teacher-education-ite-primary-mathematics
6. https://www.gov.uk/government/statistics/national-pupil-projections-future-trends-in-pupil-numbers-december-2013
7. https://www.gov.uk/government/publications/teacher-supply-model-a-technical-description
8. http://www.acme-uk.org/media/10520/20121217acme_post_16_strategy.pdf

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