The Durham Shared Maths Project: Challenges encountered during a real large-scale randomised controlled trial

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Overview

- The Durham Shared Maths Project
- Trial methodology
- Challenge 1: Recruitment
- Challenge 2: Assessment in schools
- Challenge 3: Attrition & missing data
- Challenge 4: Interpreting the results
- Conclusions
Durham Shared Maths Project

- Evidence based intervention
- Peer tutoring pedagogy for primary school maths
- Developing resources to support teachers
- Roll-out RCT – training delivered to schools via local coordinators in 4 local authorities
  - Low cost, scalable intervention
  - £8.25 per pupil per year
- Independent evaluator
  - NatCen
  - originally University of Bristol
The trial methodology

- Cluster RCT
- Waitlist control
- 4 local authorities
- 82 schools (40 intervention & 42 control)

- Stratified randomisation – evaluator
- Baseline & outcome assessment – InCAS computerised
Challenge 1: Recruitment

- 4 Local authorities – High level buy-in
- Feedback to improve appeal of trial to schools
  - Waitlist trial design – Phase 1 and Phase 2
  - Timescales altered – originally 2 full years before control group began intervention; altered to 1 year 6 months
- LA’s nominated 22 schools each
- Follow up recruitment events, emails & calls
  - Avoiding differential attrition & resentment bias
  - Balancing selling of intervention with demands and reasons for RCT
- Perceived level of LA support important
- Timescales – drop out over the summer (93 by July – 9 dropped out in September/October)
Challenge 2: Assessment in schools

- Computerised assessment: Blinding Adaptive test

BUT

- Underestimated technology in schools
  - Difficulties led to a school withdrawing
- Amount of time required for all sub-tests
  - Maths, reading, attitudes, developed ability
  - Quickly reduced compulsory assessments
- Lack of communication in schools
- More support necessary than anticipated!
  - LA, local coordinator & phone
- Post-test improved delivery & more prepared
Challenge 3: Minimising attrition (& missing data)

• During the project:
  – Separate newsletters to control and intervention schools
  – Email updates on timeline for the project
  – Local area coordinators contact with intervention & control schools
  – Confirmed contact details for all schools

• At post-test period
  – High level of admin support to chase schools; email, phone
  – Phone support to schools with assessment
  – Visits to each area to train schools on setting up assessments
  – Visits made to schools across the country to support assessment set-up and delivery
  – Talking to schools that wished to withdraw about benefits of trial
Challenge 3: Attrition

- 84 schools signed up and agreed to do the assessment
- Immediately after randomisation
  - 2 schools did not complete baseline assessment in time frame – not told their allocation
  - 3 schools did not complete any post-test assessment
    - 1 intervention: 2 control; 1 total loss of contact, 2 technical difficulties
- Current work into effect attrition has on results – order of the last 25% of schools to submit testing – look at how results would have looked if hadn’t made the effort to gather the last data
Challenge 3: Missing data

- Data from 79/82 schools for primary outcome
- Focus on collecting primary outcomes - Maths
- How do we treat missing data?
  - Missing due to technological difficulties
  - Missing due to absence or moving school

<table>
<thead>
<tr>
<th></th>
<th>Primary outcome</th>
<th>Secondary outcomes</th>
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<tbody>
<tr>
<td></td>
<td>General maths</td>
<td>Mental arithmetic</td>
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<tr>
<td>% missing data</td>
<td>15%</td>
<td>17%</td>
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<tr>
<td>participants</td>
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<tr>
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<td>4%</td>
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<td>schools</td>
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Challenge 4: Interpreting results

<table>
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<tr>
<th>Group</th>
<th>Effect size</th>
<th>Estimated months’ progress</th>
<th>Security rating</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Intervention vs. control (Year 3)</td>
<td>0.01</td>
<td>0</td>
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<tr>
<td>Intervention vs. control (Year 5)</td>
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<td>+1</td>
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<tr>
<td>Free School Meal pupils (Year 3)</td>
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<td>-1</td>
<td></td>
<td>–</td>
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<tr>
<td>Free School Meal pupils (Year 5)</td>
<td>0.05</td>
<td>+1</td>
<td></td>
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</tbody>
</table>

Note. Effect sizes are converted to months’ progress on the basis of Table 1 in Higgins, et al. (2013).

Table taken from the Durham Shared Maths Project Executive Summary published on the EEF website.

- Very little effect of the intervention on maths achievement.
- Results do not support current literature
Challenge 4: Interpreting results

• Why was there no impact?
  – problem with trial e.g. assessment, counter factual
  – Schools didn’t do intervention well (IF)
  – Intervention doesn’t work (previous data is biased?) – many very small trials
  – Roll-out nature of intervention?

• Replication of trial?
• Need to clearly think about counterfactual
Conclusions

• This was a well run trial – minimal attrition, good IF
• Some aspects of educational trials always going to be tricky e.g. recruitment, assessment, maintaining control schools
• What do we do when a good trial shows that an evidence-based intervention has no impact?
• Replication?

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