Mathematics Mastery

Key Conclusions

1. This summary is based on findings from two randomised controlled trials conducted in English schools between 2011 and 2014.

2. On average, pupils in schools adopting Mathematics Mastery made a small amount more progress than pupils in schools that did not. The effect detected was statistically significant, which means that it is likely that that improvement was caused by the programme.

3. It is unclear whether the programme had a different impact on pupils eligible for free school meals, or on pupils with higher or lower attainment.

4. Given the low per-pupil cost, Mathematics Mastery may represent a cost-effective change for schools to consider.

5. The evaluations assessed the impact of the programme in its first year of adoption. It would be worthwhile to track the medium and long-term impact of the approach.

What is the impact?

On average, pupils in schools adopting Mathematics Mastery made more progress than similar pupils in schools that did not adopt the programme. The small positive effect can be estimated as equivalent to approximately one month’s additional progress. The effect detected was statistically significant, which means that it is likely that that improvement was caused by the programme.

The programme had a higher impact on pupils in Year 1, who made approximately two additional month’s progress on average, than those in Year 7, who made approximately one additional month’s progress on average.

It is unclear whether the programme had a different impact on pupils eligible for free school meals or on higher or lower attaining pupils than on higher attaining pupils.

In follow-up studies, data from SATs and GCSEs should be used to evaluate the medium and long-term impact of the programme on different groups of pupils.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of pupils (schools)</th>
<th>Effect size (95% confidence intervals)</th>
<th>Estimated months' progress</th>
<th>Evidence strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall impact</td>
<td>10,114 pupils (127 schools)</td>
<td>+0.073 (0.00, +0.14)</td>
<td>+1 month</td>
<td>££££££££</td>
</tr>
<tr>
<td>Primary vs. comparison</td>
<td>4,176 pupils (83 schools)</td>
<td>+0.10 (-0.01, +0.21)</td>
<td>+2 months</td>
<td>££££££££</td>
</tr>
<tr>
<td>Secondary vs. comparison</td>
<td>5,938 pupils (44 schools)</td>
<td>+0.06 (-0.04 to +0.15)</td>
<td>+1 month</td>
<td>££££££££</td>
</tr>
</tbody>
</table>

How secure is the finding?

Overall, the findings related to Mathematics Mastery noted here are judged to be of moderate security. They are based on two large randomised controlled trials conducted in English schools over the period 2011-2013. Findings from both individual studies were judged to have been of moderate security.
The findings from the individual trials have been combined using an approach called “meta-analysis”. Meta-analysis can lead to a more accurate estimate of an intervention’s effect. However, it is also important to note that care is needed in interpreting meta-analysed findings. Due to the ages of pupils who participated in the individual trials, the headline findings noted here are more likely to be predictive of programme’s impact on pupils in primary school than on pupils in secondary school.

The evaluation team are not aware of any other high-quality evaluations of Mathematics Mastery that have been conducted. However, were new evaluations to be published in the future, these should be combined with the two studies noted above to provide a more accurate overall impact estimate.

The findings were substantially lower than the average effects seen in the existing literature on of “mastery approaches”. A possible explanation for this is that many previous studies were conducted in the United States in the 1970s and 80s, so may overstate the possible impact in English schools today. An alternative explanation is that the Mathematics Mastery programme differed from some examples of mastery learning previously studied. For example classes following the Mathematics Mastery approach did not delay starting new topics until a high level of proficiency had been achieved by all students, which was a key feature in a number of many apparently effective programmes.

To view the Primary Maths Mastery evaluation protocol click here.

To view the Secondary Maths Mastery evaluation protocol click here.

How much does it cost?

The average ‘per pupil’ cost of the intervention is estimated to be around £131 per year for primary school pupils and around £50 per year for secondary school pupils, in the first year, with per pupil costs likely to reduce in future years in both cases.