Education Endowment Foundation

Research Learning Communities

Evaluation report and executive summary

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Independent evaluators:

Dr Jo Rose, Professor Sally Thomas, Dr Lei Zhang, Dr Anna Edwards, Dr Andres Augero, Ms Pooneh Roney

University of BRISTOL

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement, ensuring that children from all backgrounds can fulfil their potential and make the most of their talents.

We aim to raise the attainment of children facing disadvantage by:

- Identifying promising educational innovations that address the needs of disadvantaged children in primary and secondary schools in England;
- Evaluating these innovations to extend and secure the evidence on what works and can be made to work at scale;
- Encouraging schools, government, charities, and others to apply evidence and adopt innovations found to be effective.

Founded by the education charity the Sutton Trust, as lead charity in partnership with Impetus Trust, the EEF is funded by an initial £125m grant from the Department for Education. With investment and fundraising income, the EEF intends to award as much as £200m by 2026.

For more information please contact:

Danielle Mason
Head of Research
Education Endowment Foundation
9th Floor, Millbank Tower
21-24 Millbank
SW1P 4QP

p: 020 7802 1679
e: danielle.mason@eefoundation.org.uk
w: **www.educationendowmentfoundation.org.uk**

About the evaluation team

The independent evaluation team was led by Dr Jo Rose at the University of Bristol, and supported by Professor Sally Thomas (impact evaluation lead), Professor Tim Jay, Dr Sara Speybroeck, Dr Anna Edwards, Dr Lei Zhang, Dr Andres Aguero, Ms Pooneh Roney, and Professor Kelvyn Jones. The team was responsible for the design and delivery of the evaluation, including collection of pupil outcomes from the National Pupil Database, baseline and outcome surveys of teachers in participating schools, process evaluation surveys of Evidence Champions, interviews with staff, observations of project workshops, and reporting of outcomes. Questionnaires for the baseline and outcomes surveys of teachers were developed by the National Foundation for Educational Research (NFER) (Poet *et al.*, unpublished) and used across all projects in the EEF 'research use' round of evaluations.

Contact details:

jo.rose@bristol.ac.uk

Dr Jo Rose
Graduate School of Education
University of Bristol
35 Berkeley Square
Bristol
BS8 1JA
UK

0117 331 4109

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Executive summary

The project

Research Learning Communities (RLC) was an intervention that aimed to improve teaching quality and learning outcomes by raising teachers' awareness, understanding, and use of educational research in their teaching practice. Two Evidence Champion teachers from each school attended four RLC workshops with peers from up to four other schools. Workshops were delivered by academics from the Institute of Education at University College London and examined research relating to an area of interest agreed with the schools (for example improving literacy or numeracy via growth mindsets). The Evidence Champions were then required to develop, apply and evaluate school or key-stage wide improvement strategies using the learning from the workshops; and to support other teachers in the school, aiming to raise their awareness, understanding and use of research.

The trial was funded by the Education Endowment Foundation (EEF), the Department for Education and the Mayor's London Schools Excellence Fund as part of a round of funding exploring Research Use in Schools. The intervention ran for two academic years (from October 2014 to June 2016). This project used a randomised controlled trial to measure the impact of the intervention on teacher research engagement (measured with a survey) and on KS2 reading outcomes for Year 6 pupils.

The evaluation was an efficacy trial. Sixty primary schools working across 14 RLCs were allocated to the treatment group, and 59 to the control group. A total of 5462 pupils were involved. The process evaluation included staff interviews, surveys of the Evidence Champions, and visits to RLC workshops.

Key conclusions	
1.	The project found no evidence that Research Learning Communities improves reading outcomes for children at Key Stage 2.
2.	The project did find a positive impact on teachers' disposition towards research. There was, however, some evidence that this impact may have been influenced by other factors such as the level of postgraduate qualifications or seniority of teachers that took part in the intervention.
3.	Exploratory analysis identified some evidence of a small positive relationship between teachers' disposition towards research and pupil outcomes, irrespective of involvement in an RLC.
4.	Evidence Champion roles in each school were intended to be held by the same people throughout the intervention, to support the development of a research-focused culture within each school. Staff turnover was therefore a barrier to implementation.
5.	Some teachers felt that it may take a number of years for participation in an RLC to change teaching practice and improve pupil outcomes. Future research could therefore examine longer term impacts.

EEF security rating

The finding for the primary outcome of reading has very high security. This trial was an efficacy trial, which tested whether the intervention worked under developer-led conditions in a number of schools. The trial was a well-powered, well-designed, two-armed randomised controlled trial. Relatively few pupils who started the trial were not included in the final analysis. The pupils in RLC schools were similar to those in the comparison schools in terms of levels of FSM eligibility and prior attainment.

Additional findings

There was no evidence that RLC had an impact on the primary outcome of reading at Key Stage 2. Impacts on the secondary outcomes of KS2 Numeracy and KS2 Grammar, Punctuation and Spelling, were generally small, and none were statistically significant. The results were similar for pupils eligible for free school meals, providing no evidence of a differential impact for these pupils.

The impact evaluation on teacher outcomes suggests that at the end of the intervention, teachers in intervention schools typically reported a greater disposition towards use of research evidence to inform their practice, in comparison to teachers in control schools, although once teacher background characteristics (such as leadership status and holding a postgraduate qualification) were controlled for this result was not statistically significant.

There is also some evidence to suggest a link between the survey results and attainment outcomes. The more positive the disposition of KS2 teachers towards research use, the higher the pupils' KS2 Grammar, Punctuation, and Spelling outcomes, and KS2 Numeracy outcomes, irrespective of whether teachers were in intervention or control schools.

The process evaluation found that staff turnover, and the competing priorities and limited time of teachers were barriers to successful implementation, because Evidence Champions need to be able to commit to the full duration of the intervention, attend all the workshops, and have time in school to develop their ideas and discuss the project with their colleagues. A lack of access to resources such as subscription journals may also limit the successful implementation of RLC activity by restricting the range and recentness of the evidence that teachers can draw on, although there is a general trend towards improving access to evidence for all audiences.

The lack of impact on pupil outcomes discussed above may be partly due to the relatively short time scale: changes to school culture and teachers' professional development may take longer than two years to translate into improved pupil outcomes. If this is the case, the tentative evidence of an impact on teachers' research engagement, and of a relationship between teacher research engagement and pupil outcomes, indicates that it may be valuable to assess the impact of RLC over a longer time period.

Cost

The average cost for each school is around £860, or £3 per pupil per year when averaged over three years. The costs vary depending on the number of schools in an RLC, and the number of pupils in each school. In this intervention, there was also an additional one-off cost of £2500 per RLC for social network analysis, which was used to determine who would be best placed to act in the role of evidence champion, but this was not considered part of the intervention itself.

Table 1: Executive summary table of impact on pupil outcomes

Outcome	Number of pupils	Effect size (95% confidence)	Estimated months' progress	P value	EEF cost rating	EEF security rating
Reading	5462	0.02 (-0.09,0.12)	0 months	0.74	£ £ £ £ £	🔒🔒🔒🔒🔒

Introduction

Intervention

The Research Learning Communities (RLC) project focuses on promoting and embedding the use of research in schools. As part of a randomised controlled trial (RCT) involving 119 schools, 60 primary schools were allocated to the treatment condition for the intervention, delivered in 2014/2015 and 2015/2016 by a team of academics from the Institute of Education at University College London.

The delivery team used social network analysis to identify and recruit two to three potential 'Evidence Champions' from each school. This process allowed relationships between individuals in the school to be mapped and measured so that the nature and strength of those relationships could be understood. The process involved surveys with all teaching staff to determine which members of staff had most influence in terms of sharing ideas for practice. The intervention team recommended that at least one Evidence Champion came from the senior leadership team—to ensure that the intervention was seen by teachers to be supported by the school leadership—and the others could be any teacher to whom staff looked to for advice and ideas as highlighted by the social network analysis. Evidence Champions came together in RLCs. There were 14 RLCs in total and each comprised Evidence Champions from up to five schools. Each RLC met for a one-day workshop four times a year to examine research and evidence relating to an agreed area of focus. Prior to the first workshop, the intervention team offered schools a list of possible topics. Schools indicated from this list the options that they were interested in exploring, and a shared area which encompassed schools' interests was suggested by the intervention team. Examples of foci included:

- writing and the use of language;
- consideration of how the use of feedback, marking, and moderation impact on the development of growth mindsets;
- the role of teachers, parents, and pupils in feedback, marking and moderation;
- effective grouping and setting and the development of growth mindsets amongst different groups of pupils;
- growth mindsets;
- improving literacy through growth mindsets;
- improving literacy through the development of feedback, marking and moderation and the development of growth mindsets;
- what makes outstanding teaching and learning in mathematics for all groups of pupils;
- effective feedback, marking and moderation;
- improving literacy through feedback, marking and moderation; and
- improving comprehension and use of language.

The Evidence Champions took ideas from each workshop back to their schools to develop, apply, and evaluate school- or key-stage-wide improvement strategies based on this evidence. (For more details of activities in school, see 'inter-sessional activities' below.) The intention was for staff in schools to implement some kind of improvement strategy and collect data to understand its impact. Workshops were held in participating schools: some were held solely in one school (for example, if that school was particularly accessible and had good facilities for whole-day staff meetings); other RLCs alternated workshop venues over the course of the year. The evaluation focused on the cohort of pupils who were in Year 5 in 2014/2015, and Year 6 in 2016/2017. These pupils were due to undergo a statutory national assessment towards the end of the two-year intervention period, so there was no need to administer an additional pupil outcome measure to assess impact.

During the first year, a member of the delivery team who led the information-sharing in workshops facilitated group activities, supplied resources, and provided inter-sessional support for all participants, including a scheduled phone call and email contact with all individual Evidence Champions. The second year of the intervention involved RLCs being led by the Evidence Champions with 'light touch' support by the member of the delivery team: in this second year, the workshops were led by participants with the facilitator acting as a critical friend and guide, still providing inter-sessional support. In the second year, each workshop was divided into three parts: part one was led by participants and covered the main substantive focus detailed below, with the facilitator acting as a critical friend; part two was used to discuss with participants what was required from the following workshop, and who would be leading; part three included an element of capacity-building around research methods. All workshops referred to explicit learning outcomes as well as a recap of previous work. The workshop cycle agendas were the same in Year 1 and Year 2, the difference being in (a) the starting points of the schools and Evidence Champions, and (b) the responsibility for leading and facilitation. The plans below worked as a guide rather than an exact plan: in some cases, for example, discussion may have led to topics from a future workshop being introduced by the facilitator.

The agenda of each workshop was as follows:

Workshop 1 (November/December)

- identifying and justifying what is good or best practice;
- engaging with findings from research;
- reflection on how research informs thinking about practice;
- developing a research question for a school's action research;
- understanding baseline evidence; and
- ways of sharing ideas with colleagues.

Inter-sessional activities included creating formal opportunities for colleagues to engage with research, discussion of research question with colleagues, and collection of baseline data.

Workshop 2 (January/February)

- analysing baseline data;
- considering current situation and potential ways forward;
- discussing research on professional development; and
- exploring ways of trialling a specific approach to practice.

Inter-sessional activities included sharing the proposed approach with colleagues, and trialling the approach in school.

Workshop 3 (March/April)

- reflecting on how the approach is working, and how it can be refined;
- engaging with evidence on change management;
- consideration of plan for whole-school roll-out of approach; and
- developing plan for how impact of whole-school roll-out can be measured.

Inter-sessional activities include refining and rolling out approach, and recording impact.

Workshop 4 (June/July)

- analysis of impact data;
- discussion of how knowledge about impact can be used by the school;

- determining the future focus of engagement with research;
- accessing research evidence; and
- understanding research quality.

Some issues that arose with the delivery included: the continuity of the Evidence Champions across years (in some schools different people were allocated the role in Year 2); continuity of Evidence Champions across workshops (some schools sent different people to different workshops); and attendance at the workshops (not all evidence champions were able to attend every workshop, despite schools providing a commitment in the MoU to releasing evidence champions for the four workshops). These will be discussed in more detail later.

Background evidence

In recent years, there has been an international trend towards the use of evidence to inform practice (Caldwell *et al.*, 2015). Both in the U.K. and internationally, greater focus has been placed on addressing the gap between research evidence and professional practice and policy (Cooper, Levin and Campbell, 2009; Nutley, Walter and Davies, 2007). In particular, policy makers have shown a growing interest in promoting evidence-based approaches in education (Caldwell *et al.*, 2015). For instance, initiatives such as ResearchED in the U.K. have aimed to bridge the gap between research and practice in education by bringing together researchers, teachers, and policy makers. These initiatives, in turn, have resulted in higher demands for research evidence (Bennet, 2015) and increased funding of projects that examine the impact of research-use in schools (Caldwell *et al.*, 2015). The fact that 'existing teaching practice is not systematically evidence informed' (Judkins, 2014, p. vi) is perhaps what has led to the emergence of these recent projects.

Defining and agreeing on what the term 'evidence' represents still remains problematic (Caldwell *et al*., 2015). Furthermore, there are many complexities in the relationship between research and practice in education (Caldwell *et al*., 2015). To overcome these challenges, a number of researchers have attempted to define sharing of evidence and research as 'knowledge mobilisation' (Speight, Callanan, Griggs, and Cartagena Farias, 2016; Nelson, 2015; Levin, 2013; Cooper *et al*., 2009). Moreover, the recent development of a reliable research-use outcomes survey (by NFER and the EEF) is paving the way for defining and measuring teachers' engagement with research, providing an instrument that can be used in a variety of contexts (Nelson, Mehta, Sharples and Davey, 2017).

Nevertheless, Goldacre (2013) argues that despite much enthusiasm for, and the development of, a variety of programmes aimed to mobilise knowledge within the teaching profession, evidence-based approaches in teaching remain limited, and Brown and Zhang (2016) highlight that using evidence consistently to improve practice is, in many cases, difficult to achieve. He proposes that the lack of 'basic structures needed to support evidence-based practice' as central to limited use of evidence-based approaches in teaching and suggests that the development of an 'information architecture' offers great promise (Goldacre, 2013, p. 15). This could include systems for disseminating research to teachers in easily accessible formats. Teachers also need to be aware of methods for conducting research to enable them to critically engage with research findings, and for some, potentially be able to conduct their own research.

Sharples (2013) suggests that the ultimate goal should be to 'empower professionals with evidence […] integrating professional expertise with the best external evidence from research to improve the quality of practice'. To improve the effectiveness of research use in education, existing barriers need to be overcome (Cooper *et al.*, 2009; Levin, 2013). Skill and resource shortages (such as teachers' inability to interpret research evidence, insufficient time, or lack of access to research literature) plus the lack of systemic incentives are some of the existing barriers to evidence- based practices in education (Speight *et al.*, 2016; Nutley *et al.*, 2007; Sharples, 2013; Hemsley-Brown and Sharp, 2003). Furthermore, it is suggested that simply summarising research is not effective and that it is vital for evidence to be transformed for use by practitioners (Nelson *et al.*, 2017). This, in turn, requires collaboration between

researchers and teachers and moving beyond 'knowledge exchange' with the goal of effective implementation in schools (Speight *et al.*, 2016; Nelson and O'Beirne, 2014).

It is worth noting that there also remains an implicit assumption that *all* research will have a positive impact for *all* teachers and schools (Caldwell *et al*., 2015). While schools may have the capacity and the appetite to engage with research-based initiatives, there is no guarantee that this will result in improvements in educational outcomes (Nelson and O'Beirne, 2014; Caldwell *et al.*, 2015). In fact, a review by NFER found little evidence of impact on pupils' attainment (Nelson and O'Beirne, 2014). This review highlighted the need to develop an infrastructure for knowledge mobilisation to support teachers in using evidence to develop their practice. 'Knowledge mobilisation' refers to the process through which evidence is produced through research, then made accessible to, and implemented by, practitioners. Nelson and O'Beirne highlighted the need for researchers to go beyond just summarising research for practitioners and outline how the findings can be used. They further suggested that there is a need for practitioners to develop skills in engaging with, and conducting, their own research to improve pupil outcomes.

As highlighted by a number of reviews, until recently the literature on teachers' knowledge and use of research evidence had been limited (Nelson and O'Beirne, 2014, Leat, Lofthouse and Reid, 2014; Dagenais *et al.*, 2012). While this body of research is rapidly growing, it is suggested there is still a gap in the literature on 'the effects of evidence-based approaches on schools, teachers and pupils, and how to increase the likelihood of better outcomes for learners in particular' (Caldwell *et al.*, 2015, p. 9). As a result, more recently, projects have aimed to examine the relative efficacy of the different approaches to evidence-use, with a number of projects focusing on finding best approaches (Speight *et al*., 2016). There have been some promising findings from these recent projects. For instance, a survey study showed that while evidence-based approaches in education are still rather new, teachers recognise the potential of these approaches for informing their practice (Nelson *et al.*, 2017). Another study, addressing evidence-informed CPD, reported 'some improvement' in teachers' perceptions of, and attitude to, evidence use, although this could not be attributed to the programme used in the study (Speight *et al.*, 2016, p. 28). However, the teachers who were directly involved in the programme showed greater improvement, supporting the likely impact of the programme on their attitudes. Speight and colleagues (2016) identified lack of time and the difficulties associated with implementing the research in educational settings as the primary barriers to teachers' use of evidence-based approaches.

It can be argued that the use of randomised controlled trials to understand the impact of approaches to developing evidence-informed practice in education has inherent limitations. Caldwell *et al.* (2015) highlight how this strategy simplifies the complexities of such approaches and their impact in different settings and contexts. Future research, therefore, needs to focus on identifying the relative effectiveness of different approaches and the conditions under which the benefits are realised (Caldwell *et al.*, 2015), with the ultimate goal of developing 'a range of tried and tested strategies for schools to adopt, in order to enable teachers to use research evidence to inform their practice' (Judkins, 2014, p. 6).

The RLC intervention uses the concept of knowledge mobilisation to build on the emerging evidence-base exploring *how* teachers can use research to inform their practice. It aims to provide scope for teachers to engage with and use research evidence in ways that is appropriate for their own school cultures and own practice: in the intervention, teachers are facilitated and supported to develop their own research-informed cultures in schools. The intervention therefore acknowledges the complexity of contexts and seeks to support engagement with research within different contexts, rather than in spite of them. The evaluation took the form of a large-scale efficacy trial, with the developers delivering the intervention. The concept of Research Learning Communities is a new approach, a development from previous similar approaches such as Professional Learning Communities and Networked Learning Communities (Harris and Jones, 2012). This is the first time that Research Learning Communities has been run in schools.

Evaluation objectives

The intervention was run by the developers across 59 schools: one school dropped out of the project after randomisation but before the intervention started. Research questions for the impact evaluation include:

1. What is the impact of RLCs on:
    a. pupil attainment in Key Stage 2 reading (primary outcome)?
    b. pupil attainment in KS2 numeracy, grammar, punctuation and spelling (secondary outcomes)? and
    c. teachers' awareness, understanding, and use of research, as measured by six variables on the research use survey?
2. How do levels of teachers' awareness, understanding, and use of research impact on pupil attainment in KS2 reading?

Reading (formerly 'literacy') was chosen as a primary outcome by the EEF because it was seen to be the most general or broadest measure of pupil attainment available from KS2 tests. There was a wide range of foci over RLCs to ensure that schools were able to focus on what was relevant for their own contexts, so no single pupil outcome measure would directly match the foci for each RLC—hence the need for as general or broad a measure as possible.

Research questions for the implementation and process evaluation include:

1. How do RLCs and the role of Evidence Champions work in practice?
    a. What are the characteristics of schools where RLCs and the role of Evidence Champions appear to be successful?
    b. What barriers to the success of RLCs and the Evidence Champion role are reported by teachers, headteachers, and Evidence Champions?
    c. How attractive is the idea of Evidence Champions and RLCs to schools?
    d. What are the necessary prerequisites for the use of research to change teachers' practice?
    e. How do teachers and Evidence Champions expect the process of RLCs to impact on their practice and on pupil attainment?
2. How were the RLCs delivered?
    a. How does the Institute of Education work with Evidence Champions to develop their ideas about research?
    b. How do Evidence Champions enact their role in schools?
3. What are the perceived outcomes of the Evidence Champions and RLCs in schools, including possible negative effects?
4. Are there any ways in which RLCs and the role of Evidence Champions can be improved?
5. How do control schools compare to RLC schools in their engagement with research evidence?

The full evaluation protocol can be found **here**.

Ethical review

The evaluation underwent an ethical review by the University of Bristol's Faculty of Social Sciences and Law Ethics Committee and was approved in July 2014. The project was conducted in accordance with the Graduate School of Education's ethical practice guidelines and in line with British Educational

Research Association's 'Revised Ethical Guidelines for Educational Research' (2004), ensuring anonymity. No individual school, teacher, or pupil are identifiable. Parents of the 2015/2016 Year 6 cohort were given the opportunity to opt out of their child's data being used for the research. Teachers from participating schools were informed via their schools by letter (prior to distribution of the survey link) about the nature of the research, and that they would receive a request to participate in the survey, but that they did not need to take part if they did not want to. Case study participants for the process evaluation were again informed about the nature of the research and that participation was voluntary.

Project team

The project delivery team was led by Dr Chris Brown at the Institute of Education, University College London. The intervention workshops were developed and delivered by members of the delivery team.

The independent evaluation team was led by Dr Jo Rose at the University of Bristol, and supported by Professor Sally Thomas (impact evaluation lead), Professor Tim Jay, Dr Sara Speybroeck, Dr Anna Edwards, Dr Lei Zhang, Dr Andres Aguero, Ms Pooneh Roney, and Professor Kelvyn Jones. The team was responsible for the design and delivery of the evaluation, including collection of pupil outcomes from the National Pupil Database, baseline and outcome surveys of teachers in participating schools, process evaluation surveys of Evidence Champions, interviews with staff, observations of project workshops, and reporting of outcomes. Questionnaires for the baseline and outcomes surveys of teachers were developed by the National Foundation for Educational Research (NFER) (Poet *et al.*, unpublished) and used across all projects in the 'research use' round.

Trial registration

The trial has been registered during reporting with registration number ISRCTN14382473.

Methods

Trial design

The trial is an efficacy trial, with the intervention being delivered by the developers across treatment schools. The unit of randomisation is schools (or in some cases, clusters of schools) with a treatment or control condition. The control condition uses a 'business as usual' model, with schools being provided with a financial incentive of £1,000 for full participation in the evaluation. 'Full participation' involves all Year 5 and Year 6 teachers completing rounds two and three of the teacher survey; Year 3 and Year 4 teachers also completing surveys—to give 75% of KS2 teachers overall completing rounds two and three of the teacher survey; and the provision of 2015/2016 Year 6 cohort UPNs in class lists with teacher names. Survey responses from Year 5 and Year 6 teachers were used in the second part of the analysis that matched teacher responses to pupil outcomes, and survey responses from teachers across the whole school were used in the teacher outcomes analysis comparing responses in control and treatment schools. Schools that did not 'fully participate' received a partial incentive: £500 for survey completion, or £250 for provision of UPN data.

Participant selection

The project sought to recruit primary schools in England; all primary schools were eligible regardless of location. The recruitment strategy was led by the delivery team. They approached all primary schools in the Institute of Education's Research and Development Network (which allows members access to professional development opportunities and aims to support innovation and evaluation of new ways of working), and advertised the project through a range of other networks. Recruitment events were held in London, to which interested schools were invited to find out more about the project, and the delivery team also travelled to other areas of England including Devon, Leicestershire, and Yorkshire to discuss the project with other schools. The evaluation team attended some of the recruitment events to help explain what participation would entail, and also circulated the project details around their networks.

The condition for being allocated to treatment or control groups was that at least 75% of KS2 teachers in the school complete the baseline ('round one') survey, and the headteacher and chair of governors of the school sign the Memorandum of Understanding. The latter included agreement to: participate in the evaluation following randomisation to the treatment or control condition; to support Evidence Champions' participation in RLCs (if allocated to the treatment condition); to provide class lists and UPNs for pupils in the 2014/2015 Year 5 cohort and for pupils in the 2015/16 Year 6 cohort; and teachers completing rounds two and three of the surveys. Consent for participation in the intervention was therefore provided by the headteacher and chair of governors of each school, and consent for participation in the evaluation surveys and case-study interviews was provided by individual teachers. As KS2 attainment data is collected as standard practice in schools, parents were approached by schools in the 2015/2016 academic year for opt-out consent for the use of KS2 assessment data. The Memorandum of Understanding and consent forms can be found in Appendices C–F.

Outcomes measures

The primary outcome measure was 2015/2016 KS2 attainment data in reading for the cohort of pupils in Year 5 at the start of the intervention. Secondary outcomes include KS2 attainment in grammar, punctuation, spelling and numeracy, as well as six teacher outcomes as measured by the Research Use Survey (Poet *et al.*, unpublished; see Table 2 for names of individual items). The intervention aimed to impact on teachers' practice through developing their engagement with research. The research foci of RLCs were determined by the Evidence Champions. Given that foci differed between RLCs, but the evaluation needed a single primary outcome (measure of pupil attainment) across the trial, the broadest measures of attainment available from KS2 testing were the most appropriate to use. Measuring teacher outcomes was crucial due to the nature and aims of the intervention. The final NFER Teacher Research Use Survey (round two and three) was developed for all EEF evaluations in the Research

Use round of interventions. While the original plan was to develop three measures of teacher awareness, understanding, and use of research, the final survey developed ended up with six measures of teachers' engagement with research. Note that the initial baseline (round one) survey of teachers research use was different and much shorter than the subsequent final Teacher Research Use survey, although both were developed by NFER. The baseline survey was not intended to be used in any outcome analyses given it was designed only to provide basic snapshot information to the RLC intervention team as well as a means of demonstrating schools commitment to provide data and be involved in the project.

KS2 attainment data were collected as part of the national testing system in England and data were obtained anonymously using UPNs and school identifiers from the National Pupil Database. A new format of KS2 testing was used in the 2015/16 academic year, with Literacy being split into two measures: Reading; and Grammar, Punctuation and Spelling. Writing is assessed via teacher assessment in the new KS2 tests but this measure was not employed due to concerns about low correlation with other KS2 measures (Allen, 2016) . Teacher surveys were collected via Bristol Online Surveys electronic survey tool. Table 2 shows the reliability of the six teacher measures created from the Teacher Research Use Survey in round two and round three (see Poet *et al*., 2015 for further details of teacher measures).

Table 2: Cronbach's alpha scores for the survey measures

Survey outcome measure	Cronbach's alpha Round 2	Cronbach's alpha Round 3	Reliability
Measure 1 (positive disposition to academic research in informing teaching practice)	0.84	0.84	Good
Measure 2 (use of academic research to inform selection of teaching approaches)	0.62	0.59	Questionable
Measure 3 (perception that academic research is not useful to teaching)	0.57	0.56	Poor
Measure 4 (perception that own school does not encourage use of academic research)	0.58	0.58	Poor
Measure 5 (active engagement with online evidence platforms)	0.57	0.58	Poor
Measure 6 (knowledge of research findings and methods)	0.53	0.52	Poor

The reliability, in this project, of the survey measures used highlights the need for caution in the interpretation of any results using the survey data. Measures 3 to 6 have poor levels of internal reliability and as such the conclusions we can draw about these concepts are limited.

Sample size

Power calculations for this design were inevitably an approximation, with various assumptions being made about the structure of the data. A conservative calculation of the minimum detectable effect size was made using Optimal Design software, with the following assumptions:

- Schools will be allocated in equal proportions to the treatment and control condition.
- There will be a baseline covariate of KS1 reading and writing points scores, for KS2 literacy outcomes, at 0.73.
- An intra-cluster correlation of 0.2.

- Where schools signed up to the project in groups, each group of two, three, four, or five schools will be treated as one unit (this makes the calculation particularly conservative as there will be a lot of variation within each of these units). In instances where individual schools have signed up not as part of a group, these individual schools will also be treated as a unit. (For further details of this process please refer to the section on randomisation below.)
- An average of 50 pupils in the cohort per unit (this, again, is conservative as some units will comprise more than one school and will involve many more than 50 students—even though some schools will be smaller than this).

With 90 units, the design would be able to detect an effect size on pupil attainment of 0.16. With 70 units, the minimum detectable effect size rises to 0.18.

The actual number of units used during the randomisation process was 71, giving a minimum detectable effect size of 0.18.

Randomisation

Schools were allocated to treatment and control groups using the minimisation method in MinimPy to ensure balance of school-level variables of size of school, %FSM, and attainment at KS2. The sample size was not large enough to warrant balancing on further variables as well. It was important to be aware of school alliances in this process. In total, 119 schools were recruited, though some signed up to the intervention in federations or alliances, and some as individual schools. Where groups of schools signed up, the size of the group determined how they were treated in the randomisation:

- Large alliances of six schools or more (n = 5) were split into two groups using the minimisation method, based on size of school, percentage of FSM pupils, and KS2 attainment. Of these split alliances, one group was randomly allocated to the treatment condition and one to the control condition.
- The remaining schools recruited were in units of either single schools (n = 54), federations or alliances comprising pairs (n = 6), or groups of three (n = 3) or four (n = 3) schools.

This gave 71 units in total. These units were allocated to the treatment or control group using the minimisation method, based on size of unit (single school, two or three schools, and four or five schools), average size of school in each unit, average percentage of FSM pupils in each unit, and average KS2 attainment in each unit.

The majority of units comprised single schools, but this method allowed for federations of schools or alliances who signed up because they wanted to work together. Using this method, 60 primary schools were allocated to the treatment group and 59 to the control group.

Analysis of pupil outcomes

There are two parts to the analysis of pupil attainment in 2016 KS2 outcome data (in both parts using the 2014/2015 Year 5 intention to treat cohort sample). These are subsequently referred to as ‘Part 1’ and ‘Part 2’.

Part 1 uses multi-level modelling (MLM) to determine the effect size of the impact of the intervention on pupil attainment in reading at KS2 (primary outcome) and numeracy, grammar, punctuation and spelling (secondary outcomes)—accounting for clustering of pupils within schools (in random part by allowing random variation across schools). It was originally intended to consider ways to take account of clustering of intervention schools within RLC groups (see the Analysis section in the statistical analysis plan, 'SAP'), however, after testing preliminary models, this approach was not seen as appropriate due to confounding between RLC group and intervention and control categorisation. Moreover, grammar, punctuation, and spelling at KS2 is also used as a secondary outcome in addition to KS2 outcomes indicated in the SAP as this was considered to provide relevant and useful additional evidence on the impact of the RLC intervention on key aspects of literacy. Included in the fixed part of the model are:

- a dummy variable for intervention group and prior KS1 attainment (from the NPD database);
- FSMever eligibility dummy variable (from the PLASC/School Census), and relevant dummy variables for each of the variables used for the school randomisation (size of school in three categories (low/medium/high);[1]
- %FSM in two categories (low/high);[2] and
- 2013 KS2 attainment in two categories (high/low) as covariates.[3]

Part 1 does not include, and is not linked to, the teacher survey data, but is a separate, stand-alone analysis.

Part 2 involves linking individual teacher questionnaire data (from the 2015 round two survey) with pupil KS2 attainment data using combined Year 5 and Year 6 teacher name and student name UPN class lists provided by the schools (to match teachers to their pupils). For each pupil, six mean Year 5 and Year 6 Teacher Survey variables were calculated (reflecting different levels of teacher awareness, understanding, and use of research for the six measures described in Table 2 above) by averaging the round two survey responses of their specific Year 5 and Year 6 teachers. Multi-level modelling is used to understand whether different levels of teacher awareness, understanding, and use of research—as represented by these six variables—can explain, or are related to, differences in pupil attainment at KS2. The intervention dosage (number of RLC workshops attended by the Evidence Champion) is also examined in terms of whether this aspect can explain pupil KS2 outcomes as outlined in the SAP (see 'on-treatment analysis' in Analysis section). The clustering of pupils within schools is taken into account using the same approach as in Part 1. The outcome variables for this are the same as Part 1 (2016 KS2 attainment in the areas listed for the 2015 Year 5 intention-to-treat cohort sample). Round two of the survey will be used because teachers' research use as indicated by the round two survey is more likely to be reflected in their teaching the following year leading up to the KS2 SATs assessment for the cohort of interest—and therefore may bear some relationship to pupil outcomes. Round three of the survey is collected six weeks or more after the SATs and would probably not be a good reflection of how teachers have taught over the previous two years leading up to the measurement of pupil outcomes. Changes that may have taken place in teachers' research use between rounds two and three of the survey (as measured by the latter) would be unlikely to have fed through into their teaching practice, and from there into pupils' learning, over the relevant timescale.

Analysis of teacher outcomes

The survey analysis uses multi-level modelling (MLM) to determine the effect size of the impact of the intervention on each of the six summary research engagement outcome measures, also taking account of the nesting of teachers within schools. The six teacher outcome measures are calculated for each teacher respondent using the round three teacher survey. Teacher type variables are explored as additional potential explanatory variable for use in the MLM analyses. Teacher type variables are:

- status:
    - classroom teacher;
    - middle leader (such as head of department, subject, or curriculum area leader);
    - senior leader (deputy or assistant headteacher);
    - headteacher, principal or director;

[1] 'Low': 210 pupils or fewer (one class of 30 per year); 'medium': 211–420 pupils (one or two classes per year; control, N = 26; intervention, N = 25); 'large': over 420 pupils (more than two classes per year; control, N = 20; intervention, N = 17, where N is the school sample).
[2] 'High': above the 2013 national average of 19.2% for maintained nursery and primary schools (control, N = 26; intervention, N = 22); 'low': the 2013 national average or below (control, N = 31; intervention, N = 37).
[3] 'High': above the 2013 national average of 75% achieving level 4 in reading, writing and maths (control, N = 35; intervention, N = 44); 'low': at the 2013 national average or below (control, N = 22; intervention, N = 15).

  - SEN teacher;
  - supply, cover or Planning, Preparation and Assessment (PPA) teacher;
  - high level teaching assistant;
  - music or PE extra curricula teacher;
- 'holds postgraduate qualifications';
- years of teaching; and
- years of teaching in current school.

A separate analysis considers whether teacher responses to the survey change from round two, after the first year of the intervention, to round three, after the second year of the project at which time schools will be more independent in leading the RLCs.

The analyses detailed above are conducted using Stata software (StataCorp, 2015) which provides equivalent results to other software such as MLwin. Due to the nature of the project and survey responses, it is impractical to conduct the analysis blind to group identity.

On-treatment analysis

In addition to the analysis to determine the effect size of the impact of the intervention on pupil KS2 attainment, an additional, more sensitive, analysis alternatively uses the level of school engagement with the RLC programme instead of simply 'intervention/control group' in equivalent analyses of each student attainment outcome. This intervention dosage variable has been measured by the attendance records of Evidence Champions at eight workshops that took place over the two years of the project. Each workshop was either attended by no, one, or two Evidence Champions providing us with a variable ranging from 0 to 16 for each treatment school. This variable effectively describes the extent of intervention 'dosage' and provides additional evidence on the strength of the intervention impact.

Subgroup analyses

Separate subgroup analyses are also conducted for Part 1 of the student outcome analysis. This considers FSMever/non-FSMever groups and schools' choice of focus in the workshops at the beginning of the project (literacy, 50 schools, or numeracy, 9 schools—as coded by the evaluation team according to information provided by the project team) as well as the interaction of these subgroups with intervention group. This analysis uses the final model to determine the effect size of the impact of the intervention on pupil attainment for subgroups.

Effect size calculation

The effect size is calculated in line with EEF guidance. This involves using the total variance after adjusting for prior attainment, FSMever, and other covariates described in Part 1 above. This is calculated using the random part estimate (pupil-level) from the final Multilevel model estimated in STATA. As indicated in SAP, all outcome and baseline attainment variables are standardised using normal scores as well as teacher Research Use Survey measures (1–6). The intervention dosage measure was not standardised but centred on mean. The effect size is represented by: (Coefficient for treatment group)/√(total variance after controls). The confidence interval is calculated using fixed part estimate for intervention dummy +/- 1.96 x Standard Deviation.

All multilevel modelling analyses were conducted using Stata (StataCorp, 2015) and other analyses employed SPSS (IBM Corp, 2016).

The statistical analysis plan (SAP) can be seen **here**.

Implementation and process evaluation

The process evaluation involved case studies of eight participating schools (six treatment and two control), observation of Evidence Champions at RLC workshops, and Evidence Champion surveys.

Case study schools were selected using purposive sampling, to allow for a range of approaches to using research, as defined by the first round of teacher surveys at the recruitment phase. Case studies and observations were carried out by members of the evaluation team, and surveys were distributed to schools by the evaluation team.

It was planned to make two visits for each case study: one during the first year of the intervention cycle and one at the end of the second year. However, while all eight schools initially agreed to participate as case studies, one control school did not respond to repeated attempts to contact it in the second year, and one treatment school had a change of headteacher and, after initial discussion in the second year, did not respond to attempts to arrange a second visit. As such, six treatment schools and two control schools were visited in the first year of the intervention but only five treatment schools and one control school were visited in the second year of the evaluation. Each visit involved interviews with the Evidence Champions, a member of the senior management team, and, where available, at least one other Key Stage 2 teacher and the headteacher. The focus of the interviews was to understand school research cultures, teachers' approaches to using and conducting research, their understanding of its effect on their practice, and reasons for their use (or non-use) of research in their practice. In addition, the interviews in treatment schools addressed the ways in which teachers and schools engaged with the RLC and how Evidence Champions experienced the RLC workshops and operationalised their role within the school. In total, 26 teachers from six treatment schools and 10 teachers from two control schools were interviewed in the first year of the evaluation, and 20 teachers from five treatment schools and four teachers from one control school were interviewed in the second year of the evaluation.

Observations of RLC workshops (at least one from each of the eight rounds of workshops over the two years of the intervention) allowed us to understand Evidence Champions' participation in the RLCs and the dynamics of the workshops. They also provided a context for some of the case-study schools.

The survey of Evidence Champions included both open and closed questions about their engagement with research, their participation in the RLC workshops, their activities in school and with other schools as a result of the workshops, and their beliefs about the outcomes of the project. In total, 18 Evidence Champions from 14 schools responded to the survey in the first year of the evaluation, and 28 from 20 schools responded in the second year.

Fidelity was measured quantitatively by attendance at workshops (see 'on-treatment analysis' in the impact evaluation). This was collected by the delivery team at each workshop. Because of the large scale of the trial—and the range of different ways in which Evidence Champions might work to develop a research-oriented culture in their own school—it was not appropriate to use activities outside of RLC workshops as a measure of fidelity. Instead, observations of one or two of each round of workshops, case-study interviews, and Evidence Champion surveys aimed to understand the range of ways in which the delivery team worked with Evidence Champions, and Evidence Champions worked in their schools.

Costs

The cost of delivering the intervention to each RLC was provided by the delivery organisation. The evaluation team calculated the cost at £3.14 per child per year for a 3-year intervention.

Information about the amount of time spent in schools by Evidence Champions and other teachers engaging in research were collected through the process evaluation and discussion with the delivery team—although this varied very widely between schools including some schools that did not allocate any extra dedicated time beyond the workshops.

Timeline

Table 3: Timeline of the project

Date	Activity
June 2014–September 2014	Nationwide recruitment of participating schools by the intervention team, with support from the evaluation team at recruitment events.
June 2014–September 2014	Teacher baseline survey administration (as part of recruitment process) using baseline research-use questionnaire developed by NFER.
July 2014–September 2014	Collection of UPNs for 2014/2015 Year 5 cohort in participating schools, in class lists with teacher names.
September 2014	Allocation of schools to treatment and control groups, using minimisation.
October 2014	Evidence Champions suggested to schools by the project team, according to social network analysis for each school's staff team.
November 2014	Workshop 1, Year 1.
January 2015	Workshop 2, Year 1.
March 2015–April 2015	Workshop 3, Year 1.
March 2015–May 2015	Case study visits for process evaluation.
June 2015	Workshop 4, Year 1.
June 2015–October 2015	Teacher Survey round two administration using Research Use Questionnaire developed by NFER. Evidence Champion survey administration. Links were sent to schools in June 2015, with reminders by email and telephone in July, September, and October 2015. (The deadline was extended due to low response rates.)
September 2015–July 2016	Collection of UPIs for 2015/2016 Year 6 cohort in participating schools, in class lists with teacher names.
November 2015	Workshop 1, Year 2.
January 2016	Workshop 2, Year 2.
February 2016–March 2016	Parent opt-out consent letters sent to schools for distribution to parents.
March 2016-April 2016	Workshop 3, Year 2.
May 2016–September 2016	Case study visits for process evaluation.
June 2016	Workshop 4, Year 2.
June 2016–October 2016	Teacher Survey round three administration using Research Use Questionnaire developed by NFER. Evidence Champion survey administration. Links were sent to schools in June 2016, with reminders by email and telephone in July, September, and October 2016. (As in round two, the deadline was extended due to low response rates.)
July 2016–September 2016	Liaising with NPD to develop application for data.
September 2016	Application for NPD data.

October 2016–December 2016	Cleaning of teacher survey data. Development of statistical analysis plan. Analysis of process evaluation data.
January 2017–May 2017	Receipt of NPD data. Matching of NPD data to teacher survey data. Analysis of NPD data and teacher survey data. Analysis of process evaluation data. Synthesis of findings and report writing.

Impact evaluation

Participants

Figure 1: Participant flow diagram for primary outcome (KS2 reading)

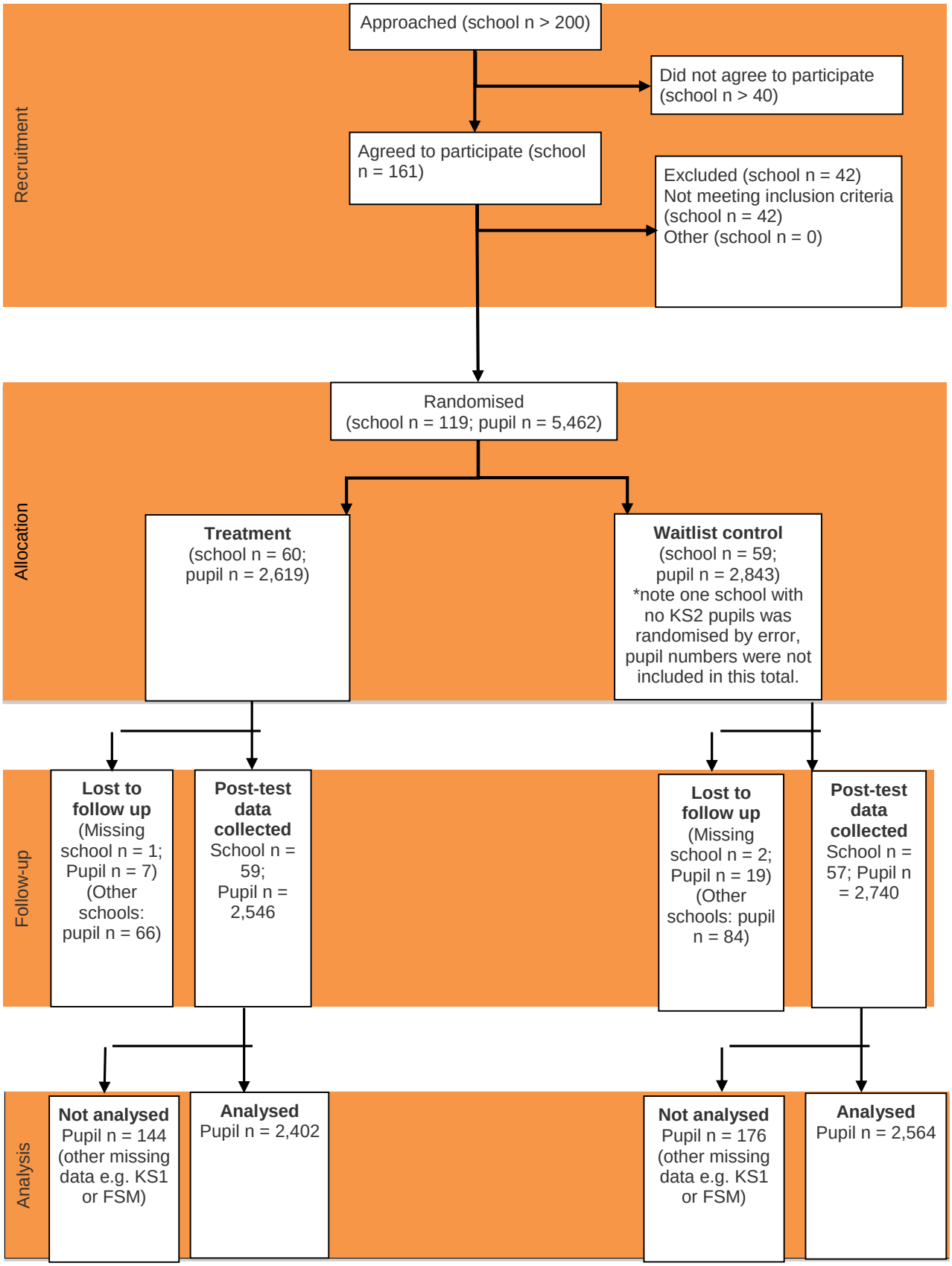

Table 4: Minimum detectable effect size for primary outcome of pupil attainment at different stages

Stage	N [schools] (n = intervention; n = control)	Correlation between pre-test (+other covariates) & post-test	ICC	Blocking/ stratification or pair matching	Power	Alpha	MDES
Protocol	110 (55; 55) OR 70 Units	0.73	0.2	Did not use in calculations	80%	0.05	0.16 OR 0.18
Randomisation	119 (60; 59) OR 71 Units	0.73	0.2	Did not use in calculations	80%	0.05	0.18
Analysis	116 (59; 57) OR 70 UNITS	0.63	0.11	Did not use in calculations	80%	0.05	0.17

While Figure 1 details the participant flow for the primary outcome, the details for the teacher outcomes and Part 2 of the pupil outcomes analysis (matching pupil outcomes to teacher outcomes) are presented below.

Treatment Schools

- Discontinued intervention at the start or partway through the project: school n = 4.
- Of the remaining schools (n = 56), 430 teachers in 54 schools completed the survey in round two, and 227 teachers in 39 schools completed the survey from round three.
- For teacher survey outcomes: not analysed, school, n = 21; teacher, n = 802; analysed: school, n = 39; teacher, n = 235.
- Received pupil UPNs: school, n = 55; pupil n = 2,599. This enabled us to access and match KS2 attainment data and teacher survey data for pupils for Part 2 of KS2 outcome analysis.
- Data on attendance at workshops is available for n = 43 schools. Other teacher attendance data is missing as this was not collected by UCL workshop leaders.

Control Schools

- Discontinued participation partway through the project: school n = 2.
- Of remaining schools (n = 57), 528 teachers in 49 schools completed the survey in round two, and 468 teachers in 41 schools completed the survey in round three.
- For teacher survey outcomes: not analysed, school, n = 19; teacher, n = 638; analysed: school, n = 40; teacher, n = 464.
- Received pupil UPNs: school, n= 53; pupil, n = 2,829. This enabled us to access and match KS2 attainment data and teacher survey data for pupils for Part 2 of KS2 outcome analysis.

Sample characteristics

Table 5 presents the comparison of school characteristics at baseline, and Tables G.5–G.7 in Appendix G present this comparison for those in the different analyses. Percentages are rounded to the nearest whole number so may not always sum to 100. Size of school, percentage of FSM eligibility, attainment at KS2, location, and school type are all taken at time of baseline. Percentages of pupils with EAL, with SEN, and who are boys, Ofsted ratings, and levels of FSM eligibility, are all from available 2016/2017 data for the schools. To check balance at baseline, t-tests were conducted on size of school, %FSM, %KS2 level 4, %EAL, %SEN, and %boys. None of the t-tests showed a significant difference between treatment and control groups:

- size of school: t(117) = 0.739, p = 0.461, hedges g = 0.14
- %FSM: t(117) = 0.443, p = 0.659, hedges g = 0.08
- %KS2 Level 4: t(117) = -1.589, p = 0.115, hedges g = 0.22
- %EAL: t(117) = -0.289, p = 0.773, hedges g = 0.05
- %SEN: t(117) = -0.013, p = 0.990, hedges g = 0.002
- %boys: t(117) = 0.711, p = 0.478, hedges g = 0.13

A comparison of pupil-level standardised KS1 results at baseline for Part 1 analysis showed no significant difference, with a negligible effect size:

- pupil-level KS1: t(5102) = 0.153, p = 0.878, hedges g = 0.043.

Missing data for the KS2 outcomes analysis (Part 1) is minimal because this data comes entirely from Year 5 intention to treat NPD records. Part 1 analysis is based on the full cohort of Year 5 KS2 students in the NPD for participating schools. NPD data was unavailable for three schools in the sample: two control schools and one treatment school. For two very small schools, the reason for the missing KS2 data is unclear. In the case of the third school, an infant school with no KS2 students was included by error in the original UCL list of potential schools to participate in the RLC project and was selected in the randomisation procedure as a control school, although no pupil numbers were included as randomised or as attrition due to the error (see Appendix G).

For the KS2 outcomes analysis, Part 2, the main source of missing data relates to missing Year 5 pupil UPNs and school engagement (measured through attendance at workshops) which cannot be imputed). There is also some missing teacher survey data (round two) and intervention dosage (number of workshops attended by evidence champion). Otherwise there is no significant missing data on key analysis variables (KS1 and KS2 pupil attainment, and FSM eligibility). Overall data was missing for between 15–37 schools for these analyses: 10–24 control schools and 5–13 intervention schools (see Appendix G).

For the teacher outcomes analysis, there is some missing data on teacher survey data (round three). For those teachers responding to the survey, there was no missing item data and thus no effect on the calculation of the six summary measures. Overall, data was missing for the teacher survey (round two) for 11 schools: seven control schools and four intervention schools, and for teacher survey (round three) for 40 schools: 19 control schools and 21 intervention schools (see Appendix G).

School characteristics for participating schools at different stages of the analysis can be seen in Table G.5–G.7 in Appendix G. In order to check the sensitivity of the findings to the extent of missing data (the potential impact of missing values on the comparison between intervention and control schools) the balance at different stages of analysis was also examined. T-tests were conducted on size of school, %FSM, %KS2 level 4, %EAL, %SEN, and %boys. None of the t-tests showed a significant difference between intervention and control groups, except that there is a marginally significant difference between control and treatment schools for Part 1 analysis in terms of school-level KS2 attainment (% achieving level 4 at KS2) at baseline, with a small effect size of 0.37, and there is a significant difference between

control and treatment schools for Teacher Survey round three analysis in terms of size of school, with a medium effect size of 0.55. These findings indicate that, overall, in spite of reductions in the sample size for different analyses, the balance between intervention and control school in a range of school characteristics remained almost entirely consistent.

This sample has larger schools than the national average for primary schools (279). Also, compared to national averages, a higher percentage of FSM pupils (14.1%), EAL pupils (20.6%), and pupils reaching level 4 in KS2 reading, writing and mathematics (53%). (Average figures, DfE, 2016, 2017.)

Table 5: Baseline comparison of school data

Variable School-level (continuous)	Intervention group n/N (missing)	 Mean	Control group n/N (missing)	 Mean
Size of school (number of pupils)	60/60 (0)	319.2	59/59 (0)	341.1
% FSM eligibility	60/60 (0)	20.7%	59/59 (0)	22.0%
Attainment at KS2 (% achieving level 4 in reading, writing and maths)	60/60 (0)	79.3%	59/59 (0)	75.8%
% Pupils with English as an Additional Language (EAL)	60/60 (0)	25.9%	59/59 (0)	24.5%
% Pupils with SEN	60/60 (0)	3.2%	59/59 (0)	3.2%
% Boys	60/60 (0)	50.9%	59/59 (0)	51.6%
Pupil-level attainment at KS1 (standardised)	2,454/2,454 (0)	0.0100	2,650/2,650 (0)	0.0143
School-level (categorical)	**n/N (missing)**	**Percentage**	**n/N (missing)**	**Percentage**
Ofsted Rating	46/60 (14)	77%	46/59 (13)	78%
Outstanding	9/60 (0)	15%	11/59 (0)	19%
Good	36/60 (0)	60%	33/59 (0)	56%
Requires Improvement	1/60 (0)	2%	2/59 (0)	3%
Inadequate	0/60 (0)	0%	0/59 (0)	0%
None	14/60 (0)	23%	13/59 (0)	22%
School Location				
Urban	50/60 (0)	83%	52/59 (0)	88%
Rural	10/60 (0)	17%	7/59 (0)	12%
FSM eligibility				
High (> 35%)	13/60 (0)	22%	11/59 (0)	19%
Medium (20.1%–35%)	8/60 (0)	13%	14/59 (0)	24%
Low (< 20.1%)	39/60 (0)	65%	34/59 (0)	58%
School Type				
Academy—Converter Mainstream	9/60 (0)	15%	5/59 (0)	8%
Academy—Sponsor Led Mainstream	5/60 (0)	8%	9/59 (0)	15%
Community	33/60 (0)	55%	30/59 (0)	51%
Community Special	0/60 (0)	0%	1/59 (0)	2%
Foundation	1/60 (0)	2%	1/59 (0)	2%
Foundation Special	1/60 (0)	2%	0/59 (0)	0%
Voluntary Aided	10/60 (0)	17%	8/59 (0)	14%
Voluntary Controlled	1/60 (0)	2%	5/59 (0)	8%

Outcomes and analysis

Summary tables of the multilevel modelling results are presented below and the specific model results are presented in Appendix H.

Student outcomes Part 1 analyses

Tables 6 and 7 show the overall impact on pupils' KS2 attainment of the RLC intervention. The basic unit of analysis is pupils (clustered within schools). It was found that there is no statistically significant difference (the effect size is low, at < 0.2) between intervention and control schools in KS2 pupil outcomes (primary and secondary), either for all pupils or for pupil subgroups (FSM, RLCs with literacy focus, RLCs with numeracy focus).

Table 6: Primary outcome analysis

	Raw means						
	Intervention group		Control group				
Outcome (standardised)	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	n in model (intervention ; control)	Effect size (Confidence Interval)	p-value
KS2 reading	2,546 (73)	0.02 (-0.02, 0.06)	2,740 (103)	-0.02 (-0.06, 0.01)	4,966 (2,402; 2564)	0.02 (-0.09, 0.12)	0.74
KS2 reading (FSM pupils)	898 (40)	-0.29 (-0.35, -0.23)	969 (40)	-0.28 (-0.34, -0.22)	1724 (822; 902)	0.04 (-0.06, 0.12)	0.52
KS2 reading (schools with a literacy focus to the intervention in Y1 vs control)	2,257 (69)	0.07 (0.02, 0.11)	2,740 (103)	-0.02 (-0.06, 0.01)	4697 (2,133; 2,564)	0.09 (-0.07, 0.20)	0.68
KS2 reading (schools with a numeracy focus to the intervention in Y1 vs control)	289 (4)	-0.30 (-0.43, -0.17)	2,740 (103)	-0.02 (-0.06, 0.01)	2,833 (269; 2,564)	-0.01 (-0.24, 0.08)	0.91

Note: The effect sizes were estimated after controlling for prior attainment and everFSM, intervention and randomisation control variables.

Table 7: Secondary outcome analysis

	Raw means						
	Intervention group		Control group				
Outcome (standardised)	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	n in model (intervention; control)	Effect size (CI)	p-value
KS2 grammar, punctuation and spelling	2,560 (59)	0.03 (0.01, 0.07)	2,765 (78)	-0.03 (0.07, 0.01)	4,997 (2,412; 2,585)	0.10 (-0.06, 0.20)	0.27
KS2 grammar, punctuation and spelling (FSM pupils)	866 (32)	-0.21 (-0.28, -0.15)	941 (28)	-0.30 (-0.36, -0.23)	1742 (829; 913)	0.09 (-0.02, 0.14)	0.14
KS2 grammar, punctuation and spelling (schools with a literacy focus to the intervention in Y1)	2,268 (58)	0.07 (0.03, 0.11)	2,765 (78)	-0.03 (0.07, 0.01)	4,727 (2,142; 2,585)	0.09 (-0.07, 0.20)	0.35
KS2 grammar, punctuation and spelling schools with a numeracy focus to the intervention in Y1)	292 (1)	-0.24 (-0.37, -0.11)	2,765 (78)	-0.03 (0.07, 0.01)	2,855 (270; 2,585)	0.15 (-0.15, 0.36)	0.41
KS2 numeracy	2,560 (59)	0.01 (-0.03, 0.05)	2771 (72)	-0.01 (-0.05, 0.03)	5,000 2,412; 2,588)	0.06 (-0.08, 0.16)	0.54
KS2 numeracy (FSM pupils)	866 (32)	-0.26 (-0.32, -0.19)	945 (24)	-0.23 (-0.30, -0.17)	1,745 (830; 915)	-0.03 (-0.10, 0.07)	0.68
KS2 numeracy (schools with a literacy focus to the intervention in Y1)	2268 (58)	0.04 (0.00, 0.08)	2,771 (72)	-0.01 (-0.05, 0.03)	4,730 (2,142; 2,588)	0.04 (-0.10, 0.16)	0.66
KS2 numeracy (schools with a numeracy focus to the intervention in Y1)	292 (1)	-0.23 (-0.37, -0.10)	2,771 (72)	-0.01 (-0.05, 0.03)	2,858 (270; 2,588)	0.12 (-0.15, 0.34)	0.46

Note: The effect sizes were estimated after controlling for prior attainment and everFSM, intervention and randomisation control variables.

Student outcomes Part 2 analyses

Tables 8 and 9 show more sensitive analyses of the impact on pupils KS2 attainment of the RLC intervention dosage and KS2 (Year 5/6) teachers' research use to inform their practice (measures 1 and 2, Teacher Survey round two) as outlined in the SAP. The basic unit of analysis is pupils (clustered within schools). KS2 pupil records were matched via UPNs provided by schools to the teacher (round two) survey results of their KS2 (Year 5/6) teacher. Due to missing UPN and teacher survey data this resulted in a smaller sample size than Part 1 analyses (see Appendix G). The results for KS2 Teacher Survey (round two), measures 3–6, were not found to be statistically significant for any KS2 outcome but are presented for information in Appendix H (Tables H.6–H.8). Overall, it was found that:

- For KS2 reading there is no statistically significant impact of RLC intervention dosage (effect size = 0.01) or Teacher Research Use Survey (round two) measure 1 (effect size = -0.003) and measure 2 (effect size = 0.06).
- For KS2 grammar, punctuation, and spelling there is no statistically significant impact of RLC dosage (effect size = 0.02). However, there is a statistically significant impact of Teacher Research Use Survey (round two) measure 1 (effect size = 0.07) and measure 2 (effect size = 0.09). This suggests the more KS2 (Year 5/6) teachers report using research evidence to inform their practice, the higher are their pupils' KS2 grammar, punctuation and spelling scores, irrespective of whether they teach in an intervention or control school.
- For KS2 numeracy there is no statistically significant impact of RLC intervention dosage (effect size = 0.01) or Teacher Research Use survey (round two) measures 1 (effect size = 0.05). However, there is a statistically significant impact of Teacher Research Use survey (round two) measure 2 (effect size = 0.08). This suggests the more KS2 (Year 5/6) teachers report using research evidence to inform their practice, the higher their pupils KS2 numeracy score, irrespective of whether they teach in an intervention or control school.

Table 8: Impact of Teacher Survey (round two) research use in school, measure 1 and 2 analysis on KS2 outcomes

Pupil Outcome	Teacher research use in school	N in model	Effect size (95% CI)	P-value
KS2 reading (primary outcome)	Measure 1 (positive disposition to academic research in informing teaching practice)	2,871	-0.003 (-0.05, 0.04)	0.92
	Measure 2 (use of academic research to inform selection of teaching approaches)	2,871	0.06 (-0.01, 0.08)	0.10
KS2 grammar, punctuation, and spelling	Measure 1 (positive disposition to academic research in informing teaching practice)	2,886	0.07 (0.01, 0.09)	0.02
	Measure 2 (use of academic research to inform selection of teaching approaches)	2,886	0.09 (0.01, 0.10)	0.01
KS2 numeracy	Measure 1 (positive disposition to academic research in informing teaching practice)	2,886	0.05 (-0.002, 0.08)	0.07
	Measure 2 (use of academic research to inform selection of teaching approaches)	2,886	0.08 (0.01, 011)	0.01

Note: The effect sizes of measures 1 and 2 were estimated after controlling for prior attainment and everFSM. Randomisation control variables were not included in this analysis as it was not required given intervention dummy variable was not included (due to overlap/confounding with teacher survey research use variables).

Table 9: Impact of on-treatment (intervention dosage) analysis on KS2 outcomes

Pupil outcome	Intervention dosage	N in model (intervention; control)	Number of schools in model (intervention; control)	Effect size (95% CI)	P-value
KS2 reading (primary outcome)	intervention dosage (number of RLC workshops attended)	4,131 (2,025; 2,106)	104 (55; 49)	0.01 (-0.00, 0.01)	0.14
KS2 grammar, punctuation, and spelling	intervention dosage (number of RLC workshops attended)	4,153 (2,033; 2,120)	104 (55; 49)	0.02 (-0.01, 0.02)	0.07
KS2 numeracy	intervention dosage (number of RLC workshops attended)	4,152 (2,033; 2,120)	104 (55; 49)	0.01 (-0.00, 0.02)	0.15

Note: the effect sizes of intervention dosage were estimated after controlling for prior attainment, everFSM, and randomisation control variables.

Table 10 shows the overall impact of the RLC intervention on all KS2/KS2 teacher outcomes evaluated in terms of six measures created from the Teacher Research Use Survey at the end of the intervention (round three). The basic unit of analysis is KS2 /KS2 teachers (clustered with schools). It was found that there is a statistically significant difference between intervention and control schools in two teacher outcomes (measures 1 and 2) but not in the other four measures (measures 3–6), although analysis of the difference between intervention and control schools approaches statistical significance. The effect sizes were 0.21 and 0.20 for measures 1 and 2, respectively and between 0.12 and -0.17 for the other measures, 3–6. This indicates that at the end of the intervention (round three), teachers in intervention schools typically report a higher use of research evidence to inform their practice, in comparison to teachers in control schools. (See also ANOVA results below.)

Table 10: Teacher outcome (round three) analysis

Teacher outcome (round three)	N in model (intervention; control)	Effect size (95% CI)	P-value
Measure 1 (positive disposition to academic research in informing teaching practice)	699 (235; 464)	0.21 (0.02, 0.39)	0.03
Measure 2 (use of academic research to inform selection of teaching approaches)	699 (235; 464)	0.20 (0.00, 0.39)	0.05
Measure 3 (perception that academic research is not useful to teaching)	699 (235; 464)	-0.17 (-0.35, 0.01)	0.06
Measure 4 (perception that own school does not encourage use of academic research)	699 (235; 464)	-0.11 (-0.32, 0.10)	0.32
Measure 5 (active engagement with online evidence platforms)	699 (235; 464)	0.12 (-0.12, 0.23)	0.18
Measure 6 (knowledge of research findings and methods)	699 (235; 464)	0.005 (-0.18, 0.19)	0.96

Note: The effect sizes were estimated after controlling for intervention and randomisation control variables.

Further analyses were also conducted to test the association of teacher background variables from the teacher survey to teachers' research use outcome variables, having already controlled for intervention/control group and randomisation variables. (The teacher background variables are detailed on page 15.) The cross-tabulation tables of these variables by intervention/control can be seen in Table G7.8–G7.11 in Appendix G. This approach was helpful to explore whether certain teacher characteristics also play a role promoting teachers research use, over and above the RLC intervention. The findings showed a statistically significant association of some categories of teacher status (in comparison to classroom teacher) and more positive reports of teachers research use. Irrespective of whether in an RLC intervention or control school:

- headteachers responded more positively in all six measures;
- senior leaders responded more positively in all measures except measure 2 (use of academic research to inform selection of teaching approaches) and measure 4 (perception that own school does not encourage use of academic research); and
- middle leaders responded more positively in all measures except measure 4 and measure 6 (knowledge of research findings and methods).

Moreover, irrespective of whether in an intervention or control school, teachers holding a postgraduate qualification also responded statistically significantly more positively on measure 1 (positive disposition to academic research in informing teaching practice) and measure 6. Finally, years of teaching in current school was found to have a small statistically significant association: teachers who had taught longer in their current school were more likely to respond negatively on research use measure 4 and measure 6. (See table 10b and Appendix H for full details of the results.) Importantly, having controlled for these teacher background characteristics, the association of the RLC intervention became non-significant for all 6 teacher research-use measures. This suggests that teacher characteristics such as leadership status and holding a postgraduate qualification are more important in promoting teachers research use than participating in the RLC intervention. Note that we also explored whether this result would change if interactions between intervention/control group and teacher characteristics were

additionally controlled for in the analysis, in other words, whether senior or better qualified teachers in the intervention schools may have responded more positively than those in control schools. However, this was not found to be the case.

Table 10b Multilevel modeling results for part 2 (teacher outcome analysis for measure 1: Positive disposition to academic research in informing teaching practice)

	(1) Standardized measure1 score		(2) Standardized measure1 score		(3) Standardized measure1 score	
Fixed Part:						
Treatment			0.21*	(0.10)	0.14	(0.09)
School FSM%			-0.08	(0.10)	-0.06	(0.10)
School average KS2 score			0.16	(0.11)	0.14	(0.10)
school size small			ref.		ref.	
school size medium			-0.03	(0.13)	0.01	(0.13)
school size large			-0.04	(0.14)	0.04	(0.13)
Classroom teacher					ref.	
Middle leader (e.g. head of department, subject or curriculum area leader)					0.34***	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					0.58***	(0.13)
Headteacher, principal or director					1.10***	(0.21)
SEN teacher					0.39	(0.42)
Supply, cover or PPA teacher					0.15	(0.25)
High level teaching assistant					0.86	(0.47)
Music or PE extra curricula teacher					-0.07	(0.47)
with postgraduate qualifications					0.47***	(0.13)

year of teaching					0.02	(0.04)
year of teaching in the school					-0.03	(0.04)
Constant	0.00	(0.05)	-0.12	(0.15)	-0.48*	(0.23)
Random Part:						
School: variance	0.05***	(0.03)	0.03***	(0.02)	0.03***	(0.02)
Student: variance	0.94	(0.05)	0.95	(0.05)	0.84**	(0.05)
groups	79		79		79	
N	699		699		699	
Deviance	1974.12		1963.08		1884.70	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11 shows the numbers of responses to the Teacher Research Use Survey in intervention and control schools in round two and round three. Tables 12 to 17 show the typical change in a school's average teacher-reported use of research evidence to inform their practice between the end of the first year (round two) and the end of second year (round three) of the intervention. The unit of analysis is schools and in each case a two-way ANOVA was used (intervention/control and round two/round three). It should also be reiterated that the reliability for the teacher survey measures was relatively low except for measure 1 (positive disposition to academic research in informing teaching practice; see Table 2). It was found, for intervention schools but not for control schools, that there were noticeable differences between rounds two and three of the survey for five of the teacher measures. Teacher measures, on average, in intervention schools increased for positively worded measures (1, 2, and 5) and decreased for negatively worded measures (3 and 4) between the end of the first year (2015, round two) and the end of second year (2016, round three) of the intervention. In contrast, average teacher measures in control schools typically did not change between rounds two and three. These changes between the end of the first year and the end of the second year, however, were not statistically significant in the ANOVA analysis due to the relatively small number of schools.

Table 11: Number of respondents and schools in the Teacher Survey by intervention/control and round two/round three

Count: number of respondents/schools in teacher survey		
	Round 2	**Round 3**
Intervention	441/56	235/39
Control	525/52	464/40
Total	966/108	699/79

Table 12: School means of teacher responses for Measure 1 (by intervention/control and round two/round three) and two-way ANOVA results4 for testing the differences between school means of Measure 1

Measure 1 (positive disposition to academic research in informing teaching practice): School means			
	Round 2	**Round 3**	**Total**
Intervention	0.04	0.15	0.08
Control	-0.04	-0.08	-0.05
Total	-0.001	-0.0002	

Note:

- there is no statistically significant difference in school means of Measure 1 between round two and round three surveys ($p = 0.67$);
- there is a statistically significant difference in school means of Measure 1 between intervention and control groups ($p = 0.05$);
- the interaction term of the two factors (intervention/control; round two/round three) has no significant effect on school means of Measure 1 ($p = 0.26$); and
- the three random randomisation variables were also controlled in ANOVA.

[4] In Tables 12–17, the calculation of means in each cell and two-way ANOVA were based on the average school scores for Measures 1–6. The school means were weighted by using the Analytic weights (file:///O:/using-weights-in-stata(1).pdf) in both calculation of means and two-way ANOVA analysis to adjust the bias caused by unequal respondents in different schools.

Table 13: School means of teacher responses for Measure 2 (by intervention/control and round two/round three) and two-way ANOVA results for testing the differences between school means of Measure 2

Measure 2 (use of academic research to inform selection of teaching approaches): School means			
	Round 2	**Round 3**	**Total**
Intervention	0.04	0.15	0.08
Control	-0.04	-0.07	-0.05
Total	0.001	0.002	

Note:

- there is no statistically significant difference in school means of Measure 2 between round two and round three (p = 0.68);
- there is no statistically significant difference in school means of Measure 2 between intervention and control group (p = 0.09);
- the interaction term of the two factors (intervention/control; round two/round three) also has no significant effect on school means of Measure 2 (p = 0.28); and
- the three random randomisation variables were also controlled in ANOVA.

Table 14: School means of teacher responses for Measure 3 (by intervention/control and round two/round three) and two-way ANOVA results for testing the differences between school means of Measure 3

Measure 3 (perception that academic research is not useful to teaching): School means			
	Round 2	**Round 3**	**Total**
Intervention	-0.03	-0.10	-0.05
Control	0.02	0.05	0.04
Total	0.005	-0.001	

Note:

- there is no statistically significant difference in school means of Measure 3 between round two and round three survey (p = 0.70);
- there is no statistically significant difference in school means of Measure 3 between intervention and control group (p = 0.07);
- the interaction term of the two factors (intervention/control; round two/round three) also has no significant effect on school means of Measure 3 (p = 0.31); and
- the three random randomisation variables were also controlled in ANOVA.

Table 15: School means of teacher responses for Measure 4 (by intervention/control and round two/round three) and two-way ANOVA results for testing the differences between school means of Measure 4

Measure 4 (perception that own school does not encourage use of academic research): School means			
	Round 2	Round 3	Total
Intervention	-0.01	-0.09	-0.04

Control	0.01	0.04	0.03
Total	0.001	0.0007	

Note:

- there is no statistically significant difference in school means of Measure 4 between round two and round three survey (p = 0.87);
- there is no statistically significant difference in school means of Measure 4 between intervention and control group (p = 0.45);
- the interaction term of the two factors (intervention/control; round two/round three) also has no significant effect on school means of Measure 4 (p = 0.41); and
- the three random randomisation variables were also controlled in ANOVA.

Table 16: School means of teacher responses for Measure 5 (by intervention/control and round two/round three) and two-way ANOVA results for testing the differences between school means of Measure 5

Measure 5 (active engagement with online evidence platforms): School means			
	Round 2	Round 3	Total
Intervention	-0.03	0.07	0.005
Control	0.03	-0.04	-0.003
Total	0.004	-0.002	

Note:

- there is no statistically significant difference in school means of Measure 5 between round two and round three survey (p = 0.74);
- there is no statistically significant difference in school means of Measure 5 between intervention and control group (p = 0.64);
- the interaction term of the two factors (intervention/control; round two/round three) also has no significant effect on school means of Measure 5 (p = 0.11); and
- the three random randomisation variables were also controlled in ANOVA.

Table 17: School means of teacher responses for Measure 6 (by intervention/control and round two/round three) and two-way ANOVA results for testing the differences between school means of Measure 6

Measure 6 (knowledge of research findings and methods): School means			
	Round 2	Round 3	Total
Intervention	0.09	0.02	0.07
Control	-0.08	-0.01	-0.05
Total	0.001	-0.0002	

Note:

- there is no statistically significant difference in school means of Measure 6 between round two and round three survey ($p = 0.88$);
- there is no statistically significant difference in school means of Measure 6 between intervention and control group ($p = 0.20$);
- the interaction term of the two factors (intervention/control; round two/round three) has no significant effect on school means of Measure 6 ($p = 0.23$); and
- the three random randomisation variables were also controlled in ANOVA.

Cost

To buy in, an RLC over a year would cost £500 per day over six days, plus an average of £600 for travel and resources—a total of £3,600 for each RLC per year to be divided between the schools in the RLC. Social network analysis to determine who would be appropriate Evidence Champions was calculated as five days per RLC, at £500 per day, as a one-off cost to the RLC at the start of the intervention. Based on 14 RLCs across 59 schools, and a total of 19,158 children across all year groups in the schools, the cost per child is £3.24 per year for a three-year intervention (Table 18).

Table 18: Cost of the intervention

Item	Type of cost	Cost	Total cost over 3 years	Total cost per pupil per year over 3 years
One-off social network analysis	Start-up cost per RLC	£2,500 per RLC	£2,500 per RLC	
One year of RLC workshops	Running cost per RLC	£3,600 per RLC	£10,800 per RLC	
Total			£13,300 per RLC	£3.24

Each Evidence Champion (two per school) would be expected to attend four day-long workshops per year. The amount of time spent by Evidence Champions and other teachers engaging with research was determined by their school, and different schools approached this differently. In the majority of schools, teachers were expected to do this in addition to their normal timetables—few schools allocated extra time to Evidence Champions. Some schools allocated time in staff meetings to discuss the RLC project and activities, others did not.

Schools in the evaluation received the intervention for free as the cost was borne by EEF.

Process evaluation

This section reports on findings from case studies of six treatment schools and two control schools, information gathered from the Evidence Champion surveys at the end of Year 1 and the end of Year 2 of the intervention, and information gathered from visits to the RLC workshops. Interviews in case study schools and Evidence Champion surveys enabled us to understand the ways in which the intervention was experienced by teachers, and how teachers and schools aim to use research evidence to inform practice.

Discussions with the intervention team and attendance at workshops enabled the evaluation team to understand the content of the training. During the first year of the project this centred on issues such as:

- looking at research on a given subject area;
- understanding effective ways to share research;
- understanding what baseline data is and how to collect it;
- analysing data;
- developing and trialling new approaches to teaching and learning that build on data;
- looking at research on how to lead and manage change;
- using Guskey's (2000) model to understand how to think about, and measure, impact (this model proposes five levels of understanding professional development; participants' reactions and participants' learning; organisation support and change; participants' use of new knowledge and skills; and student learning outcomes);
- understanding theories of action and how these can be used to think about and implement change;
- understanding how to assess impact;
- effective ways of mobilising knowledge within and across schools; and
- how to source high quality literature.

Training during the second year of the project was more 'light touch' and centred on issues such as determining the focus of inquiry and desired outcomes, deciding on and analysing baseline data, determining potential actions, developing a roll-out plan, identifying measures of impact, analysing impact, and reflecting on ways forward.

From the information gathered through the Evidence Champion survey, attendance at workshops was good, particularly in the first year. Most participants from this sample said they had been to either three or four sessions. Absences were mostly due to time constraints. According to interviewees, schools tried to ensure that at least one Evidence Champion or senior leader attended every workshop.

In both years, workshops were very well received by participants: all of them deemed 'very useful', both by a majority of interviewees and by Evidence Champion survey respondents. In interviews, beyond the interest and usefulness of their topics, participants stressed they valued the workshops largely for the opportunity these afforded to meet teachers from other schools, share ideas, and reflect together about their practices. In this sense, training workshops effectively functioned as research learning communities, supporting the work done by the Evidence Champions in their respective schools, and promoting collaboration and reflection among colleagues.

The choice of facilitators was crucial for the success of the workshops: in interviews, they were invariably well evaluated by participants, not just for the delivery of the sessions, but also for maintaining a line of communication (through phone and email) with the schools for the whole duration of the project:

> *'A lot of emails and communication, [the facilitator] was lovely with support if we needed anything'* (teacher interview, School H, 2016).

By giving advice, access to resources, and helping with the structuring of the interventions, facilitators were considered supportive and helpful, ensuring the continuity of the project in the schools that were taking part.

Implementation

Attendance by the evaluation team at a selection of RLC workshops suggested that they were run according to the planned agenda. Inevitably conversations took different turns within each workshop, and different participants responded differently to the content. This is an inherent part of running professional development sessions that aim to promote engagement with tools (in this case, research) and reflection on practice.

Among the factors that were seen as relevant to the success of the project by interviewees, the most important was that schools already had a 'research-friendly' culture, as described by the headteacher in School A in 2015:

> *'That's why it was useful using the staff meetings in that way, to say, "Well, let's all come with the piece of research," and you'd look very silly if you turned up with nothing and everyone else is having the discussions. And there were some people who'd made more effort than others, and that's a good model then for the people who'd perhaps not made as much effort to see what the others had done.'*

Prior to their participation in the RLC project, treatment case study schools showed varying levels of engagement with research. No school seemed to normally use published research to systematically inform teaching (beyond training events and INSET days). However, periodical revision of pupil data to monitor attainment, trialling new pedagogical approaches, and diverse forms of collaboration with other schools were repeatedly mentioned as common practices. These could be characteristic of a positive attitude towards the analysis and discussion of evidence, with collaboration with other schools being used as a means to share and discuss evidence. In this sense, according to interviewees, the RLC project confirmed, validated, reinforced, or enhanced the learning culture of these institutions.

Interviewees suggested that other factors that helped the workings of the project were:

- the existence of effective communication mechanisms among teachers and leadership team—regular staff meetings in particular;
- the adoption of a 'participatory' approach, respecting the teachers' autonomy to manage their interventions;
- a proactive staff, keen on trying initiatives to improve learning;
- the size of the school (smaller institutions facilitated communication and the adoption of a whole-school approach to the project); and
- continued support from the Institute of Education via workshop facilitators.

Given the enthusiasm of schools to sign up to the project in the first place and the nature of the interviews, it appears that the intervention is very attractive to schools, especially those that already work together and so have existing collaborative systems. The intervention has the potential to effect considerable change for those who are Evidence Champions: workshop attendance and interviews over the two years of the project evidenced a shift in approach and increased confidence in using research to inform practice, and in discussing this with colleagues:

> *'Definitely, the peer and self-assessment is definitely having an impact. At the start of the year they would just have absolutely no clue, you know, "oh, well done, you've done really nice hand*

> *writing, now you need to look at adding adjectives", where they probably used hundreds of adjectives in their piece of work. And then, […] each staff meeting, [the Evidence Champions] have done, they've kind of given us a new [ideas], so first it was to like model how to give peer assessment, and then it was to show them some good and bad examples of it and then talk about why those examples were good or were bad. And now I feel at the end of the year that the children really, you know, what they're looking for and how to give good feedback on their work here'* (teacher, School E, 2016).

According to all interviewees, the biggest difficulty faced when implementing the project was the lack of time to engage with research given day-to-day teacher workloads, for example:

> *'Time… and it is very difficult to improve that. We are working our socks off as it is without doing anything additional, so obviously all of this is extra on top of what everyone, the Champions, the people on the ground, it is all additional. So you are relying very much on goodwill, of people giving up their time outside of what they are doing. Obviously as a teacher, you would hope that most people are reflective on ways to improve their practice but I think as a member of SLT, it is really important not to lose sight of the fact that you are already making a lot of demands on your teachers. And so it is about keeping that balance healthy, between what you are asking them to do in addition to what they are already doing'* (Evidence Champion, School G, 2015).

This was particularly dramatic for Year 6 teachers (some Evidence Champions among them), busy with the preparation of SATs and other end-of-KS2 activities, but the issue was raised by every teacher interviewed, regardless of his or her year group. This meant that the project worked better in schools where there were already instances (like regular staff meetings) and practices (collaboration, revision of pupil data, class interventions) whereby project activities could be channelled, without adding too many extra demands on teachers. Most teachers needed to perceive an added value or a concrete impact of this project before considering finding time for it within their regular working schedule.

Moreover, a few schools went through Ofsted inspections during the implementation of the project, having to prioritise accountability activities over pedagogical development. Similarly, some interviewees claimed that the government's changing educational policies pressured them to focus on short-term initiatives, distracting them from developing a professional culture in their schools.

High staff turnover was another problem that affected some schools, impairing the continuity and stability of the project. This was evident in case study schools, and through visits to the workshops where non-case study schools were also in attendance. In some cases this was because of maternity or sick leave, or increased in-school responsibilities, as highlighted by a teacher in School C in 2016:

> *'It's just the time restraints and obviously being out of class for a whole day is not ideal when you're in teaching and when you're in class, especially in Year 6, which is why I had to drop out of it this year because I couldn't afford to spend time away from the children.'*

Other teachers moved to other jobs. This is a common situation in schools that calls for a sensible choice of Evidence Champions and early engagement of the whole staff.

Varying levels of prior engagement with research meant some teachers in case study schools had inadequate skills or experience in order to deal with their interventions, needing extra support from Evidence Champions or colleagues, and slowing down the implementation of the project. Both Evidence Champion surveys and case studies revealed that the lack of open access to relevant, up-to-date research in most schools is a barrier to the development of the project, as many participants had to rely informally on colleagues doing university courses, or used non-academic sources to obtain information to feed their interventions. It was suggested that school subscriptions to research databases could boost the effectiveness of a project of these characteristics, although time and training in how to use these resources may be needed, particularly for those school staff who have not recently attended university.

One question explored by the process evaluation was whether the duration of the intervention was appropriate. It was apparent that two years are needed for teachers to develop their understanding and practice of engaging with, and using, research, for example:

> *'I think they're [the RLCs] better for two years. I think you always want to… because you want to have that research element. So it's not only reading something, it's how you then apply that reading to your situation. And I think you need to be able to explain it convincingly to the rest of the staff, that something is worth having a go at. And so, I think it does take the two years to have the first trial on a small scale, and then the second year, implement it out. And then, only after that second year can you really see if anything's happening'* (Evidence Champion, School E, 2016).

> *'We were saying, and agreeing, that to do a project and research the impact, you need to have more time, yeah. In a year, you're almost introducing things or applying things. In the second year, you're almost consolidating some of the things and seeing the impact. And I think that's why I want to continue on for the following year, so that's two years for me in my year group. Although it's been two years within the school, but that's in different year groups. I think two years in year 2, would be much for me, something I just want to continue on, yeah'* (Evidence Champion, School C, 2016).

Further, the interviews during the second year of the research demonstrated a more reflective approach to research than those in the first year.

Fidelity

Interview and observation evidence from case-study visits indicates that the intervention was delivered as intended, although not all schools were able to attend all workshops due to time constraints, as mentioned above. Furthermore, staff turnover (evidenced in surveys, interviews, and attendance by the evaluation team at workshops) means that the Evidence Champion role may be played by different people over the course of two years, which may hinder the development of research expertise in a school. Data on workshop attendance for 45 schools (including one that dropped out before the start of the intervention and one that dropped out part way through) across ten RLCs were provided by the intervention team (see Table 19), with incomplete or no data being provided for four RLCs.

Table 19: Number of schools attending different numbers of workshops (note that one school dropped out before workshops started)

Number of workshops attended	5	6	7	8
Number of schools attending this many workshops	2	2	6	34

Of the records available across all RLCs, 300 workshop attendances involved two staff members, and 79 workshop attendances involved one staff member. This indicates that the majority of schools sent two staff members to a workshop the majority of times, but this was by no means universal.

Outcomes

Many case study participants claimed that they perceived an impact in the classroom (that is, in children's learning) where interventions were implemented, for example:

> *'The children are a lot more… they know when they've done something well and they can tell you when they've done something well and they're a lot more receptive to ways to improve now, and*

> *can, and Key Stage 2 or Key Stage 1 are able to identify what they need to be doing next to make it even better. And I think it's developed, like the school is developing a school ethos of like continuously growing and thinking about what they can do to make it even better'* (teacher, School E, 2016).

The effect of the RLC project is, however, mostly evident in the positive attitude and improved engagement with research that participants showed in interviews and Evidence Champion surveys. Several participants declared a greater interest in using published research to support classroom interventions or broaden their understanding of their practice. Among different research-related practices, reading papers from academic journals, and discussing them with colleagues, had become more common in some schools:

> *'If you read a journal article and then, two weeks later, do something related to it, it's not going to have the impact that you want. So it's important to read that article, digest it, think about what you want to take from it all the time, rather than just read it and put it to one side. And that's what we've been doing with this project, making sure we're reading and we're taking bits from it so that we can use it because otherwise, if you're not, it's just a waste of time, really. You need to make sure that you are benefiting from that research and that, ultimately, the children will benefit as well'* (teacher, School A, 2015).

Participants also suggested they now approach these texts more critically, considering the reliability of the sources, methodologies, and relevance for their own teaching.

In a similar vein, other participants claimed the project had made them more reflective about teaching and more aware of their professional development. Engaging with research was seen as a part of striving for improvement in teaching and learning. Some suggested they are keener now on collecting evidence of the effects of their initiatives and adopting more formal procedures for trialling new approaches in the classroom, time permitting.

> *'It's nice that colleagues do work amongst themselves so I know that with the Research Learning Communities you have four [members of staff] who have worked really closely together at looking and analysing about analysing about the Talk for Writing and scaffolding of learning, especially with that particular cohort, I think it's something that's probably really benefitted them in terms of that great depth of thinking and in terms of their delivery of the English curriculum—which has obviously been informed by research because that kind of forms part of the Research Learning Communities, so the fact that a teacher who isn't involved in that project has managed to get the benefits of working with a colleague that has, I think has probably had a great impact on that curriculum up there'* (headteacher, School G, 2016).

This quote also highlights the importance of sharing ideas with colleagues and developing a culture of collaboration. In interviews, this was often mentioned as an effect of the project: having established or reinforced instances of discussion among teachers, both within and between schools (in institutions that are members of school federations, for example). Given time constraints around implementing classroom interventions on a wider scale, cementing at least a culture of discussion and reflection with colleagues, oriented to pedagogical improvement and professional growth, is one of the most valued outcomes of the project.

All these attitudes imply a positive approach towards, and understanding of, how research can inform educational practice. Whatever their level of prior acquaintance with research practices, it can be inferred from interviews that the project strengthened—among many participants—the idea that research has to be based on evidence (either published or self-collected), that it has a purpose (investigating a hypothesis, proving a conjecture, changing a pedagogical approach, broadening understanding), and that it involves reflection and collaboration with colleagues. The interviews demonstrated that research is viewed now by many teachers as a support for changing and improving educational practices, and ultimately benefitting children's learning.

Unintended or negative outcomes were not evident from interviews. As mentioned above, problems were faced due to staff turnover, and in some cases the wide geographical spread of schools meaning that Evidence Champions found it difficult to feel part of a cohesive RLC with little incentive to develop long-term relationships. Outcomes mentioned by schools, however, were about the extent to which schools were developing their evidence-informed practice, and the amount of collaboration with other schools.

Formative findings

The delivery of the intervention itself was generally seen as positive. The majority of suggestions for improvement related to school systems. When asked about improvements, almost all case study and Evidence Champion survey participants replied that the intervention could be improved by schools allocating more time to Evidence Champions to support their work on the project, including reading, discussion, and feedback with colleagues in the school. For example:

> *'Allocating a time each week or fortnight to actively think about what we are doing. It has tended to end up being at the end of a long list of essential "to dos" rather than as a priority'* (Evidence Champion Survey, 2015).

Several participants felt that access to (and the time to read) more research would be helpful, for example through online journals. Some participants also mentioned that they would welcome the opportunity to read more research in-depth, although others felt that summaries would be preferable. A few participants mentioned that it would be good for all schools within an RLC to be focusing on the same project to enable the support to be more tailored, for example:

> *'Linking with other schools would have been more beneficial if a similar project/theme had been undertaken, as it would have been more collaborative rather than separate'* (Evidence Champion survey, 2016).

However, this needs to be balanced with the requirement for participants to 'buy in' to the project: schools and teachers are more likely to commit to a project that fits with their own school agenda, and schools in the same RLC may not all have the same needs. Matching schools by project focus may be difficult to reconcile with the requirement for geographical proximity: several participants mentioned this in the context of building more cohesive networks and facilitating travel to workshops.

Control group activity

One of the two case-study control schools had a strongly research-oriented culture in place. The headteacher in this school promoted engagement with research, reflection on how it could inform practice (research articles were distributed by the headteacher prior to staff meetings for discussion), and supported teachers to use their own classroom data to develop their practice. Two of the senior leadership team were also part of networks that engaged with research to inform and develop practice. Although less structured than an RLC, it seems that this school was working with a similar ethos to that promoted by the intervention. This arose partly from their local network of schools, and partly from the headteacher's belief in the importance of research-informed practice. However, access to a wide range of good-quality research was problematic, and some teachers expressed a lack of confidence in their ability to evaluate published research.

The other case-study control school was less actively engaged with research: they did not have mechanisms for engaging with or sharing published research, and it tended to take a low priority because of other time commitments. Staff felt that research had the potential to inform their practice but relied on senior leaders to tell them how they should implement ideas. This school was only visited once, in the first year of the evaluation, and at this point the headteacher expressed dissatisfaction that the school was in the control group because they had wanted the opportunity to link with other schools.

The two control schools were chosen because of their different levels of engagement with research in the first place. It is interesting to reflect on whether they would have responded differently to the intervention: in the first of the control schools discussed, the teachers were in a position to immediately engage with the intervention, with supporting mechanisms within the school. Whether the second control school would have found the capacity to engage fully with the intervention is questionable—although being in the intervention may have encouraged them to place more of a priority on research.

Conclusion

Key conclusions	
1.	The project found no evidence that Research Learning Communities improves reading outcomes for children at Key Stage 2.
2.	The project did find a positive impact on teachers' disposition towards research. There was, however, some evidence that this impact may have been influenced by other factors such as the level of postgraduate qualifications or seniority of teachers that took part in the intervention.
3.	Exploratory analysis identified some evidence of a small positive relationship between teachers' disposition towards research and pupil outcomes, irrespective of involvement in an RLC.
4.	Evidence Champion roles in each school were intended to be held by the same people throughout the intervention, to support the development of a research-focused culture within each school. Staff turnover was therefore a barrier to implementation.
5.	Some teachers felt that it may take a number of years for participation in an RLC to change teaching practice and improve pupil outcomes. Future research could therefore examine longer term impacts.

Interpretation

The project has demonstrated that it is possible to overcome the barriers to research use cited by numerous researchers (for example, Speight *et al.*, 2016; Nutley *et al.*, 2007; Sharples, 2013; Hemsley-Brown and Sharp, 2003), including teachers' ability to interpret research evidence, through a systematic intervention that seeks to transform evidence in a similar way to that suggested in the pilot study of Nelson *et al.* (2017). However, while the duration of the two-year intervention was suggested by teachers to be appropriate, the duration of this evaluation is problematic in that the processes involved in teacher learning, its impact on teacher practice, and from there the impact on pupil outcomes (as highlighted in the different stages of Guskey's (2000) model), are likely to take place over the longer term.

The intervention demonstrated that it is possible to empower teachers to develop a more confident and reflective approach to using research to inform their practice (as advocated by Sharples, 2013), and to enable evidence-informed practice to emerge in the broadest sense, using existing research to stimulate thinking, and collecting evidence within schools to build on that learning. Although we need to acknowledge that this evidence largely stems from teacher self-reports rather than an independent observation of behaviour change. The analysis of KS2 outcomes demonstrates statistically significant effect sizes of 0.07 (GPS) and 0.09/0.08 (GPS/numeracy) respectively for Measures 1 and 2, for one standard deviation unit of teachers' reported use of research evidence. This indicates a small positive association between teachers' reported use of research evidence, at least for the secondary pupil outcomes examined, irrespective of whether they are in an intervention or control school. The causal nature of this association is, of course, unclear; it may just be that teachers who teach well are also likely to engage with research more, and that there is no direct causal link between the two. Combined, however, with the tentative evidence that the intervention had a positive impact on teachers' reported use of research evidence to inform their practice at the end of the two year RLC period (effect size 0.20–0.21 for Measures 1 and 2), this indicates that in the long term this intervention may have potential to support pupil outcomes of subsequent cohorts of pupils through teacher development. The RLC dosage (how many workshops were attended by Evidence Champions in a school) also approached significance in terms of pupil outcomes for KS2 GPS, which lends further tentative support to this claim. In this case, the effect size was 0.02 for each additional workshop attended.

Limitations

The goal of the intervention was to encourage teachers to develop research-informed practice. Measuring pupil outcomes to assess the impact of the intervention presents some problems. The (simplified) steps of the intervention could be seen as: changing teachers' attitudes towards using research to inform practice; developing teachers' understanding of how to use research to inform practice; and supporting teachers to use research to inform practice. From there, it is expected that a change in teachers' practice will, over time, impact on pupil learning and then on pupil outcomes. To expect this whole process to happen over the course of two years is ambitious and therefore we are not surprised that there were no significant main effects of the intervention on pupil outcomes. Indeed, in this context it is very encouraging that there is even a small effect of teachers' research use on KS2 outcomes.

Further, it is important to consider the substantive focus of research that teachers engage with, and the focus of their development of practice. For teachers to be motivated to engage with research, they need to have some buy-in to the substantive topic, so it is important to allow them some agency in determining their own focus. To make the process of sourcing existing research evidence manageable, the delivery team presented RLCs with a range of substantive topic options, including, but not limited to, those with a literacy or numeracy focus. The eventual foci chosen by RLCs included those around feedback, marking and moderation, growth mindsets, literacy, numeracy, and setting (or some combination of these). However, the nature of pupil outcome measurement means that we had to use pupil outcomes in particular curriculum areas—areas that may not have matched the substantive focus of an RLC. To address this, analysis included a variable of the RLC's focus—which also yielded no significant effects. The RLC focus is, of course, also problematic as a measure: not all schools were focusing specifically on literacy or numeracy, and in addition, some may have been focusing on a more generic topic (for example growth mindsets) but applying this to (for example) teaching practice in numeracy. The pupil outcomes that an individual school is focusing on may differ to the way the project is framed in the RLC as a whole—and these outcomes may not directly relate to reading, numeracy, grammar, punctuation, and spelling. In addition, some schools changed their substantive focus from one year to the next (as was evident in case study schools and RLC observations).

RLCs aim to support teachers to develop and reflect critically on their own practice through engagement with evidence. These skills are developed through teachers learning to read and understand existing research evidence, and using that learning to evaluate needs in their own school, develop strategies to meet those needs, and evaluate the implementation of those strategies—in short, develop evidence-informed action research cycles. The approach is not just about teachers taking interventions that have been found to be effective in other contexts and applying them in their own school; it is about developing a more critical perspective on practice. In an RLC, teachers focus on research around issues that they believe need addressing in their school, and through that engagement with evidence, develop their own ideas for how to develop their practice. The developers selected evidence that they deemed to be of high quality on each topic, and summarized it in such a way that it was accessible for teachers. This was then used as a basis for discussion within the workshops, to support the development of teachers' critical engagement with research.

The extent of missing data in the analyses involving teacher outcomes should also be considered a limitation. While the balance of characteristics of treatment and control schools was not substantially affected, this resulted in a reduction of sample size and subsequently in power for Part 2 analysis linking pupil outcomes to teacher outcomes, and the analysis of teacher survey outcomes. Nonetheless, the scope of the trial and the diversity within the sample in terms of characteristics suggests that the findings will be relevant to a wide range of schools.

Future research and publications

Future research is needed to explore the relationship between teacher background characteristics and their response to the intervention. In addition, it is important to explore the different possibilities afforded by the role of Evidence Champions in terms of developing a whole-school research culture, and how

this can work in different types of school with different existing orientations to research. The case studies highlighted that the role of Evidence Champion worked in different ways for different staff members, and for different schools, but did not allow for a systematic exploration of this. Also among the factors that were seen as relevant to the success of the project by interviewees, the most important was that schools already had a 'research-friendly' culture in the schools, so further research on this aspect would be helpful. Most crucially, however, more research is needed to understand the longer-term impact of engagement with research and a developing whole-school research culture on teachers' practice and the outcomes of subsequent cohorts of pupils taught by participating teachers.

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Appendix A: EEF cost rating

Cost ratings are based on the approximate cost per pupil per year of implementing the intervention over three years. More information about the EEF's approach to cost evaluation can be found here. Cost ratings are awarded as follows:

Cost rating	Description
£ £ £ £ £	*Very low:* less than £80 per pupil per year.
£ £ £ £ £	*Low:* up to about £200 per pupil per year.
£ £ £ £ £	*Moderate:* up to about £700 per pupil per year.
£ £ £ £ £	*High:* up to £1,200 per pupil per year.
£ £ £ £ £	*Very high:* over £1,200 per pupil per year.

Appendix B: Security classification of trial findings

Rating	Criteria for rating			Initial score		Adjust		Final score
	Design	**Power**	**Attrition[5]**					
5	Well conducted experimental design with appropriate analysis	MDES < 0.2	0-10%	**5**		Adjustment for Balance **[0]**		5
4	Fair and clear quasi-experimental design for comparison (e.g. RDD) with appropriate analysis, or experimental design with minor concerns about validity	MDES < 0.3	11-20%					
3	Well-matched comparison (using propensity score matching, or similar) or experimental design with moderate concerns about validity	MDES < 0.4	21-30%					
2	Weakly matched comparison or experimental design with major flaws	MDES < 0.5	31-40%			Adjustment for threats to internal validity **[0]**		
1	Comparison group with poor or no matching (E.g. volunteer versus others)	MDES < 0.6	41-50%					
0	No comparator	MDES > 0.6	over 50%					

- **Initial padlock score:** lowest of the three ratings for design, power and attrition = 5 padlocks
- **Reason for adjustment for balance** (if made): N/A
- **Reason for adjustment for threats to validity** (if made): N/A
- **Final padlock score:** initial score adjusted for balance and internal validity = 5 padlocks

The design is a randomised controlled trial. MDES is 0.18 at randomisation, pupil level attrition is approx. 9%. The data is balanced on pre-test pupil attainment and there are no substantial threats to validity.

[5] Attrition should be measured at the pupil level (even for clustered trials) and from the point of randomisation to the point of analysis.

Appendix C: MoU

Agreement to participate in the Research Learning Communities project and evaluation

Please sign both copies, retaining one and returning the second copy to Dr Chris Brown. You can do this either by post (please send the signed copy to: London Centre for Leadership in Learning, Institute of Education, 20 Bedford Way, London WC1H 0AL) or by email (chris.brown@ioe.ac.uk).

School Name: _____

Aims of the Evaluation

The aim of this project is to evaluate the impact of Research Learning Communities - an approach designed to improve schools' awareness and use of research. The evaluation will look at both changes in teaching practice and Key Stage 2 outcomes. The results of the project will contribute to our understanding of what works in improving teaching and learning and will be widely disseminated to schools in England. Ultimately we hope that the evaluation will equip school staff with the skills needed to be able to use research to enhance their practice and so improve learning outcomes for all pupils.

The Project

Starting in September 2014, the London Centre for Leadership in Learning (LCLL) at the IOE will be collaborating with some 100+ primary/junior schools in a two year project to explore ways of using evidence to support improvement at Key Stage 2. As part of the project, we will:

- Identify and recruit 2-3 'evidence champions' from each school, at least one of whom will be the head teacher or another senior leader.
- Work with the evidence champions in Research Learning Communities (RLCs). Each RLC will bring together evidence champions from around five schools. Evidence champions will attend eight Research Learning Community workshops between September 2014 and July 2016 (i.e. four workshops each school year). Workshops will be designed to help evidence champions examine research and evidence relating to an agreed area of focus, and to develop, apply and evaluate school key stage-wide improvement strategies based on this evidence.
- Ensure between workshops that evidence champions are provided with intersessional tasks to guide their evidence sharing activity and to help them effectively implement their improvement strategies. Extensive support will also be provided to help schools with these tasks.
- Build capacity to ensure the sustainability of the approach, meaning that schools can continue to run RLCs and use evidence effectively, after the project ends.

Structure of the Evaluation

The evaluation is being conducted by the University of Bristol. Schools who agree to take part are randomly allocated to either the intervention group or a wait-list control group. This allocation will happen in September 2014. Random allocation is essential to the evaluation as it is the best way of outlining what effect Research Learning Communities have on children's attainment. It is important that schools understand and consent to this process.

Following the allocation of schools into intervention or control:

- The schools in the intervention group will receive support from LCLL, through RLCs in the 2014/205, and 2015/2016 academic years.
- The schools in the control group will receive free access to RLCs from the 2016/17 academic year. In addition, they will receive a financial incentive of £1,000 at the end of the 2015/16 academic year, for their full participation in the evaluation.

Pupil attainment at KS2 literacy and numeracy in 2015/16 will be used for the evaluation. The attainment of all pupils in this cohort in all the schools in the evaluation will be used. In addition, 85% of all teachers (including all KS2 teachers) of all RLC and control schools in the evaluation will complete three surveys about their awareness, understanding and use of research. These surveys will be collected in July 2014, June 2015, and June 2016. Interviews will be conducted with school staff at two time points across the project in eight schools (six RLC schools and two control schools).

Use of Data

Pupils' KS2 scores and any other pupil data will be treated with the strictest confidence. Pupils' KS2 scores and other data will accessed through the National Pupil Database by the University of Bristol. This will be shared with the London Centre for Leadership and Learning, and with EEF. No individual school or pupil will be identified in any report arising from the research.

Responsibilities

In running this project, the role of the London Centre for Leadership in Learning will be to:

1. Identify the key area of focus for each RLC each year and identify research and evidence relating to this focus.
2. Deliver eight workshops for each Research Learning Community over the course of the project (September 2014 – July 2016: i.e. four workshops each year) and within these work with RLCs to examine relevant research and evidence and to help RLCs develop, apply and evaluate school or key stage-wide improvement strategies based on the evidence.
3. Develop intersessional activity that helps evidence champions share evidence within their schools and to apply and evaluate school or key stage-wide improvement strategies
4. Provide on-going support to the evidence champions to help with intersessional activity
5. Be the first point of contact for any questions about the evaluation

The University of Bristol will:

i. Conduct the random allocation.
ii. Collect and analyse all the evaluation data from the project
iii. Disseminate research findings

The role of participating schools will be to:

1. Identify a member of the leadership team to take overall responsibility for the success of the initiative in school and to ensure the completion of all required reporting.
2. Consent to random allocation and commit to the outcome (whether RLC or control).
3. RLC schools will commit to providing 2-3 'evidence champions' and ensuring these are released to the project. At least one evidence champion will be the headteacher or another senior leader and one an identified opinion leader (see below): i.e. a teacher who is frequently turned to for advice and support with regards to teaching and learning. The evidence champions will need to be attend all four workshops each year and will also need to be released to and supported in developing their agreed improvement project and in engaging intersessional activity.
4. RLC schools will ensure all their teachers complete evaluation surveys in June 2014, June 2015 and June 2016. RLC schools will also need to ensure their teachers complete a 'Social Network Analysis' survey in September 2014 to enable the research team to ascertain key opinion leaders within schools.
5. RLC schools will take it in turns to host RLC workshop sessions.
6. Control schools will ensure their teachers complete evaluation surveys in June 2014, June 2015 and June 2016.
7. RLC and control schools will provide a 2015/16 class list of Year 6 pupils using UPNs and linked to the teacher.
8. Headteachers from both RLC and control schools need to indicate their preferred areas of improvement in relation to improving KS2 outcomes so that LCLL can ensure each RLC has a common focus area.

9. Headteachers should inform Dr Chris Brown if they are involved in any other EEF funded projects.

Please note that schools will need to provide the following data / information in order to be considered for the project:

- This agreement signed by the school Head and Chair of Governors
- The evaluation survey issued in June 2014 to be completed by 85% of teachers (including all KS2 teachers) see point 4, above.
- A 2014/15 class list of Year 5 pupils using UPNs and linked to the teacher.

We commit to the evaluation of Research Learning Communities as detailed above

Head teacher [NAME]:

Headteacher email:

Chair of Governors [NAMES]:

Date:

Appendix D: Letters of consent

D.1 Teacher information letter prior to survey

Research Learning Communities Project Evaluation

Dear Teacher

You may be aware that your school is participating in the Research Learning Communities project, run by the Institute of Education (IOE). Researchers from the Graduate School of Education at the University of Bristol will be conducting an evaluation of Research Learning Communities. As a teacher at a school participating in the Research Learning Communities project, we would like to invite you to participate in the evaluation.

Aims of the Evaluation

The aim is to evaluate the impact of Research Learning Communities - an approach designed to improve schools' awareness and use of research. The evaluation will look at both changes in reported teaching practice and at Key Stage 2 outcomes. The results of the project will contribute to our understanding of what works in improving teaching and learning and will be widely disseminated to schools in England. Ultimately we hope that the evaluation will equip school staff with the skills needed to be able to use research to enhance their practice and so improve learning outcomes for all pupils.

The Project

Starting in September 2014, the London Centre for Leadership in Learning (LCLL) at the IOE will be collaborating with some 100+ primary/junior schools in a two year project to explore ways of using evidence to support improvement at Key Stage 2. As part of the project, LCLL will:

- Identify and recruit 2-3 'evidence champions' from each school, at least one of whom will be the head teacher or another senior leader.

- Work with the evidence champions in Research Learning Communities (RLCs). Each RLC will bring together evidence champions from around five schools. Evidence champions will attend eight Research Learning Community workshops between September 2014 and July 2016 (i.e. four workshops each school year). Workshops will be designed to help evidence champions examine research and evidence relating to an agreed area of focus, and to develop, apply and evaluate school key stage-wide improvement strategies based on this evidence.

- Ensure between workshops that evidence champions are provided with intersessional tasks to guide their evidence sharing activity and to help them effectively implement their improvement strategies. Extensive support will also be provided to help schools with these tasks.

- Build capacity to ensure the sustainability of the approach, meaning that schools can continue to run RLCs and use evidence effectively, after the project ends.

Structure of the Evaluation

The evaluation is being conducted by the University of Bristol. Schools who agree to take part in the project will be randomly allocated to either the intervention group or a wait-list control group. This allocation will happen in September 2014.

The schools in the intervention group will receive support from LCLL, through RLCs in the 2014/2015, and 2015/2016 academic years. The schools in the control group will receive free access to RLCs from the 2016/17 academic year. In addition, those schools in the control group who participate fully in the evaluation will receive a financial incentive of £1000 at the end of the 2015/16 academic year.

The evaluation data collection will comprise three main strands:

- Pupil attainment at KS2 literacy and numeracy in 2015/16. These will be accessed using Unique Pupil Numbers provided by schools. The attainment of all pupils in this cohort in all the schools in the evaluation will be used.

- All teachers in all RLC and control schools in the evaluation will be asked to complete three short surveys about their awareness, understanding and use of research. These surveys will be collected in July 2014, June 2015, and June 2016. The survey to be collected in July 2014 will take around 5 minutes to complete; the following surveys will take around 15-20 minutes to complete.

- To understand how schools engage with RLCs, interviews will be conducted with selected school staff at two time points across the project in eight schools (six RLC schools and two control schools). Interviews will take between 30 and 60 minutes each.

Use of Data

Pupils' KS2 scores and any other pupil data will be treated with the strictest confidence. Pupils' KS2 scores and other data will accessed through the National Pupil Database by the University of Bristol. This will be shared with LCLL, and with EEF. No individual school or pupil will be identified in any report arising from the research. Fully anonymised data from the teacher surveys will be shared with the National Foundation for Educational Research, who have developed the survey instruments.

Right to withdraw

Although it is important for the evaluation to work with as full a dataset as possible, participation in the evaluation data collection is voluntary for teachers. You have the option not to take part in the study, and we will not share the names of those who decline to take part with their schools. You can choose

to withdraw at any point in the study, for example when asked to take part in a later survey, or if asked to take part in an interview. If you complete a survey and then change your mind about participation, you do not have to submit your responses. If you complete an interview and then change your mind about participation, please let us know by July 2016 (when we will be completing the data collection).

If you decide not take part in the evaluation, or any part thereof, please contact Jo Rose at the University of Bristol, with your name, class name/number, and school, using the contact details below. Any teachers that choose not to take part will not be identified to their schools. In the meantime, if you have any questions or queries please contact the evaluation team at the University of Bristol using the contact details below.

We look forward to working with you over the coming two years.

Best wishes

Dr Jo Rose	jo.rose@bristol.ac.uk
Professor Sally Thomas	s.thomas@bristol.ac.uk
Dr Tim Jay	tim.jay@bristol.ac.uk

D.2 Teacher baseline survey consent

EEF RLC Evaluation Teacher Baseline Survey: Text to be used as intro/consent

Welcome

Thank you very much for agreeing to take part in this survey. This survey is part of a project commissioned by the Education Endowment Foundation which is exploring how schools improve their teaching and learning. The survey was developed by the National Foundation for Educational Research, and responses are being collected by a team from the Graduate School of Education, at the University of Bristol. We'd like to start by asking a few general questions on the types of information you use to inform decisions around teaching and learning in your school. There are no right and wrong answers - we are interested in hearing about your views and experiences in this area.

The survey is short, comprising three main questions and some background information, and should take no more than ten minutes to complete. Your answers will be treated confidentially so you and your school will not be identified in any reports produced from this research.

We will ask you to provide your name and class taught as part of this survey. This is so that we can link your responses to pupil data which is also being collected as part of the project. However, once you have submitted your responses you will then be assigned a code which will be used instead of your name: There will be a separate file linking your name to the code. This is to help ensure that all responses remain anonymous.

Participation in this survey is voluntary. By completing and submitting this survey you are implying that you have given consent for your data to be used anonymously as part of the project. There will be a button to click at the end of the survey, when you can choose to submit your data. **Please submit your responses by the end of July 2014**.

D.3 Teacher survey consent

EEF RLC Teacher Main Survey Consent: Text used as front page of online survey

Welcome

Thank you very much for agreeing to take part in this survey.

In this survey we are going to ask you some questions about **research** in general, your participation in the Research Learning Community (RLC) **workshops** (if to a treatment school) and the **RLC project** in general. There are no right or wrong answers - we are interested in hearing about your views and experiences in these areas.

Your answers will be treated confidentially so you and your school will not be identified in any reports produced from this research.

We will ask you to provide your name as part of this survey. This is so that we can link your responses to pupil data which is also being collected as part of the project. However, once you have submitted your responses you will then be assigned a code which will be used instead of your name. There will be a separate file linking your name to the code. This is to help ensure that all responses remain anonymous.

Participation in this survey is voluntary. By completing and submitting this survey you are implying that you have given consent for your data to be used anonymously as part of the project. There will be a button to click at the end of the survey, when you can choose to submit your data.

The survey is likely to take around 30 minutes to complete.

Please submit your responses by (DATE).

D.4 Evidence Champion survey consent

Evidence Champion Survey Consent: Text used as front page of online survey

Welcome

Thank you very much for agreeing to take part in this survey.

In this survey we are going to ask you some questions about **research** in general, your participation in the Research Learning Community (RLC) **workshops**, your role as **Evidence Champions** and the **RLC project** in general. There are no right or wrong answers - we are interested in hearing about your views and experiences in these areas. Your answers will be treated confidentially so you and your school will not be identified in any reports produced from this research.

We will ask you to provide your name as part of this survey. This is so that we can link your responses to pupil data which is also being collected as part of the project. However, once you have submitted your responses you will then be assigned a code which will be used instead of your name. There will be a separate file linking your name to the code. This is to help ensure that all responses remain anonymous.

Participation in this survey is voluntary. By completing and submitting this survey you are implying that you have given consent for your data to be used anonymously as part of the project. There will be a button to click at the end of the survey, when you can choose to submit your data.

The survey is likely to take around 30 minutes to complete. **Please submit your responses by (DATE).**

Appendix E: Teacher information and consent for interviews

Research Learning Communities Project Evaluation

Information sheet for staff from schools or colleges participating in the Research Learning Communities Project Evaluation Interviews

Dear Teacher

You may be aware that your school is participating in the Research Learning Communities project, run by the Institute of Education (IOE). Researchers from the Graduate School of Education at the University of Bristol are conducting an evaluation of Research Learning Communities. As a teacher at a school participating in the Research Learning Communities project, we would like to invite you to participate in an interview as part of the evaluation. During the interview, we would like to discuss ways in which you engage with research as part of your role in school, and your thoughts on the Research Learning Communities project (NB This last part only if interviewing staff in RLC school).

Aims of the Evaluation

The aim is to evaluate the impact of Research Learning Communities - an approach designed to improve schools' awareness and use of research. The evaluation will look at both changes in reported teaching practice and at Key Stage 2 outcomes. The results of the project will contribute to our understanding of what works in improving teaching and learning and will be widely disseminated to schools in England. Ultimately we hope that the evaluation will equip school staff with the skills needed to be able to use research to enhance their practice and so improve learning outcomes for all pupils.

The Project

The London Centre for Leadership in Learning (LCLL) at the IOE are collaborating with some 100+ primary/junior schools in a two-year project to explore ways of using evidence to support improvement at Key Stage 2. As part of the project, LCLL will:

Identify and recruit 2-3 'evidence champions' from each school, at least one of whom will be the head teacher or another senior leader.

Work with the evidence champions in Research Learning Communities (RLCs). Each RLC will bring together evidence champions from around five schools. Evidence champions will attend eight Research

Learning Community workshops between September 2014 and July 2016 (i.e. four workshops each school year). Workshops will be designed to help evidence champions examine research and evidence relating to an agreed area of focus, and to develop, apply and evaluate school key stage-wide improvement strategies based on this evidence.

Ensure between workshops that evidence champions are provided with intersessional tasks to guide their evidence sharing activity and to help them effectively implement their improvement strategies. Extensive support will also be provided to help schools with these tasks.

Build capacity to ensure the sustainability of the approach, meaning that schools can continue to run RLCs and use evidence effectively, after the project ends.

Structure of the Evaluation

The evaluation is being conducted by the University of Bristol. Schools who agree to take part in the project have been randomly allocated to either the intervention group or a wait-list control group. This allocation happened in September 2014.

The schools in the intervention group will receive support from LCLL, through RLCs in the 2014/2015, and 2015/2016 academic years. The schools in the control group will receive free access to RLCs from the 2016/17 academic year. In addition, those schools in the control group who participate fully in the evaluation will receive a financial incentive of £1000 at the end of the 2015/16 academic year.

The evaluation data collection comprises three main strands:

Pupil attainment at KS2 literacy and numeracy in 2015/16. These will be accessed using Unique Pupil Numbers provided by schools. The attainment of all pupils in this cohort in all the schools in the evaluation will be used.

All teachers in all RLC and control schools in the evaluation will be asked to complete three short surveys about their awareness, understanding and use of research. These surveys will be collected in July 2014, June 2015, and June 2016.

To understand how schools engage with RLCs, interviews will be conducted with selected school staff at two time points across the project in eight schools (six RLC schools and two control schools). Interviews will take between 30 and 60 minutes each.

Use of Data

Pupils' KS2 scores and any other pupil data will be treated with the strictest confidence. Pupils' KS2 scores and other data will accessed through the National Pupil Database by the University of Bristol. This will be shared with LCLL, and with EEF. No individual school or pupil will be identified in any report

arising from the research. Fully anonymised data from the teacher surveys will be shared with the National Foundation for Educational Research, who have developed the survey instruments.

Right to withdraw

Although it is important for the evaluation to work with as full a dataset as possible, participation in the evaluation data collection is voluntary for teachers. You have the option not to take part in the study, and we will not share the names of those who decline to take part with their schools. You can choose to withdraw at any point in the study, for example when asked to take part survey, or if asked to take part in an interview. If you complete a survey and then change your mind about participation, you do not have to submit your responses. If you complete an interview and then change your mind about participation, please let us know by the end of July 2016.

If you decide not take part in the evaluation, or any part thereof, please contact Jo Rose at the University of Bristol, with your name, class name/number, and school, using the contact details below. Any teachers that choose not to take part will not be identified to their schools. In the meantime, if you have any questions or queries please contact the evaluation team at the University of Bristol using the contact details below.

We look forward to working with you over the coming two years.

Dr Jo Rose jo.rose@bristol.ac.uk

Professor Sally Thomas s.thomas@bristol.ac.uk

Dr Tim Jay tim.jay@bristol.ac.uk

CONSENT FORM FOR SCHOOL STAFF TAKING PART

IN THE RESEARCH LEARNING COMMUNITIES PROJECT EVALUATION INTERVIEWS

Conducted by researchers from University of Bristol

I confirm that I have read and understood the information sheet relating to the Research Learning Communities project evaluation

I _____ volunteer to participate in an interview for the above named project.

I have:	**Yes**	**No**
Been given information explaining about the project	❑	❑
Had an opportunity to ask questions and discuss the project	❑	❑

Received satisfactory answers to any questions I have asked	❑	❑
Received enough information to make a decision about participating	❑	❑

I consent to my data being collected, stored anonymously, and used by the researcher for the purpose of the project (TICK as appropriate)

❑

I agree to the interview being audio recorded, and the recording being used as an aid to data collection (TICK as appropriate):

❑

I understand that I am free to withdraw my consent from participating in this project at any time until July 2016, without giving a reason (TICK as appropriate):

❑

Signed: _____ Print name: _____Date:_____

Having participated in the project evaluation: I give permission for the University of Bristol to keep and use the data I have provided during the course of the evaluation, for the purposes outlined in the information sheet.

Signed: _____ Print name: _____Date:_____

Appendix F: Parent opt-out consent

Dear Parent

Teachers at (name of the school) are currently working with the Institute of Education at the University of London on a project called Research Learning Communities. Teachers from schools in the project are/will be working together to understand how they can develop and improve their teaching. The project is funded by the Education Endowment Foundation (EEF).

The University of Bristol is evaluating the project. As part of the evaluation, we would like to use Key Stage Two SATs scores from children in Year 6 at your child's school. This will help us understand whether the Research Learning Communities project has led to any change in pupil attainment. The SATs scores will be accessed from the National Pupil Database, using Unique Pupil Numbers from the school. The SATs scores will be anonymous, and the evaluation team from the University of Bristol will not be able to link your child's scores to their name.

These anonymous SATs scores will be linked with other data from the National Pupil Database (held by the Department for Education), and other official records, and shared for research purposes with the project team at the Institute of Education, the evaluation team at the University of Bristol, the EEF's data archive, EEF's data contractor FFT Education, and the UK Data Archive. The UK Data Archive can be accessed by other researchers for research purposes. Your child's name or the name of any school will not be shared with the UK Data Archive. We will not use your child's name or the name of the school in any report arising from the research.

As your child will be doing Key Stage 2 SATs anyway, there should be no extra burden on your child's time. However, if you prefer for your child's SATs scores NOT to be used, please inform their teacher using the attached form, by 23 March 2016. There will be no consequences for your child if you choose to withdraw their data from this study. If you would like more information, please contact:

Dr Sara Speybroeck, Research Associate, Graduate School of Education, University of Bristol.

Email sara.speybroeck@bristol.ac.uk Telephone 0117 331 4159.

Best wishes

Dr Jo Rose, Lecturer in Education (Evaluation lead)

Dr Sara Speybroeck, Research Associate

Professor Sally Thomas, Professor of Education

Graduate School of Education, University of Bristol

Research Learning Communities Project Evaluation

If you would NOT like your child's SATs scores to be used as part of the Research Learning Communities project evaluation, please complete the form below and return it to your child's teacher.

Name of Parent/Carer…….

Name of Child ……

I would NOT like my child's SATs scores to be used as part of the Research Learning Communities project evaluation.

Signed…….. Date……

Appendix G: Summary tables of sample sizes/missing data

Table G.1: Analysis Samples

	Intervention group		Control group	
	School n/N (missing)	**Pupil n/N (missing)**	**School n/N (missing)**	**Pupil n/N (missing)**
Baseline	60/60 (0)	2619/2619(0)	59/59 (0)	2933/2933(0)
KS2 outcome analysis Reading (Part 1)	59/60 (1)	2402/2619(217)	57/59 (2)	2564/2933(369)
KS2 outcome analysis Numeracy (Part 1)	59/60 (1)	2412/2619(207)	57/59 (2)	2588/2933(345)
KS2 outcome analysis GPS (Part 1)	59/60 (1)	2412/2619(207)	57/59 (2)	2585/2933(348)
KS2 outcome analysis Reading (Part 2: teacher survey)	47/60(13)	1432/2619(1187)	35/59(24)	1439/2933(1494)
KS2 outcome analysis Numeracy (Part 2: teacher survey)	47/60(13)	1440/2619(1179)	35/59(24)	1446/2933(1487)
KS2 outcome analysis GPS (Part 2: teacher survey)	47/60(13)	1440/2619(1179)	35/59(24)	1446/2933(1487)
KS2 outcome analysis Reading (Part 2: intervention dosage)	55/60(5)	2025/2619(594)	49/59(10)	2106/2933(827)
KS2 outcome analysis Numeracy (Part 2: intervention dosage)	55/60(5)	2033/2619(586)	49/59(10)	2119/2933(814)
KS2 outcome analysis GPS (Part 2: intervention dosage)	55/60(5)	2033/2619(586)	49/59(10)	2120/2933(813)

Table G.2 Analysis Samples of Teacher Survey Outcomes

	Intervention group		Control group	
	School n/N (missing)	**Teacher n/N (missing)**	**School n/N (missing)**	**Teacher n/N (missing)**

Baseline	59/60 (0)	834/1037(0)	59/59 (0)	875/1102(0)
Teacher Survey round 2	56/60(4)	441/1037(596)	52/59(7)	525/1102(577)
Teacher Survey round 3	39/60(21)	235/1037(802)	40/59(19)	464/1102(638)
	Mean percentage of teacher non responses across responded schools	**Range in percentage of teacher non responses across responded schools**	**Mean percentage of teacher non responses across responded schools**	**Range in percentage of teacher non responses across responded schools**
Teacher Survey round 2	50.0%	[0.1%, 92.3%]	47.8%	[0.0%,95.2%]
Teacher Survey round 3	61.2%	[0.0%,93.8%]	42.9%	[0.0%, 95.5%]

Table G.3 Analysis Samples Pupil KS2 Outcomes Part 1: number of missing values for each variable in the sample (N=5552 from 119 schools)

Variable	Number of missing values	Percentage of missing values
KS2 Reading	176	3.2%
KS2 Maths	131	2.4%
KS2 Grammar, Punctuation and Spelling	137	2.5%
Standardised KS1 Reading	358	6.4%
Standardised KS1 Writing	357	6.4%
Standardised KS1 math	357	6.4%
Standardised KS1 science	359	6.5%
everFSM	2	0.0%

Notes: There were three schools missing in Part 1 analysis: School (3723003) in control group due to all 19 students missing KS2 reading score; School (8787044) in treatment group due to all 7 students missing KS2 reading score; School (3112042) in control group was dropped out due to no pupils in Year 5 and/or Year 6;

Table G.4 Analysis Samples Pupil KS2 Outcomes Part 2: number of missing values for each variable in the sample (n=4418 from 106 schools)

Original sample (Pupils with only Year5 UPNs or both Year5 & Year6 UPNS)	4871 in 106 schools
With Unique ID provided for NPD dataset	4858
Having the KS2 results recorded in the same school as they were in Year 5	4418

Variables	Number of missing values	Percentage of missing values	Number of observations
KS2 Reading Score	118	2.7%	4,300
KS2 Math Score	90	2.0%	4,328
KS2 GPS Score	91	2.1%	4,327
Year5 and Year 6 teachers	1,310	29.7%	3,108
KS1reading score	177	4.0%	4,241
KS1writing score	176	4.0%	4,242
KS1maths score	176	4.0%	4,242
KS1science score	177	4.0%	4,241
everFSM	2	0.1%	4,416

Table G.5: Comparison of school data for schools in Part 1 analysis (pupil outcomes)

Variable	Intervention group		Control group	
School-level (continuous)	n/N (missing)	Mean	n/N (missing)	Mean
Size of School	59/59 (0)	329.2	57/57 (0)	345.7

% FSM Eligibility	59/59 (0)	20.9%	57/57 (0)	22.4%
Attainment at KS2 (% achieving level 4 in reading, writing and maths)	59/59 (0)	80.4%	57/57 (0)	74.6%
% Pupils with English as an Additional Language (EAL)	59/59 (0)	26.3%	57/57 (0)	24.9%
% Pupils with SEN	59/59 (0)	1.5%	57/57 (0)	3.2%
% Boys	59/59 (0)	50.7%	57/57 (0)	51.7%
School-level (categorical)	**n/N (missing)**	**Percentage**	**n/N (missing)**	**Percentage**
Ofsted Rating	45/59 (14)		44/57 (13)	
Outstanding	9/59 (0)	15%	11/57 (0)	19%
Good	35/59 (0)	59%	31/57 (0)	54%
Requires Improvement	1/59 (0)	2%	2/57 (0)	4%
Inadequate	0/59 (0)	0%	0/57 (0)	0%
None	14/59 (0)	24%	13/57 (0)	23%
School Location				
Urban	49/59 (0)	83%	50/57 (0)	88%
Rural	10/59 (0)	17%	7/57 (0)	12%
FSM eligibility				
High (>35%)	13/59 (0)	22%	11/57 (0)	19%
Medium (20.1% - 35%)	7/59 (0)	12%	14/57 (0)	25%
Low (< 20.1%)	39/59 (0)	66%	32/57 (0)	56%
School Type				
Academy – Converter Mainstream	9/59 (0)	15%	5/57 (0)	9%
Academy Sponsor Led Mainstream	5/59 (0)	8%	9/57 (0)	16%

Community	33/59 (0)	56%	29/57 (0)	51%
Community Special	0/59 (0)	0%	1/57 (0)	2%
Foundation	1/59 (0)	2%	1/57 (0)	2%
Foundation Special	0/59 (0)	0%	0/57 (0)	0%
Voluntary Aided	10/59 (0)	17%	8/57 (0)	14%
Voluntary Controlled	1/59 (0)	2%	4/57 (0)	7%

Table G.6: Comparison of school data for schools in Part 2 analysis (pupil outcomes linked to teacher data)

Variable	Intervention group		Control group	
School-level (continuous)	**n/N (missing)**	**Mean**	**n/N (missing)**	**Mean**
Size of School	47/47 (0)	329.8	36/36 (0)	369.9
% FSM Eligibility	47/47 (0)	20.7%	36/36 (0)	21.4%
Attainment at KS2 (% achieving level 4 in reading, writing and maths)	47/47 (0)	80.9%	36/36 (0)	75.8%
% Pupils with English as an Additional Language (EAL)	47/47 (0)	26.5%	36/36 (0)	27.9%
% Pupils with SEN	47/47 (0)	1.6%	36/36 (0)	1.5%
% Boys	47/47 (0)	50.4%	36/36 (0)	50.9%
School-level (categorical)	**n/N (missing)**	**Percentage**	**n/N (missing)**	**Percentage**
Ofsted Rating	36/47 (11)		28/36 (8)	
Outstanding	7/47 (0)	15%	7/36 (0)	19%
Good	29/47 (0)	62%	19/36 (0)	53%
Requires Improvement	0/47 (0)	0%	2/36 (0)	6%
Inadequate	0/47 (0)	0%	0/36 (0)	0%

None	11/47 (0)	23%	8/36 (0)	22%
School Location				
Urban	38/47 (0)	81%	33/36 (0)	92%
Rural	9/47 (0)	19%	3/36 (0)	8%
FSM eligibility				
High (>35%)	10/47 (0)	21%	7/36 (0)	19%
Medium (20.1% - 35%)	5/47 (0)	11%	7/36 (0)	19%
Low (< 20.1%)	32/47 (0)	68%	22/36 (0)	62%
School Type				
Academy – Converter Mainstream	8/47 (0)	17%	4/36 (0)	11%
Academy Sponsor Led Mainstream	3/47 (0)	6%	6/36 (0)	17%
Community	27/47 (0)	57%	19/36 (0)	53%
Community Special	0/47 (0)	0%	0/36 (0)	0%
Foundation	0/47 (0)	0%	1/36 (0)	3%
Foundation Special	0/47 (0)	0%	0/36 (0)	0%
Voluntary Aided	8/47 (0)	17%	3/36 (0)	8%
Voluntary Controlled	1/47 (0)	2%	3/36 (0)	8%

Note: The reduced sample (more conservative) reported here was used in models of KS2 outcome (KS2 Reading/ KS2 Numeracy/ KS2 GPS) with dosage, randomisation control variables, prior attainment and FSM and teacher background variables.

Table G.7: Comparison of school data for schools in Teacher Survey (round 3) Outcomes Analysis

Variable	Intervention group		Control group	
School-level (continuous)	n/N (missing)	Mean	n/N (missing)	Mean
Size of School	39/39 (0)	287.3	40/40 (0)	362.8
% FSM Eligibility	39/39 (0)	18.4%	40/40 (0)	19.0%

Attainment at KS2 (% achieving level 4 in reading, writing and maths)	39/39 (0)	80.1%	40/40 (0)	73.5%
% Pupils with English as an Additional Language (EAL)	39/39 (0)	20.7%	40/40 (0)	25.0%
% Pupils with SEN	39/39 (0)	4.1%	40/40 (0)	1.4%
% Boys	39/39 (0)	51.0%	40/40 (0)	51.1%
School-level (categorical)	**n/N (missing)**	**Percentage**	**n/N (missing)**	**Percentage**
Ofsted Rating	32/39 (7)		31/40 (9)	
Outstanding	8/39 (0)	21%	7/40 (0)	18%
Good	23/39 (0)	59%	22/40 (0)	55%
Requires Improvement	1/39 (0)	3%	2/40 (0)	5%
Inadequate	0/39 (0)	0%	0/40 (0)	0%
None	7/39 (0)	18%	9/40 (0)	23%
School Location				
Urban	30/39 (0)	77%	35/40 (0)	88%
Rural	9/39 (0)	23%	5/40 (0)	13%
FSM eligibility				
High (>35%)	5/39 (0)	13%	5/40 (0)	13%
Medium (20.1% - 35%)	6/39 (0)	16%	9/40 (0)	23%
Low (< 20.1%)	28/39 (0)	72%	26/40 (0)	65%
School Type				
Academy – Converter Mainstream	5/39 (0)	13%	5/40 (0)	13%
Academy Sponsor Led Mainstream	2/39 (0)	5%	6/40 (0)	15%
Community	23/39 (0)	59%	19/40 (0)	48%
Community Special	0/39 (0)	0%	0/40 (0)	0%
Foundation	0/39 (0)	0%	1/40 (0)	3%
Foundation Special	1/39 (0)	3%	0/40 (0)	0%

Voluntary Aided	7/39 (0)	18%	5/40 (0)	13%
Voluntary Controlled	1/39 (0)	3%	4/40 (0)	10%

Table G7.8:Table of Cross-tabulation (Status by Intervention/Control)

Status	Control group	Intervention group	Total
Classroom teacher	252	114	366
Middle leader (e.g. head of department, subject or curriculum area leader, key s	131	74	205
Senior leader (e.g. deputy or assistant headteacher)	50	24	74
Headteacher, principal or director	11	15	26
SEN teacher	3	2	5
Supply/PPA cover teacher	10	5	15
High Level Teaching Assistant	3	1	4
Specialist teacher (e.g. PE/Music teacher)	4	0	4
Total	464	235	699

Table G7.9:Table of Cross-tabulation (Holds postgraduate qualifications by Intervention/Control)

Holds postgraduate qualifications	Control group	Intervention group	Total
Without Postgraduate qualification	430	205	635
With Postgraduate qualification	34	30	64
Total	464	235	699

Table G7.10:Table of Cross-tabulation (Year of teaching by Intervention/Control)

Years of teaching	Control group	Intervention group	Total
30 years or more	10	7	17
20-29 years	54	32	86
10-19 years	131	55	186
5-9 years	113	56	169
1-4 years	107	70	177
First year of teaching (NQT)	49	15	64
Total	464	235	699

Table G7.11:Table of Cross-tabulation (Year of teaching in current school by Intervention/Control)

Years of teaching in current school	Control group	Intervention group	Total
30 years or more	2	1	3
20-29 years	11	10	21
10-19 years	70	43	113
5-9 years	108	45	153
1-4 years	199	115	314
Less than 1 year	74	21	95
Total	464	235	699

Appendix H: Multilevel Modelling Results

Table H.1 Multilevel model results for part 1 (outcome: KS2 Reading)

	(1) KS2 Reading		(2) KS2 Reading		(3) KS2 Reading	
Fixed Part:						
Treatment			0.02	(0.06)	0.02	(0.05)
School FSM%			-0.21**	(0.07)	0.03	(0.06)
School average KS2 score			0.34***	(0.07)	0.23***	(0.06)
school size small			ref.		ref.	
School size medium			-0.13	(0.09)	-0.10	(0.07)
school size large			-0.04	(0.09)	-0.02	(0.08)
Standardized KS1 Reading score					0.35***	(0.02)
Standardized KS1 Writing score					0.14***	(0.02)
Standardized KS1 Maths score					0.15***	(0.02)
Standardized KS1 Science score					0.07***	(0.02)
everFSM					-0.13***	(0.02)
Constant	0.02	(0.04)	-0.06	(0.09)	-0.08	(0.08)

Random Part:						
school: variance	0.13***	(0.02)	0.08***	(0.01)	0.06***	(0.01)
student: variance	0.86***	(0.02)	0.86***	(0.02)	0.47***	(0.01)
groups	116		116		116	
N	5286		5286		4966	
Deviance	14409.57		14363.35		10519.26	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.2: Multilevel modeling results for part 1 (outcome: KS2 Numeracy)

	(1)		(2)		(3)	
	KS2 Numeracy		KS2 Numeracy		KS2 Numeracy	
Fixed Part:						
Treatment			0.05	(0.07)	0.04	(0.06)
School FSM%			-0.11	(0.08)	0.15*	(0.07)
School average KS2 score			0.28***	(0.08)	0.17*	(0.07)
school size small			ref.		ref.	
School size medium			0.08	(0.10)	0.06	(0.08)
school size large			0.22*	(0.10)	0.20*	(0.09)

Standardized KS1 Reading score					0.01	(0.02)
Standardized KS1 Writing score					0.14***	(0.02)
Standardized KS1 Maths score					0.56***	(0.02)
Standardized KS1 Science score					0.03*	(0.01)
everFSM					-0.12***	(0.02)
Constant	-0.02	(0.04)	-0.29**	(0.10)	-0.30**	(0.09)
Random Part:						
School: variance	0.14***	(0.02)	0.11***	(0.02)	0.10***	(0.01)
Student: variance	0.86***	(0.02)	0.86***	(0.02)	0.42***	(0.01)
groups	116		116		116	
N	5331		5331		5000	
Deviance	14559.13		14537.72		10141.43	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.3 Multilevel modeling results for part 1 (outcome: KS2 GPS)

	(1)		(2)		(3)	
	KS2 GPS		KS2 GPS		KS2 GPS	
Fixed Part:						
Treatment			0.07	(0.07)	0.07	(0.06)
School FSM%			-0.19*	(0.08)	0.05	(0.07)
School average KS2 score			0.22**	(0.08)	0.07	(0.08)
school size small			ref.		ref.	
schoolsize==medium			0.11	(0.10)	0.16	(0.09)
school size large			0.23*	(0.10)	0.28**	(0.09)
Standardized KS1 Reading score					0.33***	(0.02)
Standardized KS1 Writing score					0.30***	(0.02)
Standardized KS1 Maths score					0.16***	(0.02)
Standardized KS1 Science score					0.02	(0.01)
everFSM					-0.10***	(0.02)
Constant	-0.02	(0.04)	-0.25*	(0.11)	-0.28**	(0.09)
Random Part:						

School: variance	0.15***	(0.02)	0.12***	(0.02)	0.11***	(0.02)
Student: variance	0.85***	(0.02)	0.85***	(0.02)	0.35***	(0.01)
groups	116		116		116	
N	5325		5325		4997	
Deviance	14477.07		14455.94		9233.19	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.4 Multilevel modeling results for part 1 (interaction: Treatment *everFSM)

	(1)		(2)		(3)	
Outcome	KS2 Reading		KS2 Numeracy		KS2 GPS	
Fixed Part:						
Standardized KS1 Reading score	0.35***	(0.02)	0.01	(0.02)	0.33***	(0.02)
Standardized KS1 Writing score	0.14***	(0.02)	0.14***	(0.02)	0.30***	(0.02)
Standardized KS1 Maths score	0.15***	(0.02)	0.56***	(0.02)	0.16***	(0.02)
Standardized KS1 Science score	0.07***	(0.02)	0.03*	(0.01)	0.02	(0.01)
School FSM%	0.03	(0.06)	0.15*	(0.07)	0.05	(0.07)
School average KS2 score	0.23***	(0.06)	0.17*	(0.07)	0.07	(0.08)
school size small	ref.		ref.		ref.	
School size medium	-0.10	(0.07)	0.06	(0.08)	0.15	(0.09)
school size large	-0.02	(0.08)	0.20*	(0.09)	0.28**	(0.09)
Treatment	0.01	(0.06)	0.04	(0.06)	0.05	(0.07)
everFSM	-0.15***	(0.03)	-0.11***	(0.03)	-0.13***	(0.03)

Treatment X everFSM	0.03	(0.05)	-0.02	(0.04)	0.06	(0.04)
Constant	-0.08	(0.08)	-0.30***	(0.09)	-0.26**	(0.09)
Random Part:						
School: variance	0.06***	(0.01)	0.10***	(0.01)	0.10***	(0.02)
Student: variance	0.47***	(0.01)	0.42***	(0.01)	0.35***	(0.01)
groups	116		116		116	
N	4966		5000		4997	
Deviance	10518.84		10141.26		9230.95	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.5 multilevel modeling results for part 1 (Schools with literacy or numeracy focus vs Control group)

	(1) KS2 Reading		(2) KS2 Numeracy		(3) KS2 GPS	
Fixed Part:						
Standardized KS1 Reading score	0.35***	(0.02)	0.01	(0.02)	0.33***	(0.02)
Standardized KS1 Writing score	0.14***	(0.02)	0.14***	(0.02)	0.30***	(0.02)
Standardized KS1 Maths score	0.15***	(0.02)	0.56***	(0.02)	0.16***	(0.02)
Standardized KS1 Science score	0.07***	(0.02)	0.03*	(0.01)	0.02	(0.01)
School FSM%	0.03	(0.06)	0.15*	(0.07)	0.05	(0.07)
School average KS2 score	0.22***	(0.06)	0.18*	(0.08)	0.07	(0.08)
school size small	ref.		ref.		ref.	
Schoolsize medium	-0.10	(0.07)	0.07	(0.09)	0.16	(0.09)
school size large	-0.02	(0.08)	0.21*	(0.09)	0.28**	(0.09)
everFSM	-0.13***	(0.02)	-0.12***	(0.02)	-0.10***	(0.02)
Project Focus Literacy	0.02	(0.06)	0.03	(0.07)	0.06	(0.07)
Project Focus Numeracy	-0.01	(0.11)	0.09	(0.13)	0.11	(0.13)

Constant	-0.08	(0.08)	-0.31***	(0.09)	-0.28**	(0.10)
Random Part:						
School: variance	0.06***	(0.01)	0.10***	(0.01)	0.11***	(0.02)
Student: variance	0.47***	(0.01)	0.42***	(0.01)	0.35***	(0.01)
groups	116		116		116	
N	4966		5000		4997	
Deviance	10519.16		10141.17		9233.08	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.6 Multilevel modeling results for part 2 (teacher survey measures in use analysis, outcome: KS2 Reading Score)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Part:							
Standardized measure1 score	-0.00						0.03
	(0.02)						(0.03)
Standardized measure2 score		0.04					0.06*
		(0.02)					(0.03)
Standardized measure3 score			0.01				0.03
			(0.02)				(0.03)
Standardized measure4 score				-0.01			-0.00
				(0.02)			(0.03)
Standardized measure5 score					0.02		0.00
					(0.02)		(0.02)
Standardized measure6 score						-0.00	-0.02
						(0.02)	(0.02)
everFSM	-0.13***	-0.13***	-0.09**	-0.09**	-0.09**	-0.09**	-0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Standardized KS1 Reading score	0.33***	0.33***	0.00	0.00	0.00	0.00	0.00
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Writing score	0.15***	0.15***	0.17***	0.17***	0.17***	0.17***	0.16***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Science score	0.07***	0.07***	0.01	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)

Standardized KS1 Maths score	0.17***	0.17***	0.57***	0.57***	0.57***	0.57***	0.57***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.04	0.04	0.03	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Random Part:							
School: variance	0.07***	0.07***	0.11***	0.11***	0.11***	0.11***	0.11***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Student: variance	0.45***	0.45***	0.42***	0.42***	0.42***	0.42***	0.42***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
groups	82	82	82	82	82	82	82
N	2871	2871	2886	2886	2886	2886	2886
Deviance	5997.28	5994.54	5851.98	5851.94	5851.52	5852.02	5842.25

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.7 Multilevel modeling results for part 2 (teacher survey measures in use analysis, outcome: KS2 Numeracy Score)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Part:							
Standardized measure1 score	0.04						0.03
	(0.02)						(0.03)
Standardized measure2 score		0.06*					0.06*
		(0.02)					(0.03)

Standardized measure3 score			0.01				0.03
			(0.02)				(0.03)
Standardized measure4 score				-0.01			-0.00
				(0.02)			(0.03)
Standardized measure5 score					0.02		0.00
					(0.02)		(0.02)
Standardized measure6 score						-0.00	-0.02
						(0.02)	(0.02)
everFSM	-0.09**	-0.09**	-0.09**	-0.09**	-0.09**	-0.09**	-0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Standardized KS1 Reading score	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Writing score	0.17***	0.16***	0.17***	0.17***	0.17***	0.17***	0.16***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Science score	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Maths score	0.57***	0.57***	0.57***	0.57***	0.57***	0.57***	0.57***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.04	0.03	0.03	0.04	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Random Part:							
School: variance	0.11***	0.11***	0.11***	0.11***	0.11***	0.11***	0.11***

	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Student: variance	0.42***	0.42***	0.42***	0.42***	0.42***	0.42***	0.42***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
groups	82	82	82	82	82	82	82
N	2886	2886	2886	2886	2886	2886	2886
Deviance	5848.69	5845.67	5851.98	5851.93	5851.51	5852.02	5842.25

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.8 Multilevel modeling results for part 2 (teacher survey measures in use analysis ,outcome: KS2 GPS Score)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Part:							
Standardized measure1 score	0.05*						0.04
	(0.02)						(0.03)
Standardized measure2 score		0.06**					0.06*
		(0.02)					(0.03)
Standardized measure3 score			0.01				0.03
			(0.02)				(0.03)
Standardized measure4 score				0.01			0.02
				(0.02)			(0.02)
Standardized measure5 score					0.03		0.03
					(0.02)		(0.02)
Standardized measure6 score						-0.01	-0.04

						(0.02)	(0.02)
everFSM	-0.09**	-0.09**	-0.09**	-0.09**	-0.08**	-0.09**	-0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Standardized KS1 Reading score	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Writing score	0.31***	0.31***	0.31***	0.31***	0.31***	0.31***	0.31***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Science score	-0.00	-0.01	-0.00	-0.01	-0.01	-0.01	-0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Standardized KS1 Maths score	0.19***	0.19***	0.18***	0.18***	0.18***	0.18***	0.18***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.03	0.03	0.03	0.03	0.03	0.03	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Random Part:							
School: variance	0.11***	0.11***	0.10***	0.10***	0.11***	0.10***	0.11***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Student: variance	0.35***	0.35***	0.35***	0.35***	0.35***	0.35***	0.35***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
groups	82	82	82	82	82	82	82
N	2886	2886	2886	2886	2886	2886	2886
Deviance	5347.02	5345.86	5351.85	5352.08	5349.81	5352.08	5336.46

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.9 Multilevel modeling results for part 2 (dosage analysis)

	(1) KS2 Reading Score		(2) KS2 GPS Score		(3) KS2 Numeracy Score	
Fixed Part:						
centered workshop attendance (treatment dosage)	0.01	(0.00)	0.01	(0.00)	0.01	(0.01)
School FSM%	-0.02	(0.06)	-0.02	(0.07)	0.12	(0.07)
School average KS2 score	0.18**	(0.07)	0.05	(0.07)	0.15*	(0.08)
School size small	ref		ref		ref	
School size medium	-0.06	(0.08)	0.21*	(0.09)	0.05	(0.09)
School size large	-0.02	(0.09)	0.33***	(0.09)	0.16	(0.10)
everFSM	-0.11***	(0.03)	-0.09***	(0.02)	-0.10***	(0.02)
Standardized KS1 Reading score	0.35***	(0.02)	0.33***	(0.02)	0.01	(0.02)
Standardized KS1 Writing score	0.15***	(0.02)	0.32***	(0.02)	0.16***	(0.02)
Standardized KS1 Science score	0.07***	(0.02)	-0.00	(0.01)	0.02	(0.02)
Standardized KS1 Maths score	0.16***	(0.02)	0.17***	(0.02)	0.56***	(0.02)
Constant	-0.04	(0.08)	-0.26**	(0.09)	-0.23*	(0.09)

Random Part:						
School: variance	0.06***	(0.01)	0.09***	(0.01)	0.09***	(0.02)
Student: variance	0.48***	(0.01)	0.35***	(0.01)	0.42***	(0.01)
groups	104		104		104	
N	4131		4153		4152	
Deviance	8857.63		7705.61		8434.25	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.10 Multilevel modeling results for part 2 (teacher outcome analysis for measure 1: **Positive disposition to academic research in informing teaching practice**)

	(1) Standardized measure1 score		(2) Standardized measure1 score		(3) Standardized measure1 score	
Fixed Part:						
Treatment	0.21*	(0.10)	0.14	(0.09)		
School FSM%	-0.08	(0.10)	-0.06	(0.10)		
School average KS2 score	0.16	(0.11)	0.14	(0.10)		
school size small	ref.		ref.			
school size medium	-0.03	(0.13)	0.01	(0.13)		

school size large			-0.04	(0.14)	0.04	(0.13)
Classroom teacher					ref.	
Middle leader (e.g. head of department, subject or curriculum area leader)					0.34***	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					0.58***	(0.13)
Headteacher, principal or director					1.10***	(0.21)
SEN teacher					0.39	(0.42)
Supply, cover or PPA teacher					0.15	(0.25)
High level teaching assistant					0.86	(0.47)
Music or PE extra curricula teacher					-0.07	(0.47)
with postgraduate qualifications					0.47***	(0.13)
year of teaching					0.02	(0.04)
year of teaching in the school					-0.03	(0.04)
Constant	0.00	(0.05)	-0.12	(0.15)	-0.48*	(0.23)
Random Part:						
School: variance	0.05***	(0.03)	0.03***	(0.02)	0.03***	(0.02)

Student: variance	0.94	(0.05)	0.95	(0.05)	0.84**	(0.05)
groups	79		79		79	
N	699		699		699	
Deviance	1974.12		1963.08		1884.70	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.11 Multilevel modeling results for part 2 (teacher outcome analysis for measure 2: **Use of academic research to inform selection of teaching approaches**)

	(1)		(2)		(3)	
	Standardized measure2 score		Standardized measure2 score		Standardized measure2 score	
Fixed Part:						
Treatment			0.20*	(0.10)	0.13	(0.10)
School FSM%			-0.04	(0.11)	0.02	(0.10)
School average KS2 score			0.12	(0.11)	0.12	(0.11)
school size small			ref.		ref.	
school size medium			-0.05	(0.14)	0.01	(0.13)
school size large			-0.14	(0.14)	-0.08	(0.14)

Classroom teacher					ref.	
Middle leader (e.g. head of department, subject or curriculum area leader)					0.22**	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					0.25	(0.13)
Headteacher, principal or director					1.25***	(0.21)
SEN teacher					0.46	(0.43)
Supply, cover or PPA teacher					0.19	(0.25)
High level teaching assistant					0.67	(0.47)
Music or PE extra curricula teacher					-0.50	(0.47)
with postgraduate qualifications					0.18	(0.13)
year of teaching					0.07	(0.04)
year of teaching in the school					0.00	(0.04)
Constant	0.01	(0.05)	-0.06	(0.15)	0.02	(0.24)
Random Part:						
School: variance	0.06***	(0.03)	0.04***	(0.02)	0.04***	(0.02)
Student: variance	0.94	(0.05)	0.94	(0.05)	0.84**	(0.05)

groups	79	79	79
N	699	699	699
Deviance	1972.93	1963.66	1888.56

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.12 Multilevel modeling results for part 2 (teacher outcome analysis for measure 3: **Perception that academic research is not useful to teaching**)

	(1)	(2)		(3)	
	Standardized measure3 score	Standardized measure3 score		Standardized measure3 score	
Fixed Part:					
Treatment		-0.17	(0.09)	-0.13	(0.09)
School FSM%		0.16	(0.10)	0.11	(0.10)
School average KS2 score		-0.02	(0.10)	-0.03	(0.10)
school size small		ref.		ref.	
school size medium		-0.01	(0.13)	-0.04	(0.13)
school size large		-0.12	(0.13)	-0.16	(0.13)
Classroom teacher				ref.	

Middle leader (e.g. head of department, subject or curriculum area leader)					-0.22*	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					-0.41**	(0.13)
Headteacher, principal or director					-0.95***	(0.21)
SEN teacher					0.51	(0.44)
Supply, cover or PPA teacher					0.11	(0.26)
High level teaching assistant					-0.55	(0.49)
Music or PE extra curricula teacher					-0.27	(0.48)
with postgraduate qualifications					-0.04	(0.13)
year of teaching					-0.05	(0.04)
year of teaching in the school					0.02	(0.05)
Constant	-0.01	(0.04)	0.06	(0.14)	0.15	(0.24)
Random Part:						
School: variance	0.03***	(0.02)	0.02***	(0.02)	0.02***	(0.02)
Student: variance	0.97	(0.05)	0.97	(0.05)	0.91	(0.05)
groups	79		79		79	

N	699	699	699
Deviance	1979.76	1972.03	1927.96

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.13 Multilevel modeling results for part 2 (teacher outcome analysis for measure 4: **Perception that own school does not encourage use of academic research**)

	(1) Standardized measure4 score		(2) Standardized measure4 score		(3) Standardized measure4 score	
Fixed Part:						
Treatment	-0.11	(0.11)			-0.07	(0.11)
School FSM%	0.22	(0.12)			0.16	(0.12)
School average KS2 score	-0.05	(0.12)			-0.07	(0.12)
school size small	ref.				ref.	
school size medium	0.23	(0.14)			0.22	(0.14)
school size large	0.06	(0.15)			0.08	(0.15)
Classroom teacher					ref.	

Middle leader (e.g. head of department, subject or curriculum area leader)					-0.04	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					-0.25	(0.13)
Headteacher, principal or director					-0.53*	(0.21)
SEN teacher					0.30	(0.43)
Supply, cover or PPA teacher					0.16	(0.26)
High level teaching assistant					-0.57	(0.48)
Music or PE extra curricula teacher					-0.23	(0.48)
with postgraduate qualifications					0.13	(0.13)
year of teaching					-0.01	(0.04)
year of teaching in the school					-0.10*	(0.05)
Constant	0.00	(0.05)	-0.14	(0.16)	-0.54*	(0.25)
Random Part:						
School: variance	0.10***	(0.03)	0.07***	(0.03)	0.07***	(0.03)
Student: variance	0.90	(0.05)	0.90	(0.05)	0.87*	(0.05)
groups	79		79		79	

N	699	699	699
Deviance	1961.21	1950.85	1923.88

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.14 Multilevel modeling results for part 2 (teacher outcome analysis for measure 5: **Active engagement with online evidence platforms**)

	(1)		(2)		(3)	
	Standardized measure5 score		Standardized measure5 score		Standardized measure5 score	
Fixed Part:						
Treatment			0.12	(0.09)	0.06	(0.09)
School FSM%			-0.14	(0.10)	-0.10	(0.10)
School average KS2 score			-0.07	(0.10)	-0.07	(0.10)
school size small			ref.		ref.	
school size medium			-0.06	(0.13)	-0.05	(0.12)
school size large			-0.05	(0.13)	-0.04	(0.13)
Classroom teacher					ref.	
Middle leader (e.g. head of department, subject or curriculum area leader)					0.20*	(0.09)
Senior leader (e.g. deputy or assistant headteacher)					0.54***	(0.13)

Headteacher, principal or director					1.16***	(0.21)
SEN teacher					0.81	(0.44)
Supply, cover or PPA teacher					-0.29	(0.26)
High level teaching assistant					0.26	(0.48)
Music or PE extra curricula teacher					-0.80	(0.48)
with postgraduate qualifications					-0.03	(0.13)
year of teaching					-0.04	(0.04)
year of teaching in the school					0.06	(0.05)
Constant	-0.00	(0.04)	0.10	(0.14)	0.03	(0.24)
Random Part:						
School: variance	0.02***	(0.02)	0.02**	(0.02)	0.02***	(0.02)
Student: variance	0.98	(0.06)	0.98	(0.05)	0.90	(0.05)
groups	79		79		79	
N	699		699		699	
Deviance	1981.28		1976.96		1920.89	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H.15 Multilevel modeling results for part 2 (teacher outcome analysis for measure 6: **Knowledge of research findings and methods**)

	(1)	(2)		(3)	
	Standardized measure6 score	Standardized measure6 score		Standardized measure6 score	
Fixed Part:					
Treatment		0.00	(0.10)	-0.09	(0.09)
School FSM%		-0.17	(0.11)	-0.10	(0.10)
School average KS2 score		0.00	(0.11)	-0.01	(0.10)
school size small		ref.		ref.	
school size medium		-0.11	(0.13)	-0.06	(0.13)
school size large		-0.18	(0.14)	-0.12	(0.13)
Classroom teacher				ref.	
Middle leader (e.g. head of department, subject or curriculum area leaderï¼‰				0.05	(0.08)
Senior leader (e.g. deputy or assistant headteacher)				0.41**	(0.13)
Headteacher, principal or director				1.28***	(0.20)
SEN teacher				0.19	(0.42)
Supply, cover or PPA teacher				-0.04	(0.25)

High level teaching assistant					-0.05	(0.47)
Music or PE extra curricula teacher					-0.98*	(0.47)
with postgraduate qualifications					0.39**	(0.13)
year of teaching					0.00	(0.04)
year of teaching in the school					-0.09*	(0.04)
Constant	0.01	(0.05)	0.20	(0.15)	0.43	(0.23)
School: variance	0.05***	(0.02)	0.03***	(0.02)	0.03***	(0.02)
Student: variance	0.95	(0.05)	0.95	(0.05)	0.84**	(0.05)
groups	79		79		79	
N	699		699		699	
Deviance	1976.47		1970.69		1881.36	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix I: Multilevel modelling syntax code

Al the syntax codes below were used in software Stata 14 (StataCorp, 2015)[6].

```
//Part 1

//KS2 reading score

eststo:  xtmixed stdKS2_READSCORE  || LAESTAB:, variance

eststo:  xtmixed stdKS2_READSCORE treatment  FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance

eststo:  xtmixed stdKS2_READSCORE treatment zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance

//*****************************************************************

eststo clear

//KS2 Maths score

eststo:  xtmixed stdKS2_MATSCORE  || LAESTAB:, variance

eststo:  xtmixed stdKS2_MATSCORE treatment  FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance

eststo:  xtmixed stdKS2_MATSCORE treatment zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance

//*****************************************************************


eststo clear

//KS2 GPS score

eststo:  xtmixed stdKS2_GPSSCORE  || LAESTAB:, variance

eststo:  xtmixed stdKS2_GPSSCORE treatment  FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance

eststo:  xtmixed stdKS2_GPSSCORE treatment zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 FSMsper KS2s schoolsize2 schoolsize3 || LAESTAB:,mle variance
```

[6] StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.

//FSM*treatment

eststo: xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 treatment##EVERFSM_ALL_SPR16|| LAESTAB:,mle variance

eststo: xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 treatment##EVERFSM_ALL_SPR16|| LAESTAB:,mle variance

eststo: xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 treatment##EVERFSM_ALL_SPR16|| LAESTAB:,mle variance

//literacy and numeracy focus

eststo: xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 EVERFSM_ALL_SPR16 literacyProFocus numberacyProFocus|| LAESTAB:,mle variance

eststo: xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 EVERFSM_ALL_SPR16 literacyProFocus numberacyProFocus|| LAESTAB:,mle variance

eststo: xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science FSMsper KS2s schoolsize2 schoolsize3 EVERFSM_ALL_SPR16 literacyProFocus numberacyProFocus|| LAESTAB:,mle variance

//Part2

//KS2 outcome

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef2|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef3|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef4|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef5|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef6|| y6t2_URN:, variance

eststo:xtmixed stdKS2_READSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1 stdaveragef2 stdaveragef3 stdaveragef4 stdaveragef5

stdaveragef6|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef2|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef3|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef4|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef5|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef6|| y6t2_URN:, variance

eststo:xtmixed stdKS2_MATSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1 stdaveragef2 stdaveragef3 stdaveragef4 stdaveragef5 stdaveragef6|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef2|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef3|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef4|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef5|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef6|| y6t2_URN:, variance

eststo:xtmixed stdKS2_GPSSCORE zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 stdaveragef1 stdaveragef2 stdaveragef3 stdaveragef4 stdaveragef5 stdaveragef6|| y6t2_URN:, variance

xtmixed stdKS2_READSCORE centered_attendence16 FSMsper KS2s schoolsizenew2 schoolsizenew3 zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 || y6t2_URN:, variance

xtmixed stdKS2_GPSSCORE centered_attendence16 FSMsper KS2s schoolsizenew2 schoolsizenew3 zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 || y6t2_URN:, variance

xtmixed stdKS2_MATSCORE centered_attendence16 FSMsper KS2s schoolsizenew2

schoolsizenew3 zKS1reading zKS1writing zKS1math zKS1science EVERFSM_ALL_SPR16 || y6t2_URN:, variance

//teacher outcome

xtmixed stdmeasure1||URN:,mle variance

xtmixed stdmeasure1 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure1 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

xtmixed stdmeasure2||URN:,mle variance

xtmixed stdmeasure2 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure2 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

xtmixed stdmeasure3||URN:,mle variance

xtmixed stdmeasure3 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure3 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

xtmixed stdmeasure4||URN:,mle variance

xtmixed stdmeasure4 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure4 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

xtmixed stdmeasure5||URN:,mle variance

xtmixed stdmeasure5 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure5 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

xtmixed stdmeasure6||URN:,mle variance

xtmixed stdmeasure6 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3||URN:,mle variance

xtmixed stdmeasure6 treatment FSMsper KS2s schoolsizenew2 schoolsizenew3 role82 role83 role84 role85 role86 role87 role88 qulification Q6 Q7||URN:,mle variance

//anova

anova meanm1new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

anova meanm2new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

anova meanm3new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

anova meanm4new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

anova meanm5new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

anova meanm6new schoolsizenewnew2 schoolsizenewnew3 KS2s FSMsper treatment round treat#round[aweight=freqnew] if school_pickone==1

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Education
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The Education Endowment Foundation
9th Floor, Millbank Tower
21–24 Millbank
London
SW1P 4QP
www.educationendowmentfoundation.org.uk