Education Endowment Foundation

Mind the Gap

Evaluation Report and Executive Summary

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The Education Endowment Foundation (EEF)

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The EEF aims 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.

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The trial was independently evaluated by a team from the National Institute of Economic and Social Research (NIESR). The lead evaluator was Richard Dorsett.

The process study was carried out by a team from Durham University, led by Kate Wall.

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Executive summary

The project

Mind the Gap sought to improve the metacognition and academic attainment of pupils in Year 4. There were two aspects to the intervention. The first involved training teachers in how to embed metacognitive approaches in their work, and how to continue to effectively and strategically involve parents. This training took place over a day and was provided by a consultant. The second component focused on parental engagement and offered families the opportunity to participate in a series of facilitated workshops where children and parents work together to create an animated film. Sessions were coordinated by a practitioner who helped participants to think about how they are learning, create learning goals and reflect on their progress; to be metacognitive about the learning process they were engaged in together. The families were offered 2 hours of workshops per week for 5 weeks (10 hours in total).

The project targeted schools in four areas of England: Birmingham, Devon, London and Manchester. It was delivered by the Campaign for Learning, with assessments carried out by Durham University. Delivery started in September 2012 and finished in October 2013.

The project was evaluated using a randomised controlled trial, which compared the interventions to a 'business-as-usual' control group. It is important to note that it was eligibility for the animation course, not participation, that was randomised, so the results must be regarded as estimating the effect of being offered the animation course (alone or in combination with teacher training, as appropriate) rather than participating in it.

Key conclusions

1. The headline findings provide no evidence of a statistically significant impact of Mind the Gap on attainment. There is not sufficient evidence to conclude that any observed effect was caused by the programme rather than occurring by chance.

2. The estimate of the programme's impact on pupils' metacognition was positive and statistically significant. This improvement in metacognition may in time lead to an impact on academic attainment.

3. Participating families and staff felt the intervention enhanced home–school relationships and strengthened the learning relationship between children and parents.

4. To increase the proportion of families who sign up to the animation course, it is important that schools clearly communicate its aims and promote the potential benefits of participation.

5. The difficulty in recruiting schools suggests that introducing Mind the Gap more generally may be difficult where schools are not committed to parental engagement or where they have difficulty delivering activities out of hours.

What impact did it have?

The impact analysis considered the effect of Mind the Gap as a whole, as well as the separate effects of the teacher training component and eligibility for the parental engagement intervention. InCAS tests of reading, general maths and mental arithmetic were administered six months after the intervention. The intervention had no statistically significant effect on the primary outcome, a combined reading and numeracy score, so we do not have sufficient evidence to conclude that any observed effect was caused by the programme rather than occurring by chance. This was also true for the subgroup of pupils eligible for free school meals.

A number of secondary outcomes were also considered. These included reading, general maths and mental arithmetic scores as well as a measure of how children felt about the relationship with their parents (constructed using their responses to questions taken from the Self-Description Questionnaire). These estimates were consistent in showing no statistically significant effect. However, measures of metacognition (elicited from data collected using Pupil Views Templates) provided evidence that eligibility for the animation course increased pupils' 'productive thinking' and 'metacognitive skilfulness'.

Group	No. of pupils	Effect size (95 confidence intervals) *	Estimated months' progress	Is this finding statistically significant?	Evidence strength **	Cost of approach ***
Mind the Gap overall effect (all pupils)	492	-0.141 (-0.697, 0.414)	-2	No	🔒	££
Teacher training alone	278	0.009 (-1.119, 1.137)	0	No		
Parental engagement offer alone	186	-0.252 (-0.576, 0.071)	-3	No		
Mind the Gap overall effect (FSM pupils)	123	-0.265 (-1.332, 0.801)	-4	No		

* Effect sizes with confidence intervals that pass through 0 are not 'statistically significant', so we do not have sufficient evidence to conclude that the observed effect was caused by the programme rather than occurring by chance.
** For more information about evidence ratings, see Appendix XIV in the main evaluation report.
Evidence ratings are not provided for subgroup analyses, which will always be less secure than overall findings
*** For more information about cost ratings, see Appendix XV in the main evaluation report.

How secure is this finding?

Overall the evaluation findings are judged to be of low security, largely due to the high degree of attrition.

Mind the gap was evaluated using a randomised controlled trial. Participating schools were randomised to a 'business-as-usual' control group or an intervention group, which received the teacher training element. Within the intervention group, Year 4 classes were then randomised into a further two groups: one that were eligible to participate in the animation course and a group that were not. This design allowed three effects to be estimated:

- the overall effect of Mind the Gap
- the effect of teacher training alone
- the effect of eligibility for the animation course.

It was eligibility for participation in the animation course that was randomised. Participation in the course was very low: 72% of pupils eligible for the animation course did not attend any sessions. The results must therefore be regarded as estimating the effect of eligibility for the animation course (alone or in combination with teacher training, as appropriate) rather than participation in it.

In practice, implementation difficulties raised concerns about the security of the results. The main problem was the high level of dropout and the fact that this was concentrated among control schools. There was no means of including such schools in the analysis since they provided no outcome data. A comparison of baseline characteristics suggests that there may be some degree of imbalance across experimental arms in the sample used for analysis, but these comparisons themselves are made difficult by the high incidence of missing baseline data. Furthermore, among schools that did not drop out, there were missing outcome data, compounding the problem caused by dropout.

Another limitation is that, in practice, the treatment status of classes within schools did not agree in all cases with the randomised status. Such non-compliance is a common feature of randomised controlled trials and generally one can still adhere to the intent to treat (ITT) principle. However, in several cases the randomised status became meaningless in practice, as the teachers who were randomised (in most cases, classes were identified by their teacher) had left the school. The final analysis used de facto treatment status. This is a deviation from ITT and further reduces the extent to which the impact estimates for the components of Mind the Gap can be viewed as experimental.

Existing evidence suggests that metacognition and parental engagement interventions have a high average impact on attainment. However, these interventions can take many forms and the intervention considered in this project has no directly comparable precedent.

How much does it cost?

For schools that already have the required IT hardware, delivery of the animation course for up to 15 families costs in the region of £1,950. This translates into a per child cost of roughly £130. The cost of teacher training was typically an additional £195 per delegate.

Cost Item	Cost per pupil
Salary costs	£60
Resources*	£47
Administration	£11
Other **	£12
TOTAL	£130

*maximum cost: includes software licence and webcams package
**facilitator travel – variable depending on location

1. Introduction

Mind the Gap seeks to create better learners by harnessing the power of effective metacognition strategies. This is based on the idea that effective learning depends on skills, attitudes and dispositions to learning, and that these can themselves be learned.

There is evidence to suggest that metacognitive approaches may be effective at raising pupils' academic attainment. Furthermore, it is not just teachers who can help children to improve their learning skills. Parental engagement is potentially important; giving parents the skills to help their children to become confident, motivated learners could make a big difference to their performance at school.

1.1 Intervention

There are two aspects to the intervention. The first involves one full day of training for school staff (usually class teachers) in how to embed metacognitive approaches in their work, and how to continue to effectively and strategically involve parents. The second is the parental engagement component which offers families the opportunity to participate in a series of facilitated workshops. These workshops run for 10 hours in total (2 hours per week over 5 weeks) and involve children and their parents working together to create an animated film. Sessions are coordinated by a practitioner who helps participants to think about how they are learning, creating learning goals and reflecting on their progress.[1] As far as possible, the format of the course was standardised across schools.

1.2 Background evidence

Mind the Gap is a family learning project aiming to facilitate intergenerational engagement with learning and to build learning skills in families. The project builds on a small-scale pilot project completed by the Campaign for Learning (CfL) in Harrow that showed encouraging results (unpublished). Among the 40 participating primary school pupils, the percentage achieving the government's expected level of progress in English rose from 15% to 73%.

Implicit in the project is reflective and strategic thinking (Moseley et al. 2005) that helps to make the process of learning explicit, facilitating the development of participants' metacognitive awareness (Flavell 1979). The animation project targets children and their fathers or male guardians. It is accompanied by staff development to promote the same metacognitive strategies (Wall et al. 2010) across the curriculum and home–school boundaries.

Pedagogies that prioritise the development of metacognitive knowledge and skilfulness have become increasingly common in English schools (Wall et al. 2010). Focusing on the key ideas of 'thinking about your thinking' and drawing on theoretical and pedagogic traditions (such as learning to learn, thinking skills, self-regulation, habits of mind, dispositions, self-efficacy and self-esteem in relation to learning), concepts are fluid, reacting to the pedagogic and policy environment (Wall 2010). In previous projects, run under the heading of 'Learning to Learn', also coordinated by the CfL (Wall et al. 2010), it was found to be very important to find the 'space' (time, environment, inspiration and suitable challenges stimulus) for all participants (teachers and students) to voice perspectives on learning (Wall 2012). In addition, many teachers saw the relevance of extending these pedagogies and enhancing metacognitive development across home–school boundaries (Hall et al. 2005).

Research on family learning shows that, once socio-economic status is accounted for, the biggest influence on children and young people's motivation and attainment is parental support (for example, Desforges and Abouchaar 2003; Harris and Goodall 2007). But what this parental engagement looks

[1] The name of the animation project is 'Animate Learning'.

like is up for debate; there is much variation in the type of intervention and therefore the impact and process that is studied. Most research in the field is concerned with literacy development (for example, Wade and Moore 2000; Wagner et al. 2002). However, many of these family literacy programmes have been criticised for having a dominant 'deficit discourse' (Anderson et al. 2010: 41) in which parents and guardians are seen as inadequate in or hindering learning. In some cases, the process can even be described as one of surveillance (Crozier 1998). Wolfendale (1996) suggested that projects should instead support parents to become integrated with school processes, curriculum and teaching and learning approaches, while others talk about partnership working, which suggests schools and parents working on an equal footing, pooling their expertise and applying this within a project.

Involvement in family learning projects can also have a positive effect on parent learning identity (Swain et al. 2014) and an explicit focus on the parent's needs can increase impact (van Steensel et al. 2011). Previous projects have found an increase in parents' metacognitive awareness (Wall et al. 2009). As a result, in Mind the Gap there has been a strategic refocusing of the initiative away from an explicit family–school relationship towards a partnership approach which focuses on learning and involves the child more explicitly. The focus is on the learning experience rather than anything more school-led or formal, with teachers and school 'stepping back' but providing a supportive role which allows learning to happen and be recognised between parent and child.

Another key feature of Mind the Gap is the focus on fathers and male guardians, who tend to be reluctant, absent or ignored in the majority of family learning programmes (Macleod 2008; Freeman et al. 2008). Yet the research shows that when fathers do have high levels of involvement or interest in their child's education (Nord et al. 1998; Flouri and Buchanan 2004; Roopnarine et al. 2006) there is greater progress, more positive attitudes and higher expectations (for example, Hill and Taylor 2004; Goldman 2005).

The intervention is relevant to the government policy of raising the achievement of disadvantaged pupils. It also promotes parental engagement and involvement in children's education, as advocated by Ofsted. It provides early intervention for pupils who are not achieving their full potential. It contributes to the literacy agenda in its aims to develop literacy skills of pupils who are required to complete written work and contribute to verbal discussions. The programme also supports wider digital literacy and digital inclusion agendas.

As described above, there has been a large amount of research into metacognition and the importance of parental engagement. However, robust evidence on the effectiveness of discrete interventions is limited. This evaluation was intended to provide robust evidence on the effectiveness of one such intervention. As such, it builds on the pilot study in Harrow (mentioned above) and complements the understanding achieved to date of Mind the Gap (Wall et al., in press). The evaluation was set up as an effectiveness trial, aiming to test whether the intervention can work at scale in a large number of schools.

1.3 Evaluation objectives

The evaluation was designed to assess the impact on children's attainment, their feelings about their relationship with their parents and their metacognition of:

1. Mind the Gap as a whole (that is, both the Parental Engagement offer and the Teacher Training components – PETT)
2. Eligibility for the parental engagement element of Mind the Gap (PE)
3. The teacher training element of Mind the Gap (TT).

The process study was intended to assess implementation of the programme in practice and also to identify conditions required for successful delivery. Qualitative analysis was included to assess stakeholders' opinions of the intervention.

1.4 Project team

The intervention was delivered by the CfL, a UK-based education charity which developed the initial idea for the project. CfL were also responsible for recruiting schools to the study. Durham University carried out the initial sample size calculations and was responsible for administering all tests. Due to the pre-existing relationship between Durham University and CfL, it was necessary to appoint an independent evaluation team. NIESR led the independent evaluation, agreeing the research design, refining the randomisation approach, randomising the schools and classes and carrying out the impact analysis. Durham University led the process study and qualitative analysis, with oversight and advice on research instruments from NIESR.

1.5 Ethical review

The project was considered and approved by the ethics committee at Durham University School of Education.

CfL were responsible for school recruitment with support from Durham University. They made individual contact with each school and provided a full explanation of the evaluation during scheduled set-up meetings. Head teachers were asked to give signed consent for their school to take part (Appendix 3). In signing up for the project, schools were fully aware that they were giving consent for the evaluation to take place and what this would involve. Training sessions reinforced and elaborated on the content of the evaluation, and provided opportunities for further questions, written information and contact details for the research team. Members of the research team from Durham University attended these training sessions and ensured they were available to answer ethical queries at any time via email or telephone.

A frequently asked questions sheet and a letter for parents and carers concerning the evaluation which schools could choose to use (or not) were produced (Appendix 4). This outlined the nature of the evaluation, the measures to be used and the data protection standards that would be adhered to.

An initial parent/carer registration form sought photographic and video consent and was accompanied by safeguarding information, including a disclaimer that data would be stored in accordance with the Data Protection Act and used only by Durham University and its project partners (Appendix 5). This form was revised as the project developed and the longitudinal data and links to the NPD become more prominent within the project design. This new form was sent out to all participant parents accompanied by an explanatory letter from the University for parents (Appendix 6).

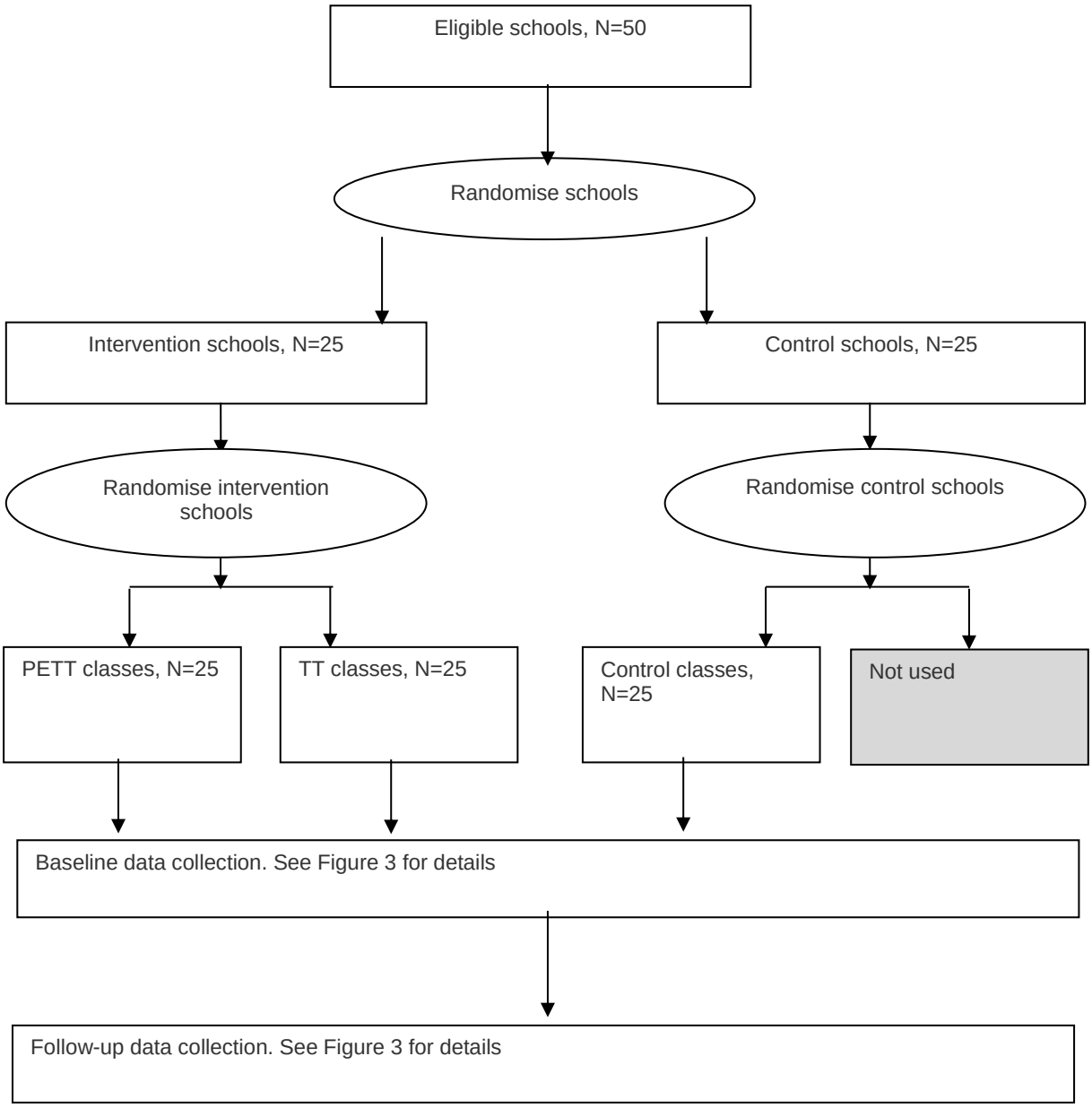
Where families were interviewed they gave specific signed consent for this, having been provided with a letter explaining the research as well as interview questions in advance of the interview.

2. Methodology

2.1 Trial design

A cluster randomisation approach was adopted since individual-level randomisation was felt to be impractical, likely to cause contamination and to raise ethical concerns. As shown in Figure 1, randomisation was at both the school level and the class level. Doing this allowed the three impacts listed as evaluation objectives to be estimated.

Figure 1. Trial design



Schools participating in the trial were randomly assigned to either the intervention group or a control group. Teachers in intervention schools received training to embed techniques for developing

metacognition in their work. Furthermore, eligibility for the animation course was randomly assigned among Year 4 classes in intervention schools. Year 4 was chosen as it is a primary age year group that is not involved in national testing processes, but which normally achieves a good level of literacy development, thereby allowing appropriate responses to the outcome and process measures used in this study.

This assignment approach results in three types of Year 4 classes being included in the trial:

1. classes in intervention schools that are eligible for the animation course – PETT classes
2. classes in intervention schools that are not eligible for the animation course – TT classes
3. classes in control schools.

2.2 Eligibility

Eligible schools were from Devon, London Borough of Haringey, Birmingham and Manchester considered to be located in areas of substantial socio-economic deprivation with a high proportion of children receiving free school meals. Schools with at least two form entry were targeted but this was not always possible, particularly in rural areas. It was expected that the majority of schools taking part would be achieving expected pupil attainment (Key Stage 2 floor standards) in English and maths for less than 70% of their pupils. However, as some schools were recruited through clusters and networks, a minority of schools were achieving attainment above these targets. Year 4 pupils were eligible to take part in the project, with the addition of some Year 3 and Year 5 pupils taking part if the school had mixed-age classes. Siblings were also eligible to attend family animation sessions.

School-level consent was sought before randomisation on a verbal basis from the head teacher. This was completed as part of the initial set-up meeting. The project design, the evaluation and its key structures were made clear at this point as well as the nature of the intervention and data collection. Once verbal agreement was reached, a written consent form was sent out (with non-return presumed to be acceptance).

Consent was sought from families via the parent registration form. The key purpose of this document was to capture socio-economic data relating to the broader family but the form also required the parent to give consent for participation in the project data collection.

2.3 Intervention

The Mind the Gap intervention included two key elements: eligibility to participate in the animation project and the staff development input.

Animation project: This consisted of five sessions (10 hours in total, 2 hours per week for 5 weeks) where children and their parents worked together to create an animated film. The sessions usually took place in school after the end of the school day. They were coordinated by a practitioner, employed and trained by the CfL. These practitioners helped participants to consider and reflect upon how they were learning. Where possible, a class teacher was also present during the sessions. This requirement was made clear by the CfL in the school's introduction to the project but was not always met, due to varying levels of commitment and capacity. The child invited their parent or guardian to take part in the project through drawing a 'wanted poster'; thus the contract was immediately suggested to be between the child and the adult without the school's explicit involvement. The target was fathers or male guardians, but where this was not possible the child invited an adult of their choice.

The animation project itself was designed around three core tools to ensure consistency:

- A presentation leading each facilitator through the five sessions. This included activities, films and prompts to ensure the same focus on metacognition and so that the same animation-based activities were covered.
- A family handbook given to all participant family groups, including information and activities for each session linked to the presentation.
- A teachers' handbook given to the teachers of the participant classes including, as above, information and guidance on each session linked to the presentation.

The five sessions were carefully designed to encompass elements such as story planning, modelling, trialling the equipment, exploring different animation techniques, filming, and editing. Each element was matched to one of the 5Rs (a learning dispositions framework) developed by CfL[2]: Readiness, Resourcefulness, Resilience, Responsibility and Reflectiveness (Wall et al. 2010). The progression through the programme was carefully mapped to ensure that the metacognitive elements and the animation process were closely associated and therefore maximised opportunities for transfer. This process was standardised using a number of resources including goal and reflection sheets that allowed the families to record their learning experiences.

Session	Metacognition focus	What happens
1	Readiness	• Introduction from facilitator • Show of previously made films • Introduction to metacognition • Use modelling clay to consider 'what kind of learner am I?' • Experimenting with animation technology • Complete goal and reflection sheets
2	Resourcefulness	• Frequently described as 'creative' activity by facilitators • Story planning using templates • Use craft materials to make sets and characters • Complete goal and reflection sheets
3	Responsibility	• The most technical session in which families need to get to grips with the software • Complete model making • Start filming • Complete goal and reflection sheets
4	Resilience	• Continue to use the software to make the film • Adjust models and storyboard to fit practical constraints of filming and project timings • Complete goal and reflection sheets
5	Reflection	• Finish films • Add sound and credits • Share films with the wider group • Reflection on what has been learned/achieved • Complete goal and course reflection sheets

Staff development: All intervention schools were invited to send two teachers to a regional training day led by Jackie Beere, an independent consultant with established expertise in the field of Learning to Learn, working in partnership with CfL. This day's training focused on how to embed approaches for developing metacognition in their work, and how to develop a strategic approach to effective parental engagement. The training covered why metacognitive development is important, including some of the

[2] http://www.campaign-for-learning.org.uk/cfl/learninginschools/l2l/5rs.asp

theoretical background in this area, as well as a practical consideration of requirements in individual school contexts, enabling teachers to apply their learning to their own work. Teachers were also provided with access to resources and references to use in school.

Control schools formed a waiting list and became eligible for both elements of the intervention in the following academic year. Eligibility for the animation project again comprised Year 4 classes, a cohort of pupils one year younger than those involved in the trial. This goes some way to ensuring a long-term control group. However, it may still be the case that the longer-term outcomes of trial participants in control schools are affected by the teacher training provided later.

Fidelity was a prime consideration throughout the project. CfL has a negotiated, partnership approach to working. The standardisation desired for this evaluation was a challenge both in regard to how the project was implemented in schools and how the schools interacted with the intervention. Standardisation was negotiated prior to the intervention going live. All facilitators were involved in the production of the presentation and handbooks for the animation project. They also attended at least one of the staff training days so that parallels could be drawn wherever possible. This strengthened fidelity of the intervention as it was rolled out, ensuring all members of the team were up to date on the different elements of the project.

The Durham team undertook fidelity checks. These included:

- Random spot checks of implementation (staff training days, animation project sessions and data collection elements)
- Facilitator diaries of implementation
- Detailed examination of three schools' experiences of the intervention, including video recording of all sessions.

The main challenges to fidelity arose from:

- Changes in school staff – difficulties associated with this were largely overcome via consistent use of course materials: handbook, films and course structure
- Specific aspects of different school environments, including
    - Scheduling of the animation project within or outside the normal school day
    - The role and commitment of the staff member allocated to the project
    - The classroom environment allocated to the project
    - Communication about the project by the lead contact to other staff members, students and families.

2.4 Outcomes

The primary outcome measure was pupil attainment in literacy and numeracy, as captured by InCAS assessments. This was constructed as a combination of three InCAS measures: reading, general maths and mental arithmetic.[3] These component measures were treated as secondary outcomes, alongside a measure of pupils' feelings about their relationship with their parents (recorded using a subset of the Self-Description Questionnaire (SDQ; Marsh1992) and their metacognition (captured using a Pupil Views Template (PVT).[4] Further details about each of these are provided below.

[3] The primary outcome was calculated as:
(reading score + (general maths score + mental arithmetic score)/2)/2.
in order to give equal weight to reading and numeracy.

[4] The data collected in the course of the trial contain the required identifiers to link to the National Pupil Database (NPD). Doing so would allow the impact on longer-term outcomes (Key Stage results) to be estimated.

- **InCAS**[5]: a diagnostic, computer-adaptive assessment tool used to measure reading (word recognition, word decoding, comprehension and spelling) and mathematics (general mathematics and mental arithmetic) attainment. These tests were chosen due to their suitability for primary aged children, their administration via computer program (which increases fidelity) and their established credibility within practice and research communities. The measure used was pre-test and 6 months delayed post-test age-equivalent score. The scores are measured in months. Pupils performing as expected for their age, will, on average, have an age-equivalent score equal to their chronological age. Pupils performing below (above) expectations will have an age-equivalent score below (above) their chronological age.

- **SDQ**: one factor was extracted from the SDQ to measure changes in pupils' beliefs about their relationship with their parents. This is an established instrument for use with primary aged children. The single factor was extracted from the wider questionnaire for ease of administration – 9 questions rather than 62. This measure was administered three times: pre-test, immediately post-test and 6 months post-test. The analysis combined component SDQ responses into a Likert score. Valid responses were recoded to run from 0 to 3 (instead of 1 to 4) and then summed. Given the negative and different wording, the second SDQ question[6] was excluded from the calculation of the Likert score. Low scores suggest that the child views the relationship with his/her parents as being '*more problematic/worse*', while higher scores suggest the child views it as '*less problematic/better*'.

- **PVTs**: pupil views templates were used to measure pupils' metacognitive awareness. This method – developed by one of the co-authors of this report (Wall and Higgins 2006) – is a visual tool using a cartoon image of a learning scenario the students will recognise, in this case an adult and child working together with a laptop, and uses speech and thought bubbles to prompt the child's reflections on the learning. The tool is well-liked by teachers and is established in the research community as eliciting young children's thinking about learning. PVTs were used twice: pre-test and immediately post-test. The main outcomes for the PVT are represented by five measures: information gathering, building understanding and productive thought (representing cognitive skills; Moseley et al. 2005) and metacognitive knowledge and metacognitive skilfulness (representing the metacognitive domain; Veenman et al. 2005). For more information on this process see Appendix 11.

All measures were administered by the schools under guidance from CfL and Durham University teams. This guidance included training days run by CfL, Durham University and the CEM Centre (the latter being the owners and administrators of the InCAS tests). The computer-based and computer-adaptive nature of the InCAS tests helped to ensure that the process for this measure was standardised and effectively blinded (since no pupils received the same test and the marking is automated rather than carried out by the schools). The SDQ and the PVT were sent as email attachments to the schools with clear instructions on how to use them. Members of all the project team were available by email and telephone to handle any questions around administration.

The InCAS data were uploaded by the schools to the CEM Centre, where they were processed. The resulting scores were then passed onto the Durham team to be matched with the pupil record. The SDQ data were sent in paper form to the Durham team. The scores were entered blind by two researchers separately, moderated by a team leader. To check the fidelity of the coding process, the two sets of entered scores were compared against each other and any anomalies checked against the original paper versions. The PVT data were transcribed and the statements coded blind using a deductive coding scheme identifying children's declarative cognitive and metacognitive awareness. This coding process was checked for inter-rater reliability using Cohen's Kappa with an agreement of 84%. In addition, 20% (n=75) of the total sample were double coded by another researcher, and an intra-rater agreement of 98% achieved. Further information can be found in Appendix 11.

[5] http://www.cem.org/incas/introduction
[6] See Appendix 1 for the full questionnaire.

2.5 Sample size

Sample size calculations were carried out by Durham University. The aim of the project was to recruit 50 schools to the study. A minimum detectable effect size (MDES) of 0.42[7] was estimated, based on 25 schools randomised into intervention and control, 30 children per cluster, 0.05 significance level, 0.8 power and a 0.25 intra-cluster correlation. This is a conservative ICC and the calculation does not factor in stratification, which increases the power. The effect size was predicted to be in the range of 0.35 to 0.45 standard deviations.

The actual MDES of Mind the Gap as whole pertaining to the analysis sample for the primary outcome was affected by school dropout and missing data. As reported later, the analysis was based on 22 classes rather than 50, which increased the MDES. On the other hand, the intra-cluster correlation was smaller (0.165) than had been assumed. Furthermore, taking account of the proportion of variation accounted for by regressors and blocking also reduces the MDES. At the pupil level, the adjusted R-squared was 0.70 when including pupil-level regressors, while at the school level the inclusion of blocking variables resulted in an adjusted R-squared of 0.34. The combined effect of these factors was a MDES of 0.45, slightly higher than at the design stage.

2.6 Randomisation

NIESR randomised schools within blocks defined by area and by the proportion of pupils in each school shown in the 2011 school performance tables to achieve Level 4 or higher at Key Stage 2 in both English and maths (low, medium, high – where these thresholds were chosen to achieve equal sized groups in each area). This resulted in 12 blocks (or strata).

Randomisation of **schools** (to achieve a 50:50 allocation) was performed as follows:

- Each school was assigned a randomly generated number
- Schools were sorted by block and, within each block, by the random number
- The first school was randomised
- Each subsequent school was assigned to have the opposite outcome of the previous school.

Randomisation of **classes** (also by NIESR) was performed as follows:

- In intervention schools that had a single Year 4 class, that class was assigned to be eligible for the parental engagement course
- In intervention schools that had two Year 4 classes, one class was randomly assigned as the PETT class and the other as the TT class
- In intervention schools that had three Year 4 classes, a randomly selected class was excluded from the trial and randomisation of eligibility then proceeded as in the two-class case
- In control schools that had a single Year 4 class, that class was selected for the trial
- In control schools, where there were multiple Year 4 classes, the class to be included in the trial was selected at random. The other classes played no further role in the trial and were not requested to provide data.

In practice, there were two factors that disrupted this experimental design. First, some schools dropped out after randomisation. The extent of this is shown in Figure 3. Four schools dropped out before delivery started and the remainder dropped out at some point after the programme started. It is

[7] Note that the EEF Teaching and Learning Toolkit reports a high average effect size for metacognitive approaches (http://educationendowmentfoundation.org.uk/toolkit/meta-cognitive-and-self-regulation-strategies/).

possible, although not inevitable, that this might cause experimental estimates to be biased. Although we cannot say anything about the extent of any such bias, it is equally true that we can no longer rely on the statistical properties of the RCT to argue that the resulting estimates are unbiased.

The second factor concerns assignment of classes. Classes were identified according to who their teacher was intended to be. Randomisation therefore effectively assigned teachers to one of the three arms of the trial (PETT, TT, Control). This has the benefit that teacher effects are randomised along with classes, which prevents schools then allocating teachers according to which class is allocated to which treatment. However, due to teacher turnover, the teacher information that existed at the time of randomisation had, in some cases, changed by the time of implementation. Where this had occurred, it was not always possible to implement the class randomisation as intended.[8] In view of this, we use class status as delivered in practice. This does not adhere perfectly to the randomised treatment status but there is agreement in the majority (78.4%) of cases.

2.7 Analysis

The impact analysis was carried out using multilevel regression models to reflect the clustered nature of randomisation. Apart from the regressors indicating treatment status, models controlled for pupils' age and sex, their EAL, SEN and FSM status, their baseline (pre-test) outcome and the length of time between pre-test and post-test. In addition, block dummies were included in all estimations.

The overall effect of Mind the Gap (comparing PETT to control classes) was estimated following the intent-to-treat principle. However, this was only possible up to a point since schools that dropped out did not provide any outcome information. Unfortunately, as noted above, the practical circumstances surrounding class randomisation meant that it was not possible to follow the intent-to-treat principle when estimating the impact of *components* of Mind the Gap (comparing PETT classes to TT classes to isolate the impact of PE eligibility; or comparing TT to control classes to estimate the impact of TT). Instead, we distinguish PETT classes from TT classes according to whether in practice they were offered the opportunity to participate in the animation course.

Subgroup analysis on the primary outcome for the overall effect of Mind the Gap was carried out for FSM pupils and for pupils with low pre-test scores. This latter definition was operationalised by regarding everyone with a pre-test score in the lowest third of the distribution as having a low pre-test score for the outcome in question. The protocol for the trial identifies some additional intended subgroup analyses. These include: ethnic minority children; children with a low estimated probability of participation in the animation course; subfloor standard schools; and faith schools. However, lack of required information (in the case of the ethnic minority subgroup) and the small size of the achieved sample made such analyses problematic.

2.8 Process evaluation methodology

The process evaluation was completed by the Durham University team and used data from three tools:

- **Participant teacher interviews (n=18):** interviews were completed with teachers whose class had been offered the animation project. These teachers had also received the metacognition training. Interviews were completed at least 3 weeks after the intervention. Interviews focused on teachers' experiences of the intervention and explored issues around home–school relationships, the sustainability of the intervention elements and perceived impacts. The interview schedule is included in Appendices 8 and 9.

[8] In some of these cases it was still straightforward to adhere to the randomisation outcomes. For instance, no real issue arose with one-form entry schools; in two-form entry schools where only one teacher had changed it was reasonable to stick with the randomisation outcome for the known teacher and to apply the alternative status to the unknown teacher.

- **Family interviews (n=16):** interviews with the families who participated in the animation course were carried out 6 months after the intervention. These were semi-structured (see Appendix 10 for interview schedule), but also used as *aides memoires* the family's handbook (which recorded the learning journey through the animation project) and animated film. Interviews focused on each family's experience of the intervention, their relationship with learning, the perceived impacts on family members and the sustainability of these impacts.
- **Video observations (n=3):** three schools – one each from Birmingham, Devon and London – were followed throughout their experience of the animation project. Video data allowed fidelity checks as well as case study exploration of the process experienced by the schools and families. These observations targeted the intervention itself and participants' behaviours within the project experience.

A staged model of analysis was used. In the first phase, data collection was observed and team members discussed initial impressions. Once the data collection was complete, it was viewed and/or read in its entirety for further impressions and interpretations. Multiple researchers completed these stages, allowing the team to discuss, confirm and triangulate emerging ideas. From this, themes with which to structure the analysis stage were identified. In that stage, the data were interrogated in depth to explore key elements within each of the identified themes. This aimed to capture the bigger picture as well as the details typifying each theme.

The design of the project was mixed method, in that both qualitative and quantitative data were collected in a complementary design to answer the research questions. Process data were collected from a subset of schools. These were analysed in their own right but also, along with data such as facilitator diaries and evaluations, could triangulate the outcome measures. The research team undertook an analysis process whereby emerging findings were checked against the outcome measures and the outcome database was interrogated with findings of the process analysis in mind.

3. Impact evaluation

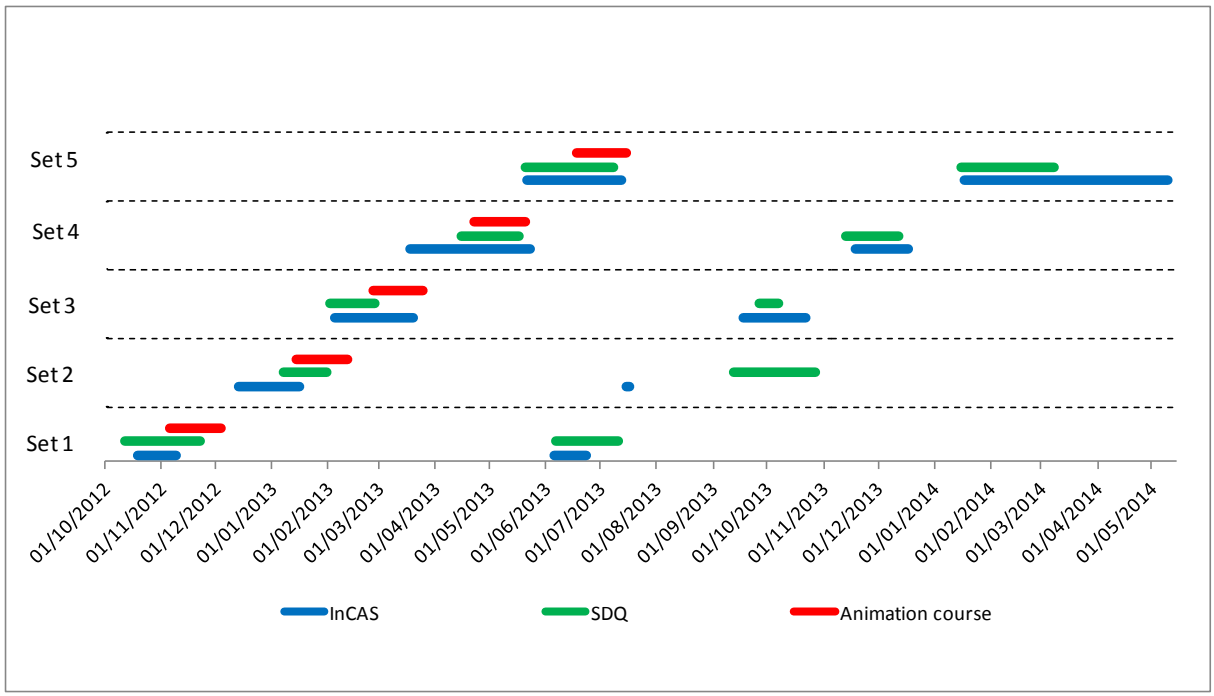
3.1 Timeline

Schools were recruited to the trial between April 2012 and April 2013. School randomisation was staggered; Devon and Haringey schools were randomised in July 2012, Birmingham schools were randomised in November 2012 and Manchester schools were randomised in April 2013.

The teacher training for intervention schools started in September 2012 and finished in October 2013. This consisted of training at the start of the programme in September/October depending on geographical area, then 'on the job' training shadowing the project in their school when it took place. In September/October 2013, a post-course training session took place.

Due to the distribution of the schools across different areas, the animation sessions and the tests took place at different times. The engagement process for the first set of intervention schools to recruit families onto the programme began in September 2012. The implementation timeline is depicted in Figure 2.[9] Schools were divided into five 'sets'. Within each set, there were intervention schools and control schools. The animation course was delivered to participating families at Intervention schools. Pre-tests were carried out at about the same time, although there was some variation across the sets in the extent to which this was achieved. Testing of pupils in intervention and control schools within each set followed a similar schedule.

Figure 2. Implementation timeline



[9] In Figure 2, the dates of the animation course were taken from records kept by the delivery team. The assessment dates (InCAS and SDQ) were recorded in the evaluation database. As such, they are subject to missing values.

Depending on the geographical area, the pre-test was administered between October 2012 and November 2013. Specifically, the InCAS pre-test was administrated between October 2012 and July 2013, while the pre-test for the SDQ was administered between October 2012 and November 2013. The post-test was administrated between June 2013 and June 2014. Again, this varied across areas.

From Figure 2, one might be concerned about pre-tests taking place after pupils had started their animation course. The trial was designed so that pre-tests would be carried out prior to the start of the animation sessions but this was not always possible. Reasons for this were varied and included school staff changes, technological challenges, teacher illness, teacher pregnancy and child illness. In fact, the majority of pre-tests for pupils in PETT classes who also provided 6-month post-test InCAS outcomes (and so featured in the impact analysis for the primary outcome) did take place prior to the start of the animation sessions; the reading, maths and mental arithmetic pre-tests took place after the start of the course in only 16, 11 and 16 cases, respectively. Furthermore, the maximum 'lateness' in any case was only 7 days. This means that they would have only experienced the introductory animation session before being assessed. It seems unlikely that this could have any effect on pre-test scores. For the SDQ outcome, all pupils who were in a PETT class and who also provided 6-month outcomes (and so featured in the impact analysis) had their pre-test before the animation course started, apart from one individual whose pre-test took place two days later.

3.2 Participants

Recruitment

The initial recruitment strategy used to engage schools onto the programme was to target and approach the schools through intermediaries. This included networks of heads and clusters and local authority support services.

In Haringey all schools were selected and invited through the School Standards Service. This proved extremely successful, as all but one of the schools that were approached were recruited to the project. Sixteen schools were approached through this mechanism.

In Devon the project was promoted through the Devon Association of Headteachers. An invitation was issued through their weekly newsletter and schools were asked to contact the project team to express an interest in the project. Twelve of the Devon schools were recruited directly through this route and the additional schools were engaged by the project team, using recommendations and contact information provided by the initial 'self-referral' school cohort.

In Birmingham, the lead of a large school cluster approached the project team, with a 'ready-made' group of schools to join the project. However, take-up was low and, despite direct visits and numerous emails and telephone calls, fewer than eight schools were recruited through this cohort. The project team did additional work in the local area, including promoting the project through an introductory breakfast session for schools and speaking at a local cluster event. Despite this, the team was unsuccessful in recruiting the required number of Birmingham schools. A decision was therefore taken, in conjunction with EEF, to extend the geographical reach of the project to include schools in Manchester. Emails were sent directly or via contacts to 34 Manchester-based schools. Six expressed interest in receiving the programme.

Once schools expressed an interest in the project, the process was similar in each geographical area. A telephone call was made to each school to discuss the programme in more detail. This was followed up by email and, where practical, face-to-face meetings were held with school staff, including senior leaders wherever possible. At this point schools signed a brief document confirming their decision to participate in the project and identifying their two nominated key contacts. The individual project officer assigned to the school then followed this up to introduce themselves and formally welcome the school to the project. There were no events explicitly designed for recruitment purposes, but there were subsequent training events, also attended by the Durham research team who described the evaluation

process at length, answered questions and provided contact details for further queries, building on the information on the evaluation process provided by CfL in their recruitment discussions and meetings.

Numbers in the trial

Figure 3 summarises the number of schools, classes and pupils involved in the trial. Of the 51 schools that agreed to participate, 25 were allocated to the Intervention group and 26 to the Control group. Of the 25 Intervention schools, 11 were one-form entry, while 14 were of two- or three-form entry.[10] All classes in one-form entry schools were designated PETT classes. In the two- and three-form entry schools, one class was randomly selected as the PETT class and one as the TT class. This means that the overall effect of Mind the Gap can be estimated using data from all schools (there will be a PETT class in all intervention schools) while the effect of TT alone and the effect of PE alone can only be estimated in larger schools (i,e. not one-form entry schools). This is dealt with in the analysis by restricting the sample to two- and three-form entry schools when estimating the latter two impacts. However, as noted already, there was non-compliance with the randomised treatment at the class level (there was no non-compliance at the school level) and, in cases where teachers had changed, it was not even possible to impose the randomised outcomes. Figure 3 does not therefore identify the class allocation as random. Instead, it reports the de facto treatment status: 25 PETT classes and 14 TT classes.

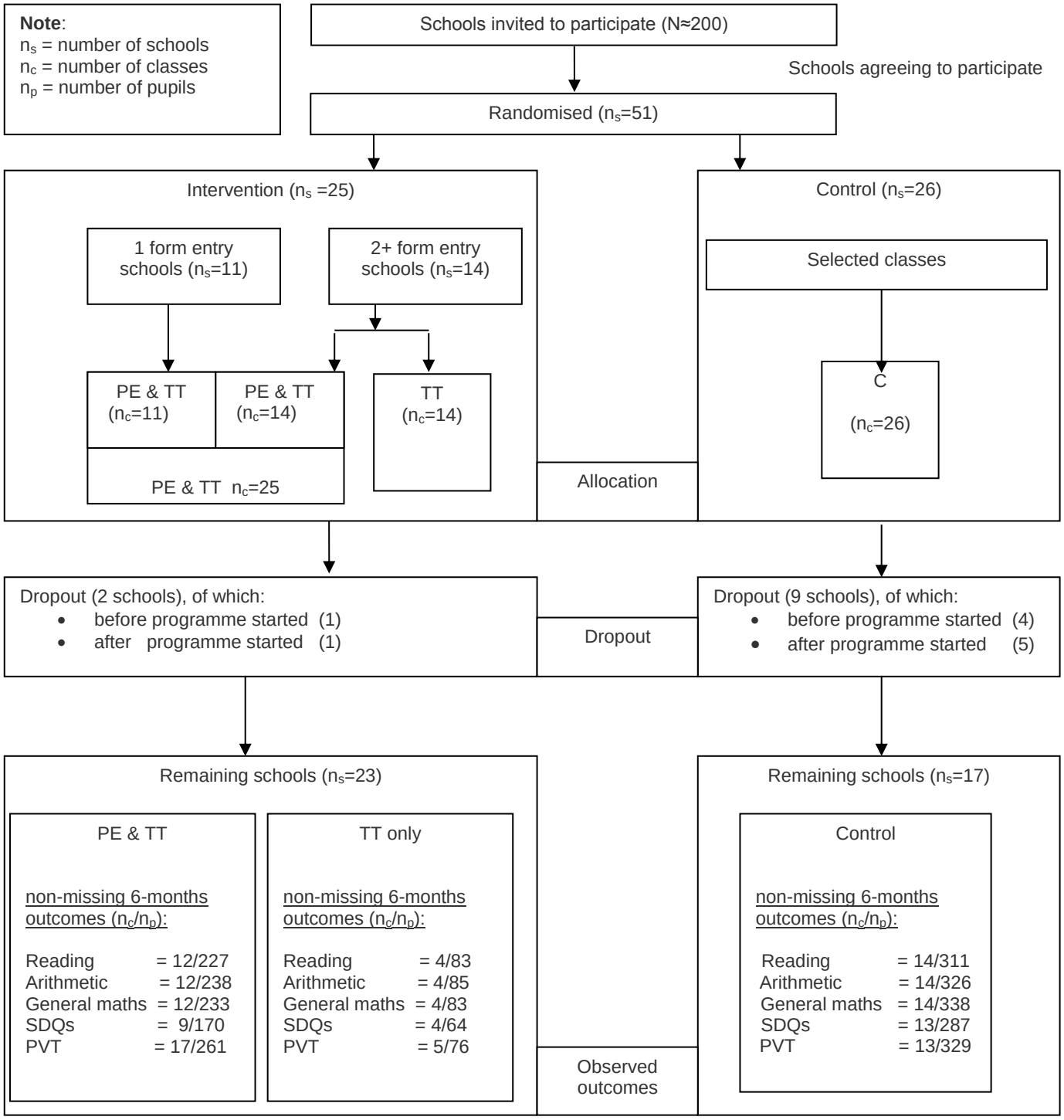
School dropout was a problem. Of the Intervention schools, two dropped out, one before and one after the start of the programme. The reasons given to the CfL team for dropping out were changes in staffing (resulting in a feeling that the school could no longer commit to the project) or a prior lack of awareness of the amount of work the tests would involve. Numerous attempts were made to retain schools – offering additional support, reminding them of their commitment, offering to discuss ways of helping – but these were not successful. Of the control schools, four dropped out before the programme had started and five dropped out later. This left 23 and 17 schools involved in the intervention and control groups, respectively.

There were a number of additional deviations from the design. Two control schools provided data for two classes rather than one. This resulted in there being 19 classes for 17 schools. In one intervention school both classes received the animation session, resulting in there being one additional PETT class and one less TT class. Additionally, four intervention schools provided outcomes for the PETT class but none for the TT class. This contributed to the unbalanced number of observations between the PETT and the TT classes – 635 and 377 pupils, respectively – compared to 543 in control classes.

The impact estimates were based on fewer observations still due to missing post-tests. Figure 3 provides details (in the bottom boxes) of the number of observations available for each outcome. Some missing data occurred arose for pupil-specific reasons (such as absence due to illness) and may be felt to be unrelated to treatment and outcomes. More problematic was the case of whole classes missing outcome data. Such cases have a more negative effect on the power of the trial and may also introduce bias if there is a systematic relationship with treatment status and outcomes. The bottom boxes in Figure 3 show, for each outcome, two numbers. The first is the number of classes for which the (6-month) outcome in question is observed for at least one pupil. The second is the number of pupils, across all classes, for which the outcome is observed.

[10] While the intention had been not to include two-form entry schools in the trial, recruitment difficulties meant that, to achieve the required number of schools, some one-form entry schools were admitted.

Figure 3. Flowchart of sampling, allocation and attrition



Parental/pupil engagement

In addition to working with schools, the intervention relied on buy-in from parents. An engagement process lasting approximately 12 weeks was used to recruit families onto the course (there was some slight variation in timescales due to term dates). The first stage was a letter sent home to all families within the target class (average of 29 per class, i.e. approximately 1305 families in total). This was followed approximately six weeks prior to the start of the course by a class taster session working with the entire target class. This involved explaining more about the project, a short animation group-work task and the completion of 'Wanted Posters' – personal invitations from the children to their parents to attend the course. These were accompanied by a second letter home. Four weeks prior to the start of the course, parents were invited to come to a parent and child taster session, to find out more about the project and complete a short animation task. Three weeks prior, class teachers were encouraged to speak to parents on the playground to increase engagement. Reminder letters were sent in each of the two weeks prior to the course start date, reminding families about the project. In some schools this was supplemented by text messages home to families.

Table 1a summarises the number of animation sessions attended by pupils in the PETT classes. About 72% of pupils (458) did not attend any animation session. Of the 177 pupils who attended at least one session, 58% of pupils (102) attended all five. This is lower attendance than had been hoped for and expected. Reasons for this low take-up included issues around the timetabling of the animation sessions to fit with parents' work patterns and children's after-school activity and a lack of prioritisation, commitment and support from some schools at the point of recruitment. The animation sessions targeted fathers and male carers because they are known to be more difficult to engage in school activities (for example, see Desforges and Abouchaar 2003) which are frequently identified with the role of the female carer or mother.[11] However, where male carers and parents were not available, there was an option for a female parent or carer to take part, so as to be inclusive. While targeting male adults may have played a part in lower attendance than hoped for, it was at times overcome through flexibility towards gender inclusion, depending on how the project was communicated to and understood by the audience. Mostly, however, the nature of the targeted schools serving communities with a variety of challenges means that parental engagement activities in schools will often be viewed with some suspicion. In the process outcomes we discuss more extensively how recruitment could be improved.

Table 1a. Number of animation sessions attended in PETT classes

Number of sessions attended	Frequency	Percent
0	458	72.13
1	13	2.05
2	15	2.36
3	14	2.2
4	33	5.2
5	102	16.06
Total	635	100

[11] In 2010-11, 87.7% of those attending family learning were female (see page 39 of **http://shop.niace.org.uk/media/catalog/product/n/i/niace_family_learning_report_reprint_final.pdf**).

Additional insight is possible by examining the factors associated with participation among those eligible for the animation sessions. The results of estimating a probit model of participation are presented in the first column of Table 1b. The variables included in the model were selected by stepwise reduction, beginning with the range of school and pupil background characteristics considered in the impact estimates discussed later. To make the coefficients more interpretable, the 'Prob. low' column gives, for continuous variables, the probability of participation at the 25th percentile of the variable in question, the 'Prob. high' column does similarly for the 75th percentile and the final column reports the change in the probability of participation associated with a move across the inter-quartile range. The exception to this format is the third variable ('Missing reading age at baseline') since it takes values zero and one; accordingly the 'Prob. low' column shows the estimated probability when zero, the 'Prob. high' column shows the estimated probability when one and the final column shows the change in probability when moving from zero to one.

Three points are apparent from Table 1b. The first is that the single personal characteristic (mental arithmetic at baseline), while statistically significant, does not have a dramatic effect on participation.[12] Not having data on reading level at baseline has a bigger effect. This is obviously hard to interpret but it is relevant to point out that missing data could arise for reasons associated with the pupil or with the class/school. It is conceivable, for instance, that schools less committed to the research may be less likely to provide baseline assessments and also less likely to promote the intervention. In this vein, the second point is that school characteristics appear to be more important than pupil characteristics, in the sense that the differences shown in the final column are much larger for the last two variables than for the first two. Third, participation is higher when the SEN percentage in the school is higher, and lower when the FSM percentage is higher. This last effect appears particularly strong and suggests that promoting parental engagement is especially challenging in schools serving poorer areas. It is interesting to note that pupils' individual FSM status was not found to be statistically significant.

[12] The term 'effect' is used loosely; clearly, these are only associations rather than necessarily causal relationships.

Table 1b. Factors associated with participation in the animation course: results of estimating a probit model

	Coeff.	Prob low	Prob High	Prob diff
Mental arithmetic age at baseline	0.003*	0.301	0.324	0.023
	[0.001]	[0.021]	[0.028]	
Missing reading age at baseline	0.432**	0.237	0.368	0.131
	[0.152]	[0.020]	[0.037]	
School SEN percentage	0.097**	0.228	0.370	0.142
	[0.020]	[0.017]	[0.025]	
School FSM percentage	-0.030**	0.422	0.171	-0.251
	[0.004]	[0.028]	[0.017]	
Constant	-0.940**			
	[0.247]			
N	635			

* p<0.05, ** p<0.01.

3.3 School and pupil characteristics

Tables 2a to 2c present the characteristics of the 51 schools included in the trial. Table 2a shows that the geographical distribution of the schools was balanced across the intervention and control groups. The Fisher's test shows no statistically significant differences across intervention and control schools.

Table 2a. Geographical distribution of schools

	Intervention		Control	
Geographical distribution	Frequency	Percentage	Frequency	Percentage
Devon	8	32.0	8	30.8
London	8	32.0	8	30.8
Birmingham	7	28.0	8	30.8
Manchester	2	8.0	2	7.7
Total	**25**	**100**	**26**	**100**

Fisher's test P-value = 1.000

Table 2b shows the mean characteristics of the schools recruited for the trial. Again, the intervention and control schools look similar. The average number of pupils in the intervention schools is 286, slightly higher in the control schools (320) but not significantly so. In both intervention and control schools, about 10% of pupils are under the Special Education Need statement or School Action Plus (SEN) and for about one third of pupils English is not the first language (EAL). About 35% of pupils are eligible for free school meals (FSM) and about 70% achieved Level 4 or higher in reading, writing and maths.

Table 2b. Characteristics of pupils in recruited schools

	Intervention	Control	Difference
	N=25	**N=26**	**N=51**
Number of pupils	286	320.0	-33.96
	(138.8)	(108.3)	[34.787]
Percentage of pupils with SEN statement or on School Action Plus	10.18	9.735	0.44
	(3.863)	(4.563)	[1.186]
Percentage of pupils with English not as first language	31.35	36.18	-4.84
	(28.53)	(30.77)	[8.319]
Percentage of pupils eligible for free school meals	34.84	34.76	0.07
	(18.37)	(15.92)	[4.807]
Percentage achieving Level 4 or above in reading, writing and maths	69.24	70.96	-1.72
	(17.38)	(11.41)	[4.101]
Ofsted rating	2.16	2.31	-0.148
	(0.624)	(0.736)	[0.191]

Notes: Based on School Performance Table 2012, Department of Education. Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

Table 2c presents the number of PETT, TT and control classes. The smaller number of TT classes arises from the fact, already discussed, that classes in one-form entry schools were always assigned to the PETT group.

Table 2c. Distribution of classes by schools

	Intervention	Control
Parental Engagement and Teacher Training Classes (PETT)	25	
Teacher Training Classes (TT)	14	
Control Classes, of which:		26
1-entry form		7
2- or 3-form entry form		19
Total	**40**	**26**

Baseline pupil characteristics are presented in Tables 3a to 3c. The first three columns of Table 3a (under the overarching heading 'Randomised sample') are based on all pupils. These show that, in PETT and control classes, female pupils represent about 48% of all pupils. The mean age of pupils is eight and a half years. The percentage of EAL, SEN and FSM pupils in control schools are 29%, 25% and 29%, respectively. In PETT classes, the corresponding proportions are slightly lower but the differences are never statistically significant. The next three columns (under 'Analysis sample') produce analogous results for the subsample of pupils who are included in the eventual analysis for the primary outcome. This is a smaller sample and there is evidence of some mismatch between the PETT and control classes; those in PETT classes are slightly older (in the analysis sample, at least) and considerably less likely to have English as an additional language. The primary outcome itself – literacy and numeracy – does not differ significantly across the two groups at baseline.

Table 3b follows a similar format. However, since classes within one-form entry intervention schools are all PETT, TT classes can only exist in schools that are two- or three-form entry. Consequently, Table 3b excludes one-form entry control schools in order to avoid reflecting systematic differences between larger and smaller schools. Considering the 'Randomised sample' first, there is a significantly higher FSM proportion among the TT classes but the other characteristics appear balanced. For the 'Analysis sample', those in TT classes are slightly older than those in control classes but, otherwise, there are no significant differences.

Table 3a. Baseline pupil-level characteristics, PETT and control classes

	Randomised sample			Analysis sample		
	PETT	**C**	**PETT-C**	**PETT**	**C**	**PETT-C**
N schools	23	17		10	12	
Female	0.479	0.476	0.003	0. 493	0.481	0.012
	(0.500)	(0.500)	[0.029]	(0.500)	(0.501)	[0. 046]
N	635	542	1,177	209	283	492
Age	8.437	8.472	-0.035	8.505	8.456	0.049
	(0.399)	(0.327)	[0.022]	(0. 297)	(0.367)	[0.031]*
N	528	527	1,055	209	283	492
EAL	0.243	0.292	-0.049	0. 122	0.224	-0.102
	(0.429)	(0.455)	[0.028]	(0. 328)	(0.418)	[0.034]**
N	556	473	1,029	180	250	430
SEN	0.214	0.252	-0.038	0.206	0.268	-0. 062
	(0.411)	(0.434)	[0.026]	(0.405)	(0.444)	[0.042]
N	556	473	1,029	180	250	430
FSM	0.268	0.288	-0.02	0.272	0.296	-0. 024
	(0.443)	(0.453)	[0.028]	(0.446)	(0.457)	[0.044]
N	556	473	1,029	180	250	430
Literacy & numeracy	105.3	106.9	-1.584	108.32	107.17	1.141
	(17.362)	(17.70)	[1.257]	(18.575)	(18.111)	[1.964]
N	360	425	785	139	230	369

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

Table 3b. Baseline pupil-level characteristics, TT and control classes in two- and three-form entry schools

	Randomised sample			Analysis sample		
	TT	**C**	**TT-C**	**PETT**	**C**	**PETT-C**
N schools	10	11		4	8	
Female	0.457	0.469	-0.012	0.443	0.471	-0.028
	(0.499)	(0.500)	[0.040]	(0.500)	(0.500)	[0.069]
N	267	369	636	70	208	278
Age	8.433	8.445	-0.012	8.535	8.432	0.103
	(0.391)	(0.344)	[0.033]	(0.293)	(0.384)	[0.050]*
N	184	354	538	70	208	278
EAL	0.245	0.255	-0.01	0.205	0.229	-0.025
	(0.431)	(0.437)	[0.043]	(0.408)	(0.421)	[0.070]
N	147	337	484	44	179	223
SEN	0.211	0.273	-0.062	0.341	0.296	0.045
	(0.409)	(0.446)	[0.043]	(0.479)	(0.458)	[0.078]
N	147	337	484	44	179	223
FSM	0.354	0.252	0.102	0.318	0.257	0.061
	(0.480)	(0.435)	[0.044]*	(0.471)	(0.438)	[0.075]
N	147	337	484	44	179	223
Literacy & numeracy	106.44	105.72	0.726	113.346	108.286	5.059
	(19.412)	(18.691)	[2.043]	(18.004)	(18.421)	[2.903]
	126	269	395	53	160	213

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

Table 3c compares the characteristics of pupils in the PETT and the TT classes in two- and three-form entry intervention schools. Here, the only statistically significant difference is that those in PETT classes have slightly lower attainment at baseline than those in TT classes (in the analysis sample).

Table 3c. Baseline pupil-level characteristics, PETT and TT classes in two- and three-form entry Intervention schools

	Randomised sample			Analysis sample		
	PETT	**TT**	**PETT-TT**	**PETT**	**TT**	**PETT-TT**
N schools	14	10		6	4	
Female	0.470	0.457	0.014	0.431	0.443	-0.012
	(0.500)	(0.499)	[0.039]	(0.497)	(0.500)	[0.075]
N	406	267	673	116	70	186
Age	8.454	8.433	0.021	8.537	8.535	0.002
	(0.386)	(0.391)	[0.036]	(0.286)	(0.293)	[0.044]
N	313	184	497	116	70	186
EAL	0.300	0.245	0.055	0.152	0.205	-0.052
	(0.459)	(0.431)	[0.044]	(0.361)	(0.408)	[0.069]
N	367	147	514	92	44	136
SEN	0.223	0.211	0.013	0.283	0.341	-0.058
	(0.417)	(0.409)	[0.040]	(0.453)	(0.479)	[0.085]
N	367	147	514	92	44	136
FSM	0.278	0.354	-0.076	0.348	0.318	0.03
	(0.449)	(0.480)	[0.045]	(0.479)	(0.471)	[0.087]
N	367	147	514	92	44	136
Literacy & numeracy	104.39	106.44	-2.053	105.67	113.35	-7.679
	(17.538)	(19.412)	[2.048]	(18.919)	(18.004)	[3.212]*
N	215	126	341	91	53	144

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05; ** p<0.01.

Tables 4a and 4b report baseline levels of the secondary outcome variables for those individuals where the corresponding post-test outcome is non-missing. Table 4a considers the InCAS scores for reading, maths and mental arithmetic and the Likert score for the SDQ. Apart from mental arithmetic, all other outcomes show some significant differences in at least one of the comparisons. Similarly, Table 4b shows significant differences for three of the five PVT outcomes.

Table 4a. Pre-tests for InCAS and SDQ outcomes

	1-, 2- or 3-form entry schools			2- or 3-form entry schools				
	PETT	C	PETT-C	PETT	TT	C	TT-C	PETT-TT
Reading	108.1	107.4	0.6	104.5	113.7	107.4	6.3*	-9.1**
	(22.7)	(21.6)	[2.2]	(23.0)	(21.5)	(22.1)	[3.0]	[3.5]
N schools	9	12		5	4	8		
N pupils	157	285		102	69	207		
Maths	109.3	106.2	3.2*	107.1	110.3	106.0	4.3	-3.2
	(15.8)	(15.7)	[1.5]	(16.4)	(17.0)	(15.8)	[2.2]	[2.5]
N schools	9	12		5	4	8		
N pupils	184	326		114	68	230		
Mental arithmetic	106.4	105.2	1.2	103.1	106.5	106.6	-0.1	-3.5
	(20.1)	(21.4)	[2.0]	(21.8)	(19.9)	(21.2)	[2.9]	[3.2]
N schools	9	11		5	4	7		
N pupils	173	277		108	72	188		
SDQ	19.1	20.2	-1.1	19.1	21.0	20.3	0.7	-1.9
	(4.3)	(3.8)	[0.4]	(4.6)	(5.0)	(3.6)	[0.8]	[1.0]
N schools	7	9		5	2	7		
N pupils	147	237		105	25	192		

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

Table 4b. Pre-tests for PVT outcomes

	1-, 2- or 3-form entry schools			2- or 3-form entry schools				
	PETT	C	PETT-C	PETT	TT	C	TT-C	PETT-TT
Building understanding	8.0	12.9	-4.9**	8.8	12.0	13.4	-1.4	-3.2*
	(9.1)	(13.2)	[1.0]	(9.3)	(12.5)	(13.3)	[1.9]	[1.6]
N schools	14	11		11	5	9		
N pupils	215	287		137	62	243		
Information gathering	13.9	14.3	-0.4	12.9	11.8	13.2	-1.3	1.1
	(8.4)	(11.4)	[0.9]	(8.2)	(9.8)	(10.7)	[1.5]	[1.3]
N schools	14	11		11	5	9		
N pupils	215	287		137	62	243		
Productive thinking	4.1	6.5	-2.4*	4.7	7.5	7.3	0.2	-2.8
	(8.3)	(12.3)	[1.0]	(9.0)	(10.4)	(13.1)	[1.8]	[1.4]
N schools	14	11		11	5	9		
N pupils	215	287		137	62	243		
Metacognitive knowledge	1.1	3.2	-2.1**	1.5	2.6	3.7	-1.1	-1.1
	(3.4)	(9.5)	[0.7]	(4.0)	(5.5)	(10.2)	[1.3]	[0.7]
N schools	14	11		11	5	9		
N pupils	215	287		137	62	243		
Metacognitive skilfulness	1.3	2.3	-1.0	1.6	1.4	2.6	-1.3	0.3
	(4.5)	(6.8)	[0.5]	(5.2)	(5.4)	(7.2)	[1.0]	[0.8]
N schools	14	11		11	5	9		
n pupils	215	287		137	62	243		

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

The baseline imbalances seen in Tables 3a to 4b raise concerns about the extent to which it is reasonable to view the trial as able to deliver unbiased impact estimates. However, it is important to note that the baseline data are themselves imperfectly recorded. In particular, there is a high incidence of missing values. Table 5 shows the proportion of missing baseline outcomes (or pre-tests) when the post-test outcome is not missing. The fact that there is considerable variation across the arms of the trial means that the imbalances discussed above may reflect both true imbalance and imbalance in

availability of data. Overall, the imbalances raise a concern about the reliablility of the impact estimates but are not in themselves sufficient to conclude that the resulting impacts will be biased.

Table 5. Missing pre-tests

	1-, 2- or 3-form entry schools		2- or 3-form entry schools		
	PETT	C	PETT	TT	C
Reading & maths	0.33	0.19	0.22	0.24	0.23
Reading	0.31	0.08	0.23	0.17	0.09
Maths	0.21	0.04	0.16	0.18	0.04
Mental arithmetic	0.27	0.15	0.23	0.15	0.20
SDQ	0.23	0.27	0.30	0.63	0.23
PVT	0.18	0.13	0.06	0.18	0.13

Notes: Standard deviation in (.). Standard error in [.]. Significance of the differences is on the basis of t-tests; * p<0.05, ** p<0.01.

3.4 Outcomes and analysis

The main results are presented in Tables 6a to 6c. For each outcome, there are three estimated effects:

- The overall effect of Mind the Gap (denoted PETT)
- The effect of teacher training alone (denoted TT)
- The effect of eligibility for the Parental Engagement animation course (denoted PE) for those in schools where teachers received the training.

Table 6a presents impacts on the primary outcome as effect sizes. These are calculated by dividing the estimated impact coefficients by the level 1 standard deviation from the respective multilevel regression, and so control for covariates and the school-level random effect. The estimation results are shown in detail in Appendices 12 and 13. These detailed results reveal that one of the maths regressions and two of the SDQ regressions suggest no random effect. As a robustness test, linear regressions were also estimated, clustering standard errors. These gave results that were essentially identical to the multilevel results.

Table 6a suggests no significant effect on literacy and numeracy of Mind the Gap as a whole, nor any significant effect of its individual elements. This is also true for the FSM and low pre-test subgroups. Similarly for attainment (reading, maths, mental arithmetic) and SDQ secondary outcomes, Table 6b finds no statistically significant impacts. Table 6c presents the PVT outcomes. For three of the outcomes – building understanding, information gathering and metacognitive knowledge – there is no significant effect. However, significant impacts on productive thinking and metacognitive skilfulness are evident. In both cases, Mind the Gap as a whole is not found to have a statistically significant impact, nor is there a separate statistically significant effect of the teacher training component. But eligibility for the animation course acts to increase metacognition as measured by these outcomes.

Table 6a. Estimation results: literacy and numeracy

Outcome	Effect type	Effect size	Standard error	P-value	95% confidence interval	N Schools	N Pupils
Full sample	PETT	-0.141	0.283	0.618	[-0.697, 0.414]	22	492
	TT	0.009	0.575	0.988	[-1.119, 1.137]	12	278
	PE	-0.252	0.165	0.126	[-0.576, 0.071]	6	186
Subgroups:							
FSM subgroup	PETT	-0.265	0.544	0.626	[-1.332, 0.801]	17	123
Low pre-test	PETT	0.129	0.449	0.775	[-0.752, 1.010]	18	110

Table 6b. Estimation results: reading, maths, mental arithmetic, SDQ

Outcome	Effect type	Effect size	Standard error	P-value	95% confidence interval	N Schools	N Pupils
Reading	PETT	-0.069	0.249	0.782	[-0.558, 0.420]	23	538
	TT	0.167	0.527	0.752	[-0.866, 1.200]	12	310
	PE	-0.281	0.160	0.078	[-0.593, 0.032]	6	215
Maths	PETT	-0.167	0.219	0.445	[-0.596, 0.262]	23	571
	TT	-0.253	0.422	0.549	[-1.079, 0.574]	12	322
	PE	-0.043	0.152	0.777	[-0.341, 0.255]	6	219
Mental arithmetic	PETT	-0.207	0.201	0.305	[-0.601, 0.188]	23	564
	TT	-0.161	0.409	0.694	[-0.963, 0.642]	12	321
	PE	-0.053	0.155	0.734	[-0.358, 0.252]	6	225
SDQ	PETT	-0.005	0.194	0.979	[-0.386, 0.376]	19	516
	TT	0.206	0.212	0.332	[-0.210, 0.622]	12	318
	PE	0.067	0.175	0.700	[-0.276, 0.411]	6	217

Table 6c. Estimation results: PVT outcomes[13]

Outcome	Effect type	Effect size	Standard error	P-value	95% confidence interval	N Schools	N Pupils
Building understanding	PETT	-0.155	0.249	0.533	[-0.642, 0.332]	28	590
	TT	0.180	0.329	0.584	[-0.464, 0.824]	15	354
	PE	-0.129	0.190	0.495	[-0.501, 0.242]	12	222
Information gathering	PETT	-0.109	0.223	0.625	[-0.546, 0.328]	28	590
	TT	-0.300	0.252	0.233	[-0.793, 0.193]	15	354
	PE	-0.115	0.187	0.538	[-0.482, 0.252]	12	222
Productive thinking	PETT	0.264	0.216	0.220	[-0.158, 0.687]	28	590
	TT	0.233	0.214	0.276	[-0.186, 0.652]	15	354
	PE	0.503	0.193	0.009	[0.126, 0.881]	12	222
Metacognitive knowledge	PETT	0.113	0.171	0.510	[-0.223, 0.448]	28	590
	TT	0.216	0.218	0.323	[-0.212, 0.644]	15	354
	PE	-0.046	0.187	0.806	[-0.413, 0.321]	12	222
Metacognitive skilfulness	PETT	0.146	0.184	0.427	[-0.214, 0.505]	28	590
	TT	-0.013	0.166	0.939	[-0.338, 0.313]	15	354
	PE	0.583	0.192	0.002	[0.207, 0.960]	12	222

Cost

Animation course

The pupil-level intervention would cost in the region of £1,950 (depending on whether software was purchased or free software accessed and on the location). This includes recruitment and delivery for

[13] These outcomes are based on counts of specified words. As such, they include a high proportion of pupils scoring zero and, at the other extreme, a small number of pupils with very high scores. To assess the robustness of the findings to the highly non-normal distribution of outcomes, a mixed Poisson model was estimated. This too found significant effects on productive thinking and metacognitive skilfulness. To assess robustness to the high-scoring outliers, a separate analysis 'Winsorised' the pre-test and post-tests, topcoding at the 95th percentile of the respective distribution. Again, the significant results held.

up to 15 pupils and families. An alternative option is to buy in a Train the Trainer course to receive training and the resources to deliver the intervention themselves at a cost of £800 plus equipment, courier fees and facilitator transport costs. Additional resources can be accessed electronically free of charge or in hard copy at low cost. For example, the printed Family Handbooks cost £4-£5 per family. Prices quoted are exclusive of VAT.

Computers and webcams or tablets with in-built cameras are needed with animation software or apps installed. There are free and paid-for versions available. Schools also need materials to create models to animate, for example, plasticine, lego, craft items. Junk modelling materials can be used to promote creativity and ensure value for money.

Schools wanting to deliver the intervention themselves will need to familiarise themselves with the programme through a one-day training course. Session plans are available but there will be some planning time for adapting these for any specific needs of learners, arranging logistics of running the course and engaging families, approximately 12 hours per course. If 'buying in' CfL to deliver the programme, schools should still allow approximately 5 hours of staff time to make arrangements with the facilitators, distribute letters and evaluate the programme.

Schools contributed varying amounts of staff time to the programme, and incurred some limited supply costs to release teaching staff to attend training. There was no capital expenditure required, although some schools incurred small costs as they provided refreshments and additional craft resources.

Teacher training

The teacher training component of the course was typically £195 per delegate. On a per child basis, this translated to a small additional cost, in the region of £7.

4. Process evaluation

4.1 Implementation

What are the necessary conditions for success of the intervention?

Many of the conditions for success apply to the set-up of the project, in particular communication of the commitments involved and the expectations that participation requires. Set-up meetings with schools require a clear introduction to the rationale and objectives for the project. It is important that schools do not see the animation project in isolation but rather see it as complementary to other school agendas, especially parental engagement and learning-focused pedagogy, where the association between the staff development training and the animation project is crucial.

The partnership between stakeholders, the school, families and facilitator/CfL, should be grounded in clear communication and shared goals. Identifying appropriate fit between the different agendas, particularly the schools, will be supportive of this.

A named representative, preferably the teacher of the class participating in the animation project, should lead school involvement and they should be inducted into and understand fully the interwoven nature of the animation and metacognition elements. They should commit to attend and help out at all sessions of the animation project. In this way they are a visible presence to the families taking part, they can support the facilitator where necessary, and they can take the opportunity to observe the families and the way the child they know is embedded in the family unit.

Family recruitment is an important stage. School commitment and therefore communication of the project to families is essential at this point. The animation project works better if enough families attend. We suggest that at least six families are needed to ensure a productive learning environment.

Low attendance can be explained by a number of reasons as opposed to a single major cause:

- Engaging parents in school is notoriously difficult in many schools. It is especially difficult when the schools targeted are in ‘hard to reach’ areas of socio-economic deprivation, where ‘school’ does not have positive connotations for many adults who did not themselves thrive there as children. This challenge is compounded by an initial emphasis on targeting male parents and carers as the preferred audience.
- It proved to be impossible to time the sessions perfectly to suit all parents, who had different working patterns and commitments.
- To some degree, engagement was more likely in schools where there was an existing, solid partnership with parents. However, part of the value of the project was in working with schools which had identified the need to develop this – as such, these schools may have done a little less to get parents on board and the barriers which needed to be broken down to permit engagement were more substantial.

Further factors which impact on success include the following:

- There is a tension between the ‘animation’ and ‘metacognition’ aspects of the project, which occasionally can cause a conflict of expectations.
- There is a ‘catch 22’ situation where, until families experience the metacognition aspects of the project, it is difficult to understand its place in an animation project. This means that the metacognition elements can sometimes cause puzzlement; however, this tension is balanced by the positive impacts overall and families come to understand the value of the pedagogy. Sensitive and confident facilitators are able to support families through this process.

These findings have arisen from family and teacher interviews and researcher observations of project sessions across schools.

Are there any barriers to delivery?

- Barriers to delivery tended to be related to logistics, some of which concerned ICT; for project delivery, these included a lack of ICT equipment (for example, laptops and webcams not being delivered to venues by couriers on time, or equipment not working).
- Problems were also experienced with ICT support for the InCAS tests (for example, issues with uploading the software to the school server).
- Inevitable staff turnover in schools meant that on occasion named staff who were responsible for project elements left and, if handover was not strategically managed, then the project could slip off the school's radar.
- The nature of the project involved complex partnership working between the school, family and facilitator (from CfL). Good, clear communication was essential at all stages of the project, and particularly around the project set-up and recruitment of families. Miscommunications at this stage or a perceived lack of commitment by one partner could jeopardise the project.

Is the intervention attractive to stakeholders?

The majority of participants, families and school staff, were positive about the intervention, indicating that it helped them to:

- Enhance relationships between home and school
- Enrich perspectives on learning lifelong and life-wide
- Engage children and adults in learning and nurturing that relationship
- Combine agendas the school was already pursuing, e.g. skills-based curriculum, metacognition, enquiry
- Develop creative projects – does some of this job for the school and is attractive to participants
- Develop IT projects – does some of this job for the school and is attractive to participants
- Enhance the school's 'out of school' offer
- Support story-telling with direct translation to literacy

4.2 Outcomes

The discussion below encompasses both elements of the intervention, the teacher training and the animation project. The families were participants in the animation project and so this was their main focus. The teachers were from schools that had received both the teacher training and the animation project and so were able to talk about both elements. However, in that they were inter-related and designed to complement one another, it is not possible to separate out responses relating to the different elements.

Positive impact on family relationships

All the schools engaged in the project were keen to develop home–school connections. Teachers were keen to comment on the insight provided into the working relationships of families: the cooperative approaches and the way in which the child or parent took a lead (with the latter being the most negatively viewed). There were many examples from teachers observing development in the relationships.

Families, on the other hand, often said that their relationships had not changed but frequently talked about the positive impacts in a less direct way, discussing the development of teamwork and better understanding of how their children learn, both of which suggest increased closeness between parent and child. They could identify that the practical challenges inherent in the animation project made it necessary for them as a partnership to find ways to work together, to negotiate ideas and to perform

physical tasks effectively. Adults often talked about seeing the project as a rare opportunity to work intensively with one child and the way this had benefits for their relationship. Many families talked about increased engagement with children afterwards, in helping with homework, in creative activities and occasionally with animation.

The teachers saw the development of relationships between parents and school as very important outcomes of the project. They noted increased engagement or communication with the less prominent parent (often male), giving examples of parents supporting more at school, or communicating with school better. From the families' perspective, the parents often valued the opportunity to gain an insight into their child's school and classroom context, valuing this added closeness.

An additional area of development the teachers observed was in their relationship with the child. For example, one teacher discussed how watching the children work helped her in the classroom. She used examples from practice and talked about how it helped her refine her teaching in response to seeing the children learning with their parents.

The animation project as a vehicle for family learning

Across the interviews, the animation was seen as a good motivator and some teachers specifically commented on how it was especially so for fathers. The teachers were very positive about how the project was structured and the way in which it was challenging enough to allow participants to see that learning did not always go smoothly. They could see real value in this for the children and the parents. A few schools talked about how they have continued to use the animation project in school to engage parents in learning with their child.

The families also reflected on how the technical and creative challenges inherent in the process presented good learning opportunities. Families usually came to understand the value of the animation process for supporting the development of metacognition. However, families sometimes saw a disconnect between the two elements.

A focus on learning

Many families talked positively about coming 'back to school', the altered learning environment that the project enabled and how the intensity of the project provided a window into the detail of the child's learning. 'Creativity' and 'teamwork' were frequently referred to in terms of learning skills which the project helped nurture. Some families noticed increases in children's confidence as a result of the project. The small size and relatively informal nature of the social setting were discussed as factors that facilitated this, along with the pride children had in their finished work.

The majority of schools in which the project worked well had used similar techniques before; it had a good fit with skills-based and inquiry-based learning in schools. As a group, the teachers were keen to mention metacognitive development and resilience as two key concepts embedded in the project. They also commonly talked about impacts on pupils' self-esteem and confidence.

Sustainability: impact home, impact school

Many of the schools and teachers were transferring the ideas from the teacher training element into the classroom. They were also trying out ideas from the animation element of the intervention, for example the learning language and use of exemplification in prompts such as 'remember when...'. Teachers believed that the project had resulted in the involvement of participant families in school activities, especially family members who had previously been less visible. This was echoed by the parents who felt that they had had the opportunity to open a window on school activities and the learning activities in which their child was involved. They felt better able to talk about learning and teaching with the school and their child's teacher.

Negative aspects

The teachers were negative about the standardised approach of the research project design. They felt that lack of flexibility meant that the project was insufficiently inclusive and that fewer families were recruited than would be the case with a more flexible model. The inflexible aspects of the project were requirements of the RCT design and were unavoidable in order to evaluate the project.

In addition, the RCT arrangements, the waiting list control, the attainment tests and other outcome measures were all seen as an added burden on precious learning and teaching time. Some teachers even documented that they felt 'hounded' by the RCT aspect of the project.

Families had a limited recall of the metacognition aspects of the project, in comparison to the project content. This does not mean that learning did not happen: some elements of it were recognised but many appear to have been forgotten. For example, there was little mention of the '5Rs' (Readiness, Resourcefulness, Resilience, Responsibility and Reflectiveness), whether directly or indirectly, to describe what took place. 'Creativity', 'teamwork' and 'confidence' were the main areas of learning discussed, along with ideas around challenge and not giving up. This may also reflect families' limited ability to verbalise this thinking rather than the absence of this process. In fact, discussions by the families of the creativity and teamwork aspects of the project included implicit consideration of the '5R' skills. Overall, there is evidence that the project was successful in facilitating thinking about learning.

4.3 Fidelity

Was the intervention delivered as intended to all the treatment groups?

Fidelity was ensured through establishing a consistent pedagogy and designing tools that supported that consistency. These tools included specific outcomes for set-up meetings, a clear outline of the commitment the school was making to the project, set processes for family recruitment and common structures for the intervention inputs. These inputs were the staff development INSETs and the animation project elements, which included presentation with embedded discussion points and tasks complemented by family and teacher handbooks. In fidelity checks these were seen to work well in the majority of cases.

If there were any issues with fidelity what were the reasons?

Fidelity was impacted upon by individual schools' circumstances, for example the size of the classes, the interest and uptake for the animation project, staff changes and logistics. including technical issues with the hardware and software, the impact of Ofsted inspections and appropriateness of school learning environments. It was very challenging to ensure that the project was tailored to schools' contexts, accommodating current practices and approaches, while also keeping to the core standardised principles around recruitment, delivery and evaluation (as reported in the section describing the intervention).

What elements of the intervention are perceived to be adaptable?

The development of metacognitive knowledge and skilfulness can include a variety of techniques and ideas that aim to make the process of learning explicit to learners. As explained in the Introduction, pedagogies can draw on theoretical and pedagogic traditions such as learning to learn, thinking skills, self-regulation, habits of mind, dispositions, self-efficacy and self-esteem in relation to learning. As such, individual schools and teachers are able to draw on a repertoire that suits them and their contexts.

The timing of the animation project can be varied depending on the characteristics of the community within which the school is located. There are affordances and constraints to timetabling the course (during school, immediately after school or in the evenings) that impact on parents' ability to attend, the children's engagement and the schools' commitment.

Schools could coordinate the focus of the animations towards a theme. These could be introduced to fit with school agendas or to support transfer of learning from the course into the school curriculum. A narrower focus, or more structure to the animation brief, would have been supportive for some families, while others would have found it constraining. However, this connection could be seen by some schools as legitimising the animation course into more recognisable school learning.

5. Conclusion

5.1 Key Conclusions

Key conclusions
1. The headline findings provide no evidence of a statistically significant impact of Mind the Gap on attainment. There is not sufficient evidence to conclude that any observed effect was caused by the programme rather than occurring by chance.
2. The estimate of the programme's impact on pupils' metacognition was positive and statistically significant. This improvement in metacognition may in time lead to an impact on academic attainment.
3. Participating families and staff felt the intervention enhanced home–school relationships and strengthened the learning relationship between children and parents.
4. To increase the proportion of families who sign up to the animation course, it is important that schools clearly communicate its aims and promote the potential benefits of participation.
5. The difficulty in recruiting schools suggests that introducing Mind the Gap more generally may be difficult where schools are not committed to parental engagement or where they have difficulty delivering activities out of hours.

5.2 Limitations

There are two main limitations to the analysis. First, there was substantial dropout and this was concentrated among control schools. Dropout schools provided no outcome data and so could not feature in the impact estimates. While it is not inevitably the case that this will introduce a bias into the resulting estimates, it does mean that the estimates can no longer be regarded as truly experimental. The problem is exacerbated by a non-negligible degree of missing outcome data among those schools that did not drop out. This may be a consequence of the burden placed on participating schools. The number of data collection tools and the time they took to complete was challenging for many teachers and schools.

The second limitation is that, in practice, the treatment status of classes within schools did not agree in all cases with the randomised status. Such non-compliance is a common feature of randomised controlled trials and generally one can still adhere to the intent-to-treat (ITT) principle. However, in several cases the randomised status became meaningless in practice, most obviously when the teachers who were randomised (in most cases, classes were identified by their teacher) had left the school. This made it impossible to adhere to ITT. Instead, de facto treatment status was used for classes. This further reduces the extent to which the impact estimates for the components of Mind the Gap can be viewed as experimental.

A practical drawback of the project design is its reliance on technology and technical support to administer the InCAS tests at a level which some primary schools may not be able to provide. It is possible that logistical difficulties in delivery reduced the intensity of the input. These were identified in the process evaluation and included a lack of ICT equipment or support as well as turnover of staff responsible for project elements in schools.

The schools involved in the trial were drawn from a range of geographical areas within England – Devon, Birmingham, London and Manchester. This is helpful as a means of capturing some of the diversity of the pupil population. However, the challenge involved in recruiting a sufficient number of schools suggests there may be many schools that are not able to participate or, perhaps, are not interested in doing so. This implies that generalisability can only be viewed as extending to the type of school that can be reached by this type of approach. It is possible that, without the need to participate in a trial, there might have been more interest from schools. The randomised controlled design and the resulting data collection was a major barrier for some schools. This was particularly because of the lack of flexibility surrounding standardisation that for many schools, particularly small ones, was not necessarily conducive to school practice. Schools allocated to the control were challenged by the waiting list design and idea of quite intrusive data collection without, as they perceived, any of the benefits. In addition, the multiple data collection tools to be completed were seen as overly onerous by some schools and this resulted in non-completion.

5.3 Interpretation

The impact analysis has found no evidence of a statistically significant impact of Mind the Gap on the primary outcome. Taking the concerns discussed above as read, there is a question of how to interpret this finding. One consequence of the school dropout and prevalence of missing outcome data is that the number of schools (and pupils) observed is much smaller than was assumed at the design stage. Furthermore, the estimated effect sizes are all considerably below those assumed when designing the trial (0.35 to 0.45 standard deviations). Both these points suggest that the evaluation may not have had sufficient statistical power to be able to detect the size of effect that prevailed in practice. Consequently, we cannot rule out the possibility that Mind the Gap has an effect on attainment but, if it does, it is likely to be smaller than anticipated and to require a larger trial in order to detect it.

With the secondary outcomes, there was similarly no significant impact on attainment or pupils' views of their relationship with their parents. However, significant increases in some aspects of metacognition were found. Specifically, pupils in intervention schools who were eligible for the animation classes scored higher on their productive thinking and metacognitive skilfulness than pupils who were not eligible. In considering this, it is relevant that only slightly more than a quarter of eligible families participated in the animation course. We have not attempted here to assess the impact of the course on participants since the trial was not designed to deliver this estimate. However, if we believe the estimated positive metacognition impacts of eligibility are driven by course participation, we would expect the effects on participants to be greater than the effects on eligible pupils as a whole. It is also relevant to remember that these effects in turn reflect varying degrees of participation since, among those who did participate, only 58% attended all five sessions. It appears that school characteristics are more important than pupil characteristics in the participation decision. In particular, participation was low among schools serving poorer areas. This points to the challenge of enabling such an intervention to reach poorer children.

The qualitative analysis also provided some positive indications. The animation course was valued by participating families and school staff for a number of reasons. These include its perceived role in enhancing home–school relationships, nurturing the learning relationship between children and adults and developing creative ICT projects which enhance the school's out of hours provision. The focus on ICT, and animation in particular, was attractive to parents. There were indications that some schools have continued to run the animation project to engage parents with their child's learning. Findings from the process evaluation suggest that projects of this type work well in small group settings where participants can be given individual support and, if necessary, additional motivation.

However, there are indications that the metacognition component of the project was not understood by parents as well as it might have been. The process evaluation found that, while families recognised that they had undergone a learning process, they were not able to fully articulate the ways in which they had benefited. This may have been because the input was not sufficiently intensive, or alternatively due to content or delivery. This aspect of the project appeared to work well in schools which had used similar techniques before, suggesting that it may take some time to have a significant impact.

5.4 Future research and publications

It is hard to avoid the conclusion that the robustness of the impact analysis has, to some extent, been compromised by dropout and the practical complications surrounding delivery. There are lessons to be had from this experience. Partly, it showcases the difficulties that can be encountered when trying to achieve strong evidence of programme effectiveness in a school setting. There were indications that features of the programme that were desirable from the research point of view did not sit comfortably with the ethos and working practice of some schools. Since the success of studies like this relies on the full cooperation of participating schools, future evaluations may benefit from trying to factor in some degree of flexibility and, in any event, to minimise the burden on all stakeholders.

Short of repeating the exercise, there are opportunities for future research using the database that has been assembled in the course of this evaluation. One aspect that has been left unexplored in this report is the effect of participation in the animation course – could this affect attainment or children's perception of the relationship with their parents? To explore such questions requires non-experimental techniques since the trial randomised eligibility rather than participation. However, as an informal exploration, Table 7 shows mean outcomes among PETT classes according to the number of sessions attended. Here we distinguish between zero classes (non-participation), one to four classes (partial participation) and five classes (full participation). The final column in the table gives a p-value of the null hypothesis that there is no variation across these three groups. From this, it appears that variation across the three groups in the primary outcome is significant for attainment outcomes, with those attending more sessions achieving higher scores. For the other secondary outcomes, there is no evidence of statistically significant variation.

While perhaps intriguing, the possibility that the primary outcome varies with the number of sessions can be interpreted in more than one way. One possibility is that attending more sessions improves outcomes. Alternatively, the number of sessions may not be important but the less able pupils may drop out before the end. Unfortunately, we have no way of distinguishing between these competing explanations.

Table 7. Mean outcomes by number of animation sessions attended

	Number of sessions attended			p-value
Outcome	0	1-4	5	
Literacy and numeracy	111.98	111.39	120.19	0.03
s.d.	20.06	20.69	15.62	
N	139	17	53	
Reading	112.08	111.45	121.43	0.03
s.d.	23.88	22.46	19.15	
N	153	20	54	
Maths	112.92	113.35	121.03	0.01
s.d.	17.67	20.01	14.85	
N	157	22	54	
Mental arithmetic	110.04	111.28	117.93	0.05
s.d.	21.15	24.10	15.60	
N	160	23	55	
SDQ	19.66	18.22	20.16	0.32
s.d.	4.35	5.78	4.27	
N	136	18	38	
Building understanding	7.83	11.44	7.76	0.17
s.d.	8.30	14.37	10.00	
N	172	27	62	
Information gathering	14.23	13.81	13.26	0.72
s.d.	8.51	6.69	7.45	
N	172	27	62	
Productive thinking	3.96	1.52	3.56	0.29
s.d.	8.05	3.25	7.06	
N	172	27	62	
Metacognitive knowledge	0.55	0.00	1.34	0.12
s.d.	2.89	0.00	4.32	
N	172	27	62	
Metacognitive skilfulness	1.92	2.11	1.65	0.89
s.d.	4.82	4.26	4.42	
N	172	27	62	

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Appendices

Appendix I Self-description questionnaire

Questionnaire: You and your parents or carers

Name: ..... Circle one: Boy Girl

School: ..... Year: .....

Age: ..... Teacher: .....

Date: .....

Please read these instructions first!

Don't worry, this is not a test. We will keep your answers private.

Before you start, here is an example. A pupil named Bob has already answered the first example to show you how to do it. In the second example you must choose your own answer by circling the number.

Statement Please circle the number which represents how *you* feel)	Strongly Disagree	Disagree	Agree	Strongly Agree
I like talking with my parents.	1	2	3	(4)

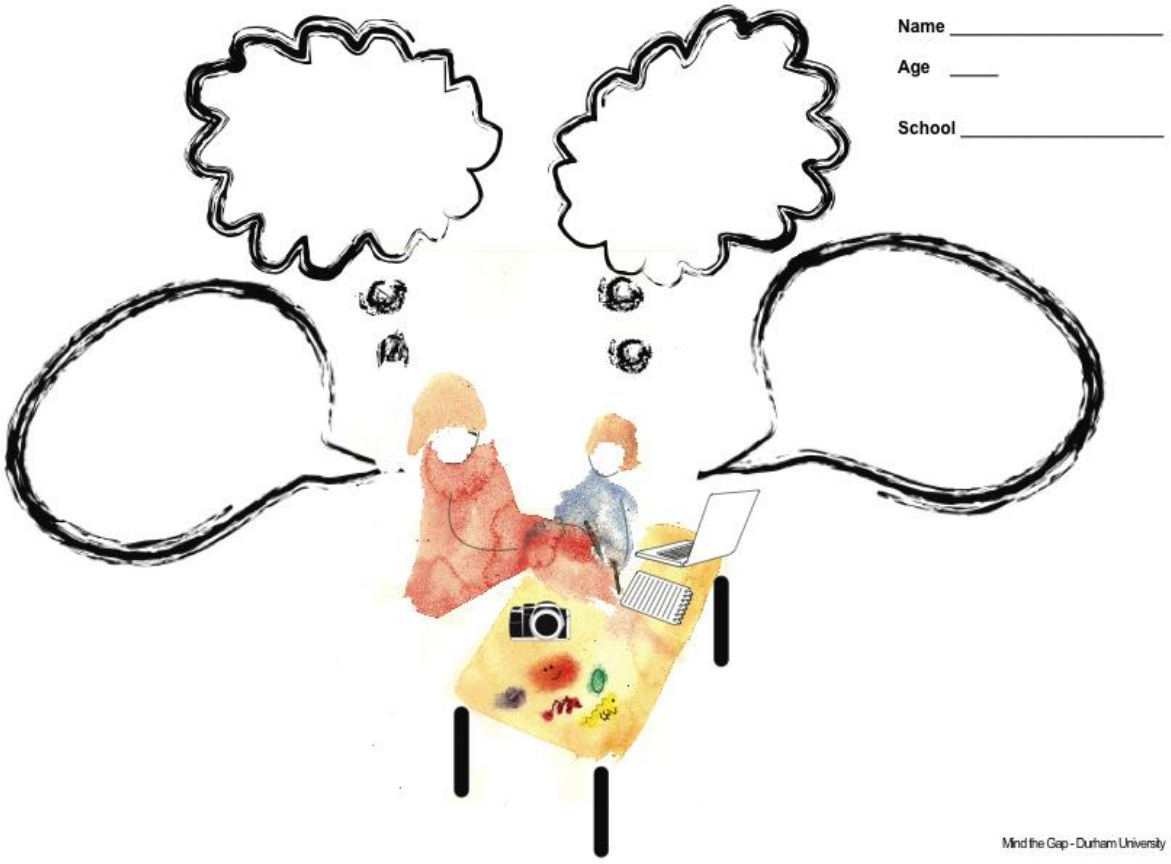
Bob circled the number 4, which was the answer "Strongly Agree". This means that he really likes talking with his parents. If Bob didn't like talking with his parents he would have answered "Strongly Disagree" (number 1) or "Disagree" (number 2).

Now it is your turn. Please don't leave any questions blank.

Please circle the number which represents how *you* feel	Strongly Disagree	Disagree	Agree	Strongly Agree
My parents understand me	1	2	3	4
My parents are usually unhappy or disappointed with what I do	1	2	3	4
I like my parents	1	2	3	4
My parents like me	1	2	3	4
If I have children of my own, I want to bring them up like my parents raised me	1	2	3	4
My parents and I spend a lot of time together	1	2	3	4
My parents are easy to talk to	1	2	3	4
I get along well with my parents	1	2	3	4
My parents and I have a lot of fun together	1	2	3	4

Thank you for your answers

Appendix II Pupil Views Template



Appendix III School Memorandum of Understanding

Durham University

Shaped by the past, creating the future

Dear Headteacher

Consent form for Mind the Gap animation/Learning to Learn project

In taking part in 'Mind the Gap', your school has consented informally to be part of the national evaluation of the project by Durham University. This form requests signed consent for Durham University and its project partners to carry out the evaluation with you school, including the collection, analysis, reporting and publication of data and findings.

Pupils' assessment responses and all other pupil data will be treated with the strictest confidence. The responses will be collected online by the Centre for Evaluation and Monitoring (CEM) at Durham University and accessed by Durham University, School of Education. Named data will be matched with the National Pupil Database and shared with the National Institute for Economic and Social Research (NIESR) and EEF for research purposes. No individual school or pupil will be identified in any report arising from the research. Data will be held securely for up to 7 years before being destroyed. The Department for Education have been consulted about the use of the National Pupil Database and have given their agreement.

Your school has been informed about the evaluation through an induction process which includes an introduction to the project from the Campaign for Learning, training sessions from Durham University and documentation outlining the research. You have the opportunity to request further information and support at any time. Attached with this form is an 'FAQ' sheet which provides further details about the research. Please contact us should you require further details or clarification of issues relating to the research: Helen Burns at h.l.burns@durham.ac.uk Tel: 0191 3348130.

We ask that you sign beneath the following statement to consent for your school to be part of the research. Please post your consent back to us at: Helen Burns, School of Education, Durham University, Leazes Road, Durham, DH1 1TA. You may like to keep a copy of this letter and form for your own records.

All information collected will be stored electronically and/or as a hard copy; kept in a locked cabinet, in accordance with the data protection act and used by this project and its partners only. By signing you are acknowledging that you understand and agree to us holding your data and using it for the project. You are giving your consent for your school to be included in this project. You are, of course, free to opt out of this study at any time by contacting: Helen Burns at h.l.burns@durham.ac.uk tel: 0191 3348130.

Signed: _____

School: _____

Date: _____

National Institute of Economic and Social Research

Campaign for Learning

Education Endowment Foundation

Durham University, School of Education Leazes Road Durham DH1 1TA UK. Tel: +44 (0)191 334 8310

https://www.dur.ac.uk/education/

Appendix IV Frequently asked questions sheet

'Mind the Gap' animation project

Evaluation by Durham University

Frequently Asked Questions for schools

Is the information collected made anonymous?

The data from each child is given a unique code which links their data anonymously. The key which links codes to individual children is kept securely at Durham University in full compliance with data protection legislation. Privacy and confidentiality are of primary importance to us. All original copies of response forms will be held until 2020 (seven years) when they will be destroyed. Any data used in presentations or publications will be averaged: results will never include any details about any individual child, in any circumstance. No child will ever be personally identified by or through the project.

Who else has access to this information? Will the school get to see it, who are the projects partners who are looking at it?

The Mind the Gap team at Durham University will be storing and analysing these data. Your child's school will have access to the results of InCAS testing as a way to assess each child's academic progress and development, identifying any areas a child finds challenging as well as areas of strength and to complement their own assessment data. The tests are undertaken using a computer and the children usually enjoy the experience. Our project partners are the Campaign for Learning and the Institute for Economic and Social Research. The project is funded by the Education Endowment Foundation who will also receive a copy of the results and who will track the impact of projects anonymously in national tests with the permission of the Department for Education

Should you wish to know more about your project partners, here are their website addresses:

www.campaign-for-learning.org.uk/

www.niesr.ac.uk

www.dur.ac.uk/education/

http://educationendowmentfoundation.org.uk

Will schools get to see the results of the research?

Once this project reaches completion in 2014 we will start the process of collating and analysing these data. We will be happy to provide schools with details of our overall results, and a summary in a form which they could circulate to parents. We work with anonymised data, so we would not hold records on individual children.

How many schools are involved in this project?

There are 50 primary schools involved in the project, from Birmingham, Devon, Manchester and London

Who can I contact if I have any questions regarding this project?

Please contact Helen Burns, Project Manager for Mind the Gap, Durham University, School of Education, DH1 1TA at **h.l.burns@durham.ac.uk** or on 0191 3348130.

Why have parents and carers not been asked for consent for children to take part in the study as a whole?

We ask the school to agree to take part in the project as we are not comparing individual children's personal data but comparing classes between schools. We therefore ask for consent at school level so that we know that schools are happy to share their class level attainment data. We do ask parents for consent for any video or photography, just in case this takes place (although this is very rare due to the scale of the project). Additionally, researchers will ask for further consent where families are being filmed for case studies or are involved in a recorded interview. We also offer parents and carers the opportunity to opt out at any stage so that any information about them their child or children is not included in the project.

This commitment is outlined by the Campaign for Learning in their induction for the school and also at the training events for schools involved in the programme, delivered by the Campaign and by Durham University. The project has ethical clearance from Durham University's School of Education Ethics Committee and the Education Endowment Foundation have consulted the Department for Education about both the legal and ethical issues involved in analysing school attainment data, as our project is one of over 50 which they have funded.

Have schools had a chance to communicate with parents and to ask the Durham University evaluation team questions about the study?

Almost all schools have had the opportunity to attend a local training session in relation to the project. Additionally, they have had an induction to the programme from the Campaign for Learning as well as regular communication from the Durham University evaluation team. All schools have been made aware of the evaluation as a condition for taking part in the animation project. The Durham University team are happy to answer any questions you have now, or throughout the course of the study h.l.burns@durham.ac.uk

How long will the project last, when will it be completed and when will we be able to see the results?

Data collection will be completed in 2014. We expect to have the results available by 2015 and will provide schools who have been involved with a summary sheet.

Appendix V Parental registration form (initial)

Mind the Gap: registration form

Full Name:	Postcode:
Phone:	Mobile:
Email:	School's Name:
Name of Child (age):	Name of Child (age):
Name of Child (age):	Name of Child (age):

Country of Birth: ◯UK ◯OTHER If other please specify:

Qualification: What age did you complete full-time education?

Marital Status: Please select from the following options:

◯Single, (never partnered), ◯Married, ◯Civil Partner, ◯Separated, ◯Other, Please specify:

Do you live with your children? ◯Yes, ◯No, ◯Other, Please specify:

What's your relationship with the child? ◯Parent, ◯Uncle/Aunt, ◯Other, Please specify:

Employment Status: Please select from the following:

◯Employee, ◯Self-Employed, ◯Unemployed, ◯Other, Please Specify:

If you are working do you work less than 30 hours a week? ◯Yes, ◯No

CONSENT FORM

Please tick the boxes below to state that you understand and agree with the following:

Photo/video consent – You are happy for photos and videos of yourself and the children you are responsible for to be shown nationally via related events, specific websites and all other appropriate opportunities.

Safeguarding – Please see reverse of page for full information. You are happy and understand that you are responsible for your child/ren during the course. We have taken steps to safeguard all adults and children during our courses, by ticking you agree to abide by these steps.

Disclaimer – All information collected (such as this form) will be stored electronically in accordance with the data protection act and used by this project and its partners only. You understand and agree to us holding your data and using it on the project.

◯**Photo/video consent** ◯**Safeguarding** ◯**Disclaimer**

Appendix VI Parental registration form (revised)

Mind the Gap: Parents' Questionnaire

Parent's Full Name:

School's Name:

Name of Child (age): | Name of Child (age):

Name of Child (age): | Name of Child (age):

Country of Birth: ◯UK ◯OTHER If other please specify:

Qualification:

At what age did you finish your education? :

Marital Status: Please select from the following options:
◯Single, ◯Married, ◯Civil Partner, ◯Separated, ◯Other, please specify:

Do you live with your children? ◯Yes, ◯No, ◯Other, please specify:

What's your relationship with the child? ◯Parent, ◯Uncle/Aunt, ◯Other, Please specify:

Employment: Please select from the following: ◯Full-time ◯Part-time
◯Employee, ◯Self-Employed, ◯Unemployed, ◯Other, Please Specify:

CONSENT FORM

All information collected (such as this form) will be stored electronically and/or as a hard copy; kept in a locked cabinet, in accordance with the data protection act and used by this project and its partners only. You understand and agree to us holding your data and using it on the project.

Signed: _____

Date: _____

Appendix VII Teacher questionnaire

Questionnaire for Teachers Prior to Mind the Gap

The purpose of this questionnaire is to collect baseline information about the child and their parents before the intervention. We need to know the impacting variables that might impact on the measures.

For each child in the class, could you complete the following questions. Use 1 box per child.

Forename _____ **Surname** _____

Age ____years _____months **Gender** Male ☐ Female ☐

National Database Identification Number _____

Educational Need (Tick appropriate boxes)

English as Additional Language ☐

Special Educational Need/s (tick all appropriate):

Statement ☐ School Action/Action Plus ☐

Learning difficulties ☐ Behavioral difficulties ☐

Other ☐ Free School Meals ☐

Gifted & Talented (as defined in *your* school) ☐

Parental Engagement in School (Tick the appropriate boxes to show the extent to which each of the child's parents or carers is involved in school.)

Parent/Carer A: Female ☐ Male ☐

Drops the child off at school ☐ Regularly attend parents' evenings ☐

Volunteers on school trips ☐ Volunteers in the classroom ☐

Attends school events (e.g. assemblies, fetes) ☐ Active member of the PTA ☐

Reads with child ☐

Parent/Carer B: Female ☐ Male ☐

Drops the child off at school ☐ Regularly attend parents' evenings ☐

Volunteers on school trips ☐ Volunteers in the classroom ☐

Attends school events (e.g. assemblies, fetes) ☐ Active member of the PTA ☐

Reads with child ☐

Appendix VIII Teacher interview schedule

Mind the Gap

Participant Teacher Interview

This interview contributes to Durham University's evaluation of 'Mind the Gap'. The research is funded by the Education Endowment Foundation and seeks to investigate links between the Mind the Gap animation project and attainment, as well as looking more broadly at the learning which takes place. The data supplied through the interview will be used to complement data collected via InCAS assessments, questionnaires and family interviews, in gaining a full picture of the impact of the project.

Data will be used only by Durham University and will be treat confidentially and anonymously. All data will be held securely and researchers will comply with the Data Protection Act (1998). You are free to withdraw consent at any time. Please feel free to ask for further information by contacting Helen Burns at: h.l.burns@durham.ac.uk

This interview should take around 30-45 minutes. You will be asked to confirm consent to be recorded at the start of the interview.

1. **Could you tell us about the Mind the Gap project as you experienced it?**
    - **You might like to comment on the following:**
        - Introduction and recruitment
        - How difficult was it to get parents involved?
        - Did you see parents that you didn't see previously?
        - Duration and timing
        - Delivery and facilitators
        - Structure and content
        - Course materials (worksheets etc.)
        - End result
        - Major impacts
        - How well did it fit with school practice: home–school partnership work, learning to learn approaches already in use?
        - Do you feel that the intervention was successful?

2. **Were there any particular families that you felt the Mind the Gap process was particularly useful for? Please explain why.**
   - **You might consider different perspectives:**
     - the child
     - the parent
     - the school
     - parent-child relationships
     - home–school relationships
   - **The following types of learning might be useful to think about:**
     - Curriculum attainment
     - Skills
     - Soft skills
     - Motivation and disposition
     - Creative imagination
     - Metacognition (thinking about learning)

3. **Were there any particular families that you felt the Mind the Gap process was not particularly useful for? Please explain why.**
   - **The prompts from the previous question might be useful**

4. **Please use the table below to consider the families that took part in the Mind the Gap project. For each one could you rate how successful you think their:**
   - **Learning experience was?**
   - **Animation experience was?**

   Please give each family a mark out of 10 (with 10 being VERY SUCCESSFUL and 1 being not successful)

   The interviewer will ask you to justify your ratings and talk through your thinking.

Family name	Learning experience	Animation experience

5. **Would you do the project again?**

6. **On a scale of 1-5, how glad are you that you participated?**

Thank you for your time and thought

Appendix IX Teacher interview schedule at 6 months post project

Mind the Gap

Participant Teacher Interview at 6 months post project

This interview contributes to Durham University's evaluation of 'Mind the Gap'. The research is funded by the Education Endowment Foundation and seeks to investigate links between the Mind the Gap animation project and attainment, as well as looking more broadly at the learning which takes place. The data supplied through the interview will be used to complement data collected via InCAS assessments, questionnaires and family interviews, in gaining a full picture of the impact of the project.

Data will be used only by Durham University and will be treat confidentially and anonymously. All data will be held securely and researchers will comply with the Data Protection Act (1998). You are free to withdraw consent at any time. Please feel free to ask for further information by contacting Helen Burns at: h.l.burns@durham.ac.uk

The interview takes place by telephone. You will be asked for consent for this conversation to be recorded at the start of the interview.

This interview should take around 30 minutes

1. Given that it has been 6 months since you took part in the project, could you reflect on the subsequent impact of the Mind the Gap?

    - You might like to comment on the following:
        - Major, sustained impacts
        - Instances where the project has been seen to influence the behaviour/dialogue/actions of a child
        - Evidence of increased/different support from parents and carers for children's learning
        - Relationships between parents/carers and school
        - Attainment
        - Metacognition
        - Imagination/creativity
        - Influence on school practice
        - Influence on your personal practice
        - Do you feel that the intervention was successful?

2. Were there any particular families that you felt the Mind the Gap process has had a sustained or delayed impact on, revealed in the 6 months post project? Please explain why.
   - You might consider different perspectives:
     - the child
     - the parent
     - the school
     - parent-child relationships
     - home–school relationships

   - The following types of learning might be useful to think about:
     - Curriculum attainment
     - Skills
     - Soft skills
     - Motivation and disposition
     - Creative imagination
     - Metacognition (thinking about learning)

3. Were there any particular families that you felt had not benefitted from the Mind the Gap process at the time but have shown evidence of positive impact in the last 6 months? Please explain why.

   - The prompts from the previous question might be useful

4. In our previous interview, you were asked to grade families that took part in the Mind the Gap project in terms of how successful you thought their learning and animation experiences were. Please see the table below as a reference to the grades you allocated for ‘learning experience’:

Family	Grade

Focussing on their learning experience, please consider the families for which you said the experience had been successful:

- How sustained has this success been for these families?

Focussing on the learning experience of families for whom you thought the experience had been less successful:

- Do you feel that they may have gained longer term benefits from being involved in the Mind the Gap programme?

5. Would you do the project again?

6. On a scale of 1-5, how glad are you that you participated?

THANK YOU FOR YOUR TIME AND THOUGHT

Appendix X Family interview schedule

Durham University

'Mind the Gap'

Participant Family Interview

Introduction

The interview will take place with you, the child you made the animation with and one researcher from Durham University. The interview will be recorded so that the interviewer can look at it again later. It will be very informal and more like a conversation but with a bit of structure to help things along. We will treat what you tell us as confidential and neither you nor your child will be identified in any report. The interview will last about 45 minutes. We would like to use your handbook and the film you made as a starting point for our conversation. **Please could you bring your handbook** with you to the interview? If you don't have this any more, don't worry but please come anyway. We will try to make sure the film which you made is on hand.

Why we are interested in your experiences

Initial findings relating to an animation project similar to Mind the Gap, indicated that it improved children and young people's motivation and performance at school. Funded by the Education Endowment Foundation (EEF); Durham University, The Campaign for Learning and the National Institute for Economic and Social Research (NIESR) are undertaking a 2 year, national evaluation of Mind the Gap to look closer at the impact on motivation and performance. We would like to get *your* views on the project as part of this.

If you would like to know anything else about the research, please feel free to ask us questions either before or at the interview. We are more than happy to answer any questions you may have. Contact: Helen Burns at **h.l.burns@durham.ac.uk** or on 0191 3348310.

Below are the questions you will be asked during the interview. We give you these in advance so that you have time to think about your responses and so that there are no surprises!

Introduction to the questions

I have 3 main questions to ask you:

1. What did you do on the project?
2. What were the effects/impacts of the project?
3. What did you learn?

Please use your family handbook to help you to talk about your experiences. We can have a look at the film that you made too.

Question 1 (asked to both child and adult to give joint answers)

What did you do?

- Why did you get involved in the project?
- What did you hope to get from the project?
- Tell us your experiences of the project?
- What happened each week?
- What was at the start, middle and end of the project?
- What skills were you using? ICT/creative/ learning?
- What did you do with the handbook?
- What did you make?
- Is there anything you would do differently if you were to go on a similar project together in the future?

Question 2

Did the project have an effect/impact on you and if so, how and why?

Adult

- Your learning?
- Did you see any changes in each other (behaviour, feelings)?
- Did you notice any changes in yourself (behaviour, feelings)?
- Have you used any of the knowledge/ skills (relationship/ ICT/ creative/ learning) from the project since?
- Your relationships with school?

Child

- Your learning?
- Did you see any changes in each other (behaviour, feelings)?
- Did you notice any changes in yourself (behaviour, feelings)?
- Have you used any of the knowledge/ skills (relationship/ ICT/ creative/ learning) from the project since

Family

- Your family relationships?
- Your learning?
- Have you used any of the knowledge/ skills (relationship/ ICT/ creative/ learning) from the project since?
- Would you recommend this project to other families? Why?

Question 3

What did you *learn*?

Adult

- How do you feel about yourself as a learner? Has the project impacted on this at all?
- Do you have any examples of how you've applied what you learned during/after the project?
- How would you rate what you learned? Give a mark out of 10 and why?
- How would you rate your film? Give a mark out of 10 and why?

Child

- How do you feel about how well you do at learning? Has the project impacted on this at all?
- Do you have any examples of how you've applied what you learned during/after the project?
- How would you rate your learning? Give a mark out of 10 and why?
- How would you rate your film? Give a mark out of 10 and why?

Family

- Did you learn well together?

Thank you for answering the questions. Is there anything else you would like to add which we've not discussed?

Appendix Pupil Views Template coding scheme

Pupil Views Template data are a qualitative tool that at analysis stage was coded using a deductive coding scheme to measure the declarative cognitive and metacognitive awareness of the children. The written content of each pupil views template was transcribed and imported into NVivo11 for analysis using a deductive coding procedure (described below). A code was applied based on the sense and meaning of a pupil's response with a judgement made by the researchers as to the intended meaning. A category could therefore be applied to a single word, to a sentence fragment, a full sentence or a paragraph. Results are presented in terms of total words coded as the most sensitive output of NVivo (both proportionally and in relation to the research aims).

The statements were categorised using Moseley *et al.*'s (2005a) model of thinking (figure A11.1). This model was chosen as it represents a comprehensive synthesis of learning and thinking theory. The statements were categorised as to whether they were predominantly evidence of cognitive skills (information gathering, building understanding, or productive thinking; and/or whether they were evidence of metacognitive thought (strategic and reflective thinking in Moseley *et al*.'s model).

STRATEGIC AND REFLECTIVE THINKING		
Engagement with and management of thinking/learning, supported by value-grounded thinking (including critically reflective thinking)		
COGNITIVE SKILLS		
Information-gathering	*Building understanding*	*Productive thinking*
Experiencing, recognising and recalling Comprehending messages and recorded information	Development of meaning (e.g. by elaborating, representing or sharing ideas) Working with patterns and rules Concept formation Organising ideas	Reasoning Understanding causal relationships Systematic enquiry Problem-solving Creative thinking

Figure A11.1: Frameworks for Thinking model used as a basis for the coding scheme (adapted from Moseley et al., 2005)

The following definitions based on this analysis were used:

- Information gathering**: Characterised by recall of ideas and processes and recognition or basic comprehension of information they have been told or have read.**

- Building understanding**: This required some organisation of ideas and recollections, some idea of relationships or connections, with some development of meaning about implications and/or patterns which could be applied or interpreted.**

- Productive thinking**: These comments tended to show more complex thinking such as reasoning, problem solving and some movement of understanding beyond the concrete and towards the abstract. Ideas that were generalisable or creative were placed also in this category.**

- Strategic and reflective thinking: **Comments represented an awareness of the process of learning, including a reflective or strategic element to the statement or explicit thinking about learning (metacognitive awareness of learning).**

The statements coded as strategic and reflective, and therefore indicative of metacognition, were then further analysed for evidence of metacognitive knowledge and metacognitive skilfulness (Veenman *et al.* 2005). These categories were defined in the following ways:

- Metacognitive knowledge: **Comments in this category showed an understanding that the learner could think about learning, and could talk about some of the processes which supported their own learning (declarative knowledge).**

- Metacognitive skilfulness: **Comments within this category involved the procedural application and translation of thinking and learning skills across different contexts or for different purposes (for definitions see also Veenman & Spaans (2005), p 160).**

This coding system was checked for inter-rater reliability using Cohen's Kappa with an agreement of 84%, 20% (n=75) of the total sample were double coded by another researcher, and an intra-rater agreement of 98%, 20% of total sample double coded at the end of the coding process compared to the beginning. Exemplification of the coding can be seen in Table 1 where examples of each coding category are given.

Table A11.1: Table exemplifying the different coding groups

Code		Example quote
Information gathering		Shall we use the camera? *(representative of recall of events)*
Building understanding		But Daddy how do we play games? *(making connections)*
Productive thinking		Dad I don't do it like that. I do it like Mr Bowles taught me. *(using ideas from beyond the current context)*
Strategic & Reflective Thinking	Metacognitive Knowledge	Can you give me a hand, I don't get this, can you help? *(awareness of a learning process)*
	Metacognitive Skilfulness	You need to do a little more practice for yourself *(ability to apply knowledge of the learning process)*

Appendix XII Detailed estimation results

The tables in this appendix present the full estimation results for all of the outcomes considered. In each case, there are three columns of results. The first column (PETT vs Control) shows the overall impact of Mind the Gap. The second column (TT vs Control) shows the impact of the teacher training element of Mind the Gap. The third column (PETT vs TT) shows the impact of the parental engagement element of Mind the Gap over and above the impact of the teacher training element.

Table A12a. Literacy and numeracy, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-1.429	0.086	-2.662
	[2.866]	[5.497]	[1.742]
Age (months)	-7.272	-8.316	5.702
	[4.140]	[4.311]*	[17.161]
Age squared	0.036	0.042	-0.028
	[0.020]	[0.021]**	[0.084]
Female	1.815	3.302	-0.917
	[0.947]	[1.205]***	[1.653]
EAL	-0.533	0.821	-2.021
	[1.507]	[1.944]	[2.664]
SEN	-5.908	-3.857	-8.286
	[1.370]**	[1.700]**	[2.363]***
FSM	-2.566	-4.055	-3.941
	[1.228]*	[1.589]**	[2.082]*
EALSENFSM missing	-8.193	-5.99	-22.033
	[2.970]**	[4.374]	[7.679]***
Pre-test	0.835	0.839	0.814
	[0.035]**	[0.044]***	[0.059]***
Pre-test missing	83.164	85.431	83.894
	[4.017]**	[4.984]***	[6.752]***
Blocking variables	y	y	y
Constant	391.405	429.674	-253.705
	[210.088]	[217.461]*	[879.982]
Log likelihood	-1,819.42	-1,003.12	-678.27
Chi-squared test statistic of RE	19.28	9.95	0.00
Chi-squared p-value	0.00	0.00	1.00
N	492	278	186
Random effects			
- school-level variance	20.227	29.888	0
	[11.516]	[27.313]	[0]
- pupil-level variance	102.254	91.297	111.214
	[6.733]	[8.055]	[12.028]
N schools	22	12	6
N observations per school			
min per school	4	14	13
max per school	39	39	48
mean per school	22	23	31
ICC	0.165	0.247	0

Table A12b. Reading score, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-0.885	1.944	-3.646
	[3.203]	[6.140]	[2.072]*
Age (months)	-6.549	-6.117	-6.827
	[5.108]	[5.153]	[19.331]
Age squared	0.032	0.031	0.032
	[0.025]	[0.026]	[0.094]
Female	1.191	2.342	-0.416
	[1.151]	[1.395]*	[1.891]
EAL	-0.514	0.176	-4.11
	[1.802]	[2.121]	[3.066]
SEN	-6.633	-5.752	-7.968
	[1.636]**	[1.958]***	[2.677]***
FSM	-1.545	-4.524	-3.325
	[1.495]	[1.766]**	[2.436]
EALSENFSM missing	-4.763	1.725	-25.77
	[3.449]	[4.922]	[9.446]***
Pre-test	0.794	0.812	0.826
	[0.033]**	[0.039]***	[0.055]***
Pre-test missing	75.412	94.782	133.232
	[11.682]**	[17.410]***	[22.621]***
Time between tests	-0.028	0.044	0.204
	[0.048]	[0.074]	[0.091]**
Blocking variables	y	y	y
Constant	367.016	315.458	348.938
	[259.541]	[260.062]	[991.300]
Log likelihood	-2,116.93	-1,180.72	-832.66
Chi-squared test statistic of RE	15.31	7.87	0.73
Chi-squared p-value	0.00	0.00	0.20
N	538	310	215
Random effects			
- school-level variance	23.83	29.109	38.767
	[14.085]	[27.253]	[86.190]
- pupil-level variance	164.868	135.677	168.718
	[10.356]	[11.298]	[16.957]
N schools	23	12	6
N observations per school			
min per school	1	17	20
max per school	44	44	49
mean per school	23	26	36
ICC	0.126	0.177	0.187

Table A12c. Maths score, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-1.503	-2.126	-0.396
	[1.970]	[3.551]	[1.400]
Age (months)	-1.853	-4.3	-3.406
	[3.462]	[3.678]	[13.241]
Age squared	0.009	0.022	0.018
	[0.017]	[0.018]	[0.065]
Female	0.686	-0.264	-0.55
	[0.780]	[0.980]	[1.365]
EAL	-1.95	0.366	-1.567
	[1.228]	[1.524]	[2.045]
SEN	-3.022	-2.553	-6.67
	[1.128]**	[1.401]*	[1.835]***
FSM	-1.127	-2.801	1.495
	[1.013]	[1.251]**	[1.684]
EALSENFSM missing	-4.495	-1.337	-12.571
	[2.329]	[3.413]	[5.577]**
Pre-test	0.862	0.878	0.895
	[0.029]**	[0.037]***	[0.050]***
Pre-test missing	84.549	102.816	112.132
	[8.560]**	[15.032]***	[11.322]***
Time between tests	-0.019	0.051	0.091
	[0.034]	[0.065]	[0.042]**
Blocking variables	y	y	y
Constant	118.986	214.416	166.245
	[175.838]	[186.170]	[678.110]
Log likelihood	-2,052.22	-1,127.51	-778.24
Chi-squared test statistic of RE	9.99	4.01	0
Chi-squared p-value	0.00	0.02	1.00
N	571	322	219
Random effects			
- school-level variance	8.601	9.683	0
	[5.506]	[11.303]	[0.000]
- pupil-level variance	81.121	70.883	84.795
	[4.937]	[5.791]	[8.417]
N schools	23	12	6
N observations per school			
min per school	3	18	16
max per school	48	48	50
mean per school	25	27	37
ICC	0.096	0.12	0

Table A12d. Mental arithmetic score, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-2.975	-2.276	-0.8
	[2.899]	[5.789]	[2.351]
Age (months)	-2.663	-5.943	-0.556
	[5.084]	[6.140]	[21.664]
Age squared	0.013	0.03	0.004
	[0.025]	[0.030]	[0.106]
Female	1.058	2.173	-3.531
	[1.253]	[1.655]	[2.188]
EAL	2.458	1.568	2.522
	[1.946]	[2.523]	[3.274]
SEN	-8.865	-3.618	-11.214
	[1.827]**	[2.324]	[3.035]***
FSM	-5.309	-3.613	-4.764
	[1.614]**	[2.100]*	[2.820]*
EALSENFSM missing	-5.735	-4.405	-13.584
	[3.606]	[5.558]	[9.150]
Pre-test	0.648	0.709	0.602
	[0.039]**	[0.049]***	[0.063]***
Pre-test missing	60.682	62.04	91.015
	[13.509]**	[22.979]***	[22.568]***
Time between tests	-0.023	-0.056	0.134
	[0.054]	[0.098]	[0.090]
Blocking variables	y	y	y
Constant	181.38	335.75	45.914
	[257.842]	[310.390]	[1,108.623]
Log likelihood	-2,280.86	-1,281.15	-904.42
Chi-squared test statistic of RE	7.68	2.29	0.07
Chi-squared p-value	0.00	0.07	0.40
N	564	321	225
Random effects			
- school-level variance	17.626	22.929	10.507
	[12.614]	[30.249]	[51.133]
- pupil-level variance	207.185	199.908	228.721
	[12.697]	[16.355]	[22.428]
N schools	23	12	6
N observations per school			
min per school	3	19	25
max per school	50	50	48
mean per school	25	27	38
ICC	0.078	0.103	0.044

Table A12e. SDQ Likert score, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-0.06	0.749	0.244
	[0.651]	[0.767]	[0.633]
Age (months)	0.026	0.002	0.132
	[0.046]	[0.066]	[0.079]
Age squared	0	0	-0.001
	[0.000]	[0.001]	[0.001]
Female	0.947	0.202	0.655
	[0.325]**	[0.417]	[0.519]
EAL	0.014	0.719	-1.844
	[0.459]	[0.525]	[0.758]*
SEN	1.23	0.516	0.869
	[0.414]**	[0.512]	[0.627]
FSM	-0.66	-1.41	0.53
	[0.375]	[0.480]**	[0.599]
EALSENFSM missing	-0.966	-0.89	-0.794
	[1.514]	[1.443]	[1.697]
Pre-test	0.523	0.485	0.682
	[0.047]**	[0.068]**	[0.073]**
Pre-test missing	9.034	8.715	11.635
	[1.333]**	[1.937]**	[1.755]**
Time between tests	-0.007	-0.024	0.006
	[0.012]	[0.021]	[0.020]
Time between tests missing	-0.264	-4.272	3.163
	[3.033]	[5.152]	[4.966]
Blocking variables	y	y	y
Constant	9.105	14.384	2.24
	[3.057]**	[5.034]**	[5.315]
Log likelihood	-1,393.80	-853.39	-587.28
Chi-squared test statistic of RE	0.000	0.15	0.000
Chi-squared p-value	1	0.35	1
N	516	318	217
Random effects			
- school-level variance	0.000	0.182	0.000
	[0.000]	[.564]	[0.000]
- pupil-level variance	12.997	12.661	13.079
	[0.827]	[1.042]	[1.305]
N schools	19	12	6
N observations per school			
min per school	18	7	27
max per school	51	51	49
mean per school	27	27	36
ICC	0.000	0.014	0.000

Table A12f. PVT measure 1: Building understanding, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-1.497	1.822	-1.177
	[2.403]	[3.329]	[1.726]
Age (months)	-0.161	-0.067	-0.171
	[0.121]	[0.163]	[0.175]
Age squared	0.001	0	0.002
	[0.001]	[0.002]	[0.002]
Female	3.724	4.55	4.28
	[0.839]**	[1.144]**	[1.294]**
EAL	-0.329	-0.363	0.874
	[1.326]	[1.606]	[2.108]
SEN	-1.646	-1.647	1.323
	[1.114]	[1.495]	[1.884]
FSM	-0.228	-2.182	-1.707
	[1.110]	[1.429]	[1.939]
EALSENFSM missing	-2.083	-7.871	3.413
	[3.775]	[4.602]	[3.379]
Pre-test	0.159	0.125	0.235
	[0.041]**	[0.049]*	[0.068]**
Pre-test missing	0.225	1.21	-1.757
	[1.673]	[2.282]	[2.426]
Blocking variables	y	y	y
Constant	8.976	14.05	1.284
	[3.150]**	[3.641]**	[3.911]
Log likelihood	-2,167.52	-1,312.26	-779.67
Chi-squared test statistic of RE	27.39	10.9	1.84
Chi-squared p-value	0	0	0.09
N	590	354	222
Random effects			
- school-level variance	19.202	17.821	8.654
	[9.390]	[12.83]	[11.962]
- pupil-level variance	93.461	102.593	82.927
	[5.605]	[7.973]	[8.262]
N schools	28	15	12
N observations per school			
min per school	1	1	1
max per school	52	52	47
mean per school	21	24	19
ICC	0.17	0.148	0.094

Table A12g. PVT measure 2: Information gathering, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	-1.016	-3.197	-1.036
	[2.076]	[2.682]	[1.684]
Age (months)	0.071	0.217	0.149
	[0.116]	[0.168]	[0.171]
Age squared	-0.001	-0.002	-0.001
	[0.001]	[0.002]	[0.002]
Female	0.3	0.117	-0.562
	[0.794]	[1.168]	[1.249]
EAL	1.04	0.815	3.086
	[1.272]	[1.671]	[2.081]
SEN	-0.222	0.079	0.621
	[1.063]	[1.540]	[1.850]
FSM	0.099	0.93	1.168
	[1.070]	[1.505]	[1.902]
EALSENFSM missing	7.616	5.308	-0.4
	[3.526]*	[4.298]	[3.321]
Pre-test	0.152	0.03	0.22
	[0.046]**	[0.063]	[0.085]**
Pre-test missing	2.951	-1.518	2.801
	[1.635]	[2.251]	[2.513]
Blocking variables	y	y	y
Constant	13.409	11.374	11.033
	[2.793]**	[3.374]**	[3.550]**
Log likelihood	-2,144.67	-1,327.25	-776.45
Chi-squared test statistic of RE	22.75	2.7	0.85
Chi-squared p-value	0	0.05	0.18
N	590	354	222
Random effects			
- school-level variance	13.11	8.261	4.071
	[6.683]	[8.761]	[6.999]
- pupil-level variance	86.784	113.54	80.931
	[5.198]	[8.839]	[8.052]
N schools	28	15	12
N observations per school			
min per school	1	1	1
max per school	52	52	47
mean per school	21	24	19
ICC	0.131	0.068	0.048

Table A12h. PVT measure 3: Productive thinking, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	1.711	1.555	3.714
	[1.396]	[1.428]	[1.421]**
Age (months)	-0.106	-0.188	-0.029
	[0.081]	[0.104]	[0.143]
Age squared	0.001	0.002	0
	[0.001]	[0.001]	[0.001]
Female	1.814	1.265	1.893
	[0.556]**	[0.744]	[1.048]
EAL	-1.254	-0.687	-3.197
	[0.883]	[1.037]	[1.709]
SEN	-0.902	-1.307	-2.182
	[0.738]	[0.954]	[1.544]
FSM	-0.661	-0.377	-0.136
	[0.743]	[0.938]	[1.583]
EALSENFSM missing	-1.787	-1.099	1.822
	[2.398]	[2.505]	[2.759]
Pre-test	0.134	0.143	0.33
	[0.029]**	[0.033]**	[0.064]**
Pre-test missing	-2.199	-0.28	1.693
	[1.062]*	[1.285]	[2.001]
Blocking variables	y	y	y
Constant	3.266	3.609	0.986
	[1.913]	[2.033]	[3.504]
Log likelihood	-1,937.13	-1,168.13	-737.06
Chi-squared test statistic of RE	18.16	0.88	4.34
Chi-squared p-value	0	0.17	0.02
N	590	354	222
Random effects			
- school-level variance	5.7	1.607	9.78
	[3.159]	[2.378]	[10.973]
- pupil-level variance	41.96	44.533	54.424
	[2.516]	[3.465]	[5.422]
N schools	28	15	12
N observations per school			
min per school	1	1	1
max per school	52	52	47
mean per school	21	24	19
ICC	0.12	0.035	0.152

Table A12i. PVT measure 4: Metacognitive knowledge, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	0.376	0.89	-0.184
	[0.571]	[0.901]	[0.748]
Age (months)	-0.052	-0.14	-0.021
	[0.040]	[0.064]*	[0.076]
Age squared	0.001	0.001	0
	[0.000]	[0.001]*	[0.001]
Female	0.27	0.545	0.2
	[0.285]	[0.454]	[0.558]
EAL	-0.663	-0.092	-1.603
	[0.449]	[0.641]	[0.925]
SEN	0.502	0.711	-0.51
	[0.376]	[0.591]	[0.822]
FSM	-0.121	0.709	1.106
	[0.379]	[0.581]	[0.843]
EALSENFSM missing	-0.587	0.746	0.36
	[1.103]	[1.558]	[1.482]
Pre-test	0.085	0.091	0.132
	[0.021]**	[0.026]**	[0.066]*
Pre-test missing	-0.522	-0.435	-0.302
	[0.515]	[0.785]	[1.024]
Blocking variables	y	y	y
Constant	-0.056	-0.159	1.202
	[0.848]	[1.269]	[1.500]
Log likelihood	-1,555.91	-1,005.44	-610.46
Chi-squared test statistic of RE	5.85	1.11	0.64
Chi-squared p-value	0.01	0.15	0.21
N	590	354	222
Random effects			
- school-level variance	0.695	0.678	0.773
	[.504]	[.933]	[1.453]
- pupil-level variance	11.152	17.019	15.989
	[.668]	[1.324]	[1.592]
N schools	28	15	12
N observations per school			
min per school	1	1	1
max per school	52	52	47
mean per school	21	24	19
ICC	0.059	0.038	0.046

Table A12j. PVT measure 5: Metacognitive skilfulness, full estimation results

	PETT vs Control	TT vs Control	PETT vs TT
Impact	0.661	-0.062	2.589
	[0.833]	[0.805]	[0.852]**
Age (months)	-0.09	-0.209	0.055
	[0.056]	[0.073]**	[0.086]
Age squared	0.001	0.002	-0.001
	[0.001]	[0.001]**	[0.001]
Female	1.146	0.756	1.381
	[0.389]**	[0.534]	[0.634]*
EAL	-0.921	-0.271	-1.572
	[0.613]	[0.735]	[1.030]
SEN	-0.027	-0.265	-0.108
	[0.513]	[0.678]	[0.920]
FSM	-0.481	-0.85	-0.98
	[0.518]	[0.677]	[0.956]
EALSENFSM missing	-1.298	-2.301	0.616
	[1.561]	[1.599]	[1.656]
Pre-test	0.168	0.133	0.22
	[0.037]**	[0.042]**	[0.065]**
Pre-test missing	-1.808	-0.328	-0.447
	[0.715]*	[0.815]	[1.152]
Blocking variables	y	y	y
Constant	2.444	3.795	0.268
	[1.203]*	[1.363]**	[2.173]
Log likelihood	-1,731.49	-1,057.92	-632.99
Chi-squared test statistic of RE	6.87	0	5.66
Chi-squared p-value	0	0.49	0.01
N	590	354	222
Random effects			
- school-level variance	1.677	0.013	4.179
	[1.164]	[.483]	[4.408]
- pupil-level variance	20.595	23.513	19.688
	[1.236]	[1.82]	[1.961]
N schools	28	15	12
N observations per school			
min per school	1	1	1
max per school	52	52	47
mean per school	21	24	19
ICC	0.075	0.001	0.175

Appendix XIII Subgroup results

Table A13a. Full estimation results – FSM subsample, attainment outcomes

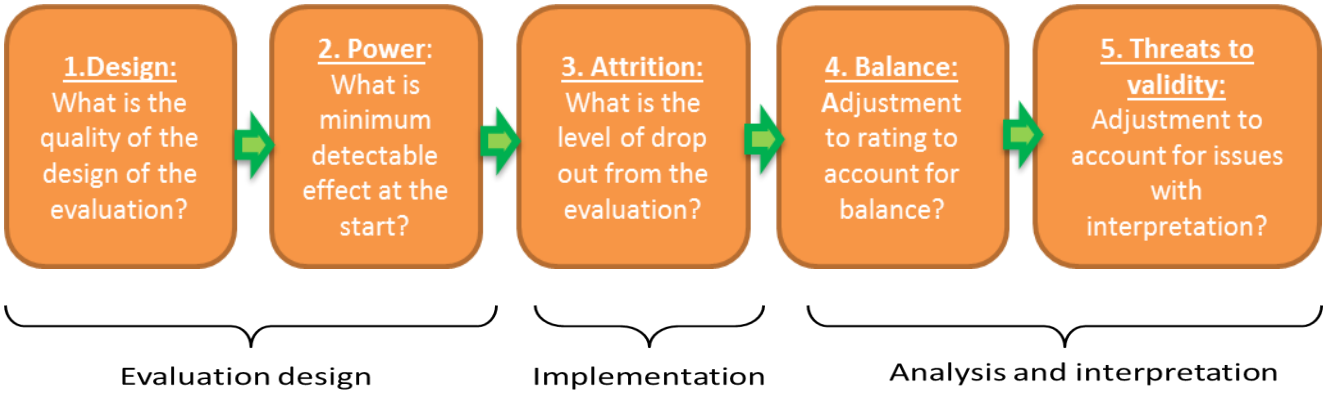
	Literacy & numeracy	Reading	General maths	Mental arithmetic
Impact (PETT vs Control)	-2.821	-1.632	6.682	-0.841
	[5.788]	[8.919]	[3.242]*	[8.597]
Age (months)	7.867	12.27	17.143	17.944
	[13.707]	[17.700]	[9.617]	[20.826]
Age squared	-0.038	-0.06	-0.084	-0.089
	[0.067]	[0.087]	[0.047]	[0.102]
Female	3.172	3.493	-1.913	0.53
	[2.218]	[2.799]	[1.581]	[3.276]
EAL	-0.85	1.267	-1.407	-2.445
	[2.649]	[3.444]	[1.906]	[3.815]
SEN	-11.899	-14.498	-6.087	-14.803
	[2.875]**	[3.619]**	[2.021]**	[4.329]**
Pre-test	0.783	0.687	0.778	0.532
	[0.076]**	[0.075]**	[0.061]**	[0.091]**
Pre-test missing	66.472	104.03	57.84	16.233
	[7.893]**	[28.139]**	[19.894]**	[37.349]
Time between tests		0.192	-0.058	-0.131
		[0.120]	[0.082]	[0.153]
Blocking variables	y	y	y	y
Constant	-374.595	-631.097	-836.161	-812.186
	[697.502]	[903.620]	[489.515]	[1,060.461]
Log likelihood	-434.77	-524.13	-455.37	-538.73
Chi-squared test statistic of RE	2.39	3.17	0	3.49
Chi-squared p-value	0.06	0.04	1	0.03
N	123	136	136	136
Random effects				
- school-level variance	26.887	65.599	0	53.402
	[29.628]	[67.536]	[0]	[51.843]
- pupil-level variance	113.153	212.979	70.846	279.387
	[16.055]	[28.68]	[9.223]	[36.995]
N schools	17	17	17	17
N observations per school				
min per school	1	1	1	1
max per school	17	17	17	17
mean per school	7	8	8	8
ICC	0.192	0.235	0	0.16

Table A13b. Full estimation results – low pre-test subsample, attainment outcomes

	Literacy & numeracy	Reading	General maths	Mental arithmetic
Impact (PETT vs control)	1.099	-0.837	1.999	5.076
	[3.837]	[4.522]	[2.446]	[4.966]
Age (months)	-6.562	-2.533	-9.886	0.041
	[6.279]	[8.224]	[5.286]	[8.454]
Age squared	0.031	0.011	0.049	-0.004
	[0.031]	[0.041]	[0.026]	[0.043]
Female	0.784	3.862	-2.572	-0.827
	[1.823]	[2.357]	[1.602]	[2.986]
EAL	1.441	2.754	-3.236	7.912
	[2.525]	[3.274]	[2.181]	[4.130]
SEN	-3.909	-7.048	-2.287	-7.771
	[2.278]	[2.750]*	[1.872]	[3.586]*
FSM	-3.475	-3.187	-0.537	-9.432
	[2.047]	[2.610]	[1.749]	[3.248]**
EAL SEN FSM missing	1.349	5.862	2.069	10.307
	[6.849]	[8.893]	[4.677]	[10.247]
Pre-test	0.673	0.523	0.69	0.429
	[0.093]**	[0.085]**	[0.081]**	[0.085]**
Time between tests		0.179	0.072	0.103
		[0.099]	[0.057]	[0.110]
Blocking variables	y	y	y	y
Constant	371.108	140.68	517.454	63.658
	[316.622]	[417.167]	[267.090]	[423.148]
Log likelihood	-358.1	-429.74	-387.65	-450.57
Chi-squared test statistic of RE	2.51	1	0.05	0.24
Chi-squared p-value	0.06	0.16	0.41	0.31
N	110	121	120	120
Random effects				
- school-level variance	14.15	14.974	1.514	11.044
	[14.889]	[21.409]	[7.366]	[27.297]
- pupil-level variance	72.892	133.121	62.909	219.61
	[11.072]	[19.127]	[9.139]	[31.726]
N schools	18	19	20	19
N observations per school				
min per school	1	1	1	1
max per school	14	16	14	16
mean per school	6	6	6	6
ICC	0.163	0.101	0.023	0.048

Appendix XIV Security rating

Security rating summary: Mind the Gap



Rating	1. Design	2. Power (MDES)	3. Attrition	4. Balance	5. Threats to validity
5 🔒	Fair and clear experimental design (RCT)	< 0.2	< 10%	Well-balanced on observables	No threats to validity
4 🔒	Fair and clear experimental design (RCT, RDD)	< 0.3	< 20%		
3 🔒	Well-matched comparison (quasi-experiment)	< 0.4	< 30%		
2 🔒	Matched comparison (quasi-experiment)	< 0.5	< 40%		
1 🔒	Comparison group with poor or no matching	< 0.6	< 50%	↓	↓
0 🔒	No comparator	> 0.6	> 50%	Imbalanced on observables	Significant threats

The final security rating for this trial is 1 🔒. This means that findings are of low security.

The trial was designed as a cluster randomised efficacy trial with 51 schools recruited and entered into the randomisation. This resulted in a minimum detectable effect size of just under 0.3 at randomisation for attainment meaning the trial could still have achieved a maximum of 4 🔒. However, there was very high attrition of 57% with only 22 schools entered into the primary analysis. There was some limited evidence of imbalance at the baseline but this was not statistically significant and observable characteristics were controlled for in the analysis. There are some threats to the validity of the results due to there being some evidence of non-compliance to treatment allocation (with control classes implementing the intervention) and tests were delivered by schools.

Appendix XV Cost Rating

Cost ratings are based on the approximate cost per pupil of implementing the intervention over one year. Cost ratings are awarded using the following criteria.

Cost	Description
£	*Very low:* less than £80 per pupil per year.
£ £	*Low:* up to about £170 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.

This document is available for download at **www.educationendowmentfoundation.org.uk**.

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