

Evaluation Summary	
Age range	Primary (Year 4, 5, 6)
Number of pupils	c. 760
Number of schools	c. 32
Design	Randomised controlled trial with class-level randomisation
Primary Outcome	Literacy and Maths

## Evaluation of *SHINE on Manchester Saturday schools*

### Significance

*SHINE* is a fully developed, replicable intervention which is ready for evaluation. The rationale for evaluation is based on limited empirical research demonstrating the promise of the intervention, its wide use in London in schools serving largely disadvantaged populations and its practical significance. An independent evaluation using rigorous design and methods is, therefore, timely. The evaluation focus is on establishing an unbiased estimate of impact of the intervention on short-term academic outcomes (literacy and numeracy) and attitudinal outcomes compared with an untreated control.

The study will include an impact evaluation and a process evaluation.

### Research plan: Impact evaluation

#### **Research questions**

The research question is - what is the impact of *SHINE* on academic attainment outcomes (literacy and maths)? This will be a confirmatory analysis.

A secondary research question is – what is the impact on music outcomes?

#### **Design**

The design is a pragmatic pilot cluster randomised controlled trial, with random allocation at the level of the school. Three ‘hub’ schools will be recruited. These schools will ‘host’ the delivery of the intervention to children identified from the hub schools and at least nine ‘partner’ schools. Each partner school will link with a hub school. Each school will identify up to 20 children eligible to be offered the intervention in two year groups (years 5 and 6 or years 4 and 5). At each school one of the year groups will be randomly allocated to intervention and the other year group will serve as a control. In this way there will be an intervention group and a control group in each school. In the first year of the evaluation we will run a pilot trial in at least 12 schools and in the second year of the evaluation we will run a full trial in a further 20 schools.

A pragmatic randomised trial is the most rigorous evaluative design. It avoids selection bias, because random allocation determines which groups are in the intervention group and which groups are in the control group. The trial will be designed, conducted and reported to CONSORT standards (Altman et al, 2011) in order to minimise all potential threats to internal validity, such as selection bias and a range of post randomisation biases (Cook and Campbell, 1969; Shadish, Cook and Campbell, 2002; Torgerson and Torgerson, 2008). In this way unbiased estimates of impact of the intervention will be provided.

Following an information meeting on September 10<sup>th</sup> 2012 schools will be consented and enrolled into the trial. In September/October the children will be given pre-tests (literacy, maths and developed ability). After completion of all pre-testing the year groups in each school will be randomised. This will prevent knowledge of the intervention either affecting the pre-test results or changing the pattern of recruitment into the trial. Once the pre-test data have been collected the classes will be allocated using stratification and blocking or minimisation. Stratification will be by type of school ('hub' or 'partner'). Concealed allocation will be undertaken by a statistician who is independent of the intervention development and implementation.

#### ***Pilot trial 2012-13***

The proposed pilot sample will comprise at least 12 schools (3 'hub' schools and at least 9 partner schools) and up to 20 Year 5 and Year 6 children and their teachers in these schools. The results will be generalisable to these schools. Some limited generalisability to schools in the UK with similar characteristics will be possible.

#### ***Main trial 2013-14***

The proposed main trial sample for this year will comprise the schools in the pilot trial (see above) and up to 20 Year 4 and Year 5 children and their teachers in these schools, and an additional at least 20 schools and up to 20 Year 5 and Year 6 children and their teachers in these schools.

#### ***Main trial 2014-15***

The proposed main trial sample for this year will comprise the 20 2013-4 schools (in Manchester) and up to 20 Year 4 and Year 5 children and their teachers in these schools.

#### ***Outcome Measures***

The standardised tests from the CEM InCAS system will be used to measure changes in attainment (literacy and maths). Literacy has four components: word recognition, word decoding, comprehension and spelling; maths has two components: general mathematics and mental arithmetic. The primary outcome will be literacy. The tests will be carried out before and after the delivery of the intervention in all schools in all years of the trial. Whilst the testers will not be blinded, the nature of computer adaptive tests in which each child does the test with no human help provided limits the potential for a source of bias to be introduced. [For the very few children who might need help, specific testing protocols will be provided to the schools.] All of the children in each year will be included in the pre- and post-tests and this useful information will be provided to the schools / teachers.

Estimating the impact of *SHINE* on academic attainment outcomes (literacy and maths) and attitudes will be possible in this evaluation as confirmatory analyses.

Music outcomes will be developed for the post-test period with input from HALLE SHINE and our Research Advisory Group.

The baseline assessment for the pilot study will be administered in September/October 2012 and the post-intervention assessment will be administered in July 2013.

### ***Sample size calculations***

The sample sizes for all of the trials make the following assumptions. First, we assume there will be approximately 10 children per year group in each school taking part in the trial. Second, using data from the Every Child Counts evaluation (Torgerson et al, 2011) we estimate an intra-cluster correlation coefficient of 0.19 (which is based on a numeracy outcome) and the pre- post-test correlation of the PIM 6 is 0.74. Using the formula  $1 + ((\text{class size} - 1) \times \text{intra-cluster correlation})$  gives us a design effect of 2.71.

We estimate that we will have at least 120, 320 and 200 pupils in the pilot, main (2012-14) and main trial (2014-2015) respectively giving 640 participants in total. However, we have a high pre- post-test correlation but also significant clustering. Pre- post test correlation will inflate the effective sample size to: 260 (i.e., 120 inflated), 694 (ie., 320 inflated) and 434 (i.e., 200 inflated) giving 1388 in total. However, these now need to be adjusted downwards by dividing them by the design effect of 2.71. Consequently we get: effective sample sizes, adjusting for both clustering and pre- post- test correlation of: 96; 266, 160 for each study respectively and 522 in total. This will give us 80% power to detect differences of: 0.58; 0.35 and 0.45 respectively with a difference of 0.25 when all the groups are pooled.

### ***Primary analysis***

Our analysis strategy will use intention to treat. All selected children within the schools that are randomised will be included in the analysis. Even if a school withdraws from the intervention all the data on the children participating in the study will be collected if possible and included in the analyses. The mean X score will be compared between treatment and control groups using a marginal general linear model (GLM) with robust standard errors and an exchangeable correlation. The marginal model will use Generalised Estimating Equations (GEEs) to estimate the regression coefficients. A 95% confidence interval for the difference in X scores between the intervention and control group will also be reported with its associated p-value. Pre-test scores will be included in the analyses, as well as the cluster level covariates (e.g., school size) and the stratification or minimisation factor type of school, which will increase the precision of estimates. This analysis will take into account the clustered nature of the data with children nested within class. This analysis approach is a general version of the Huber White method and produces a similar result to other methods, such as multi-level models or linear mixed models that adjust for clustering. We will adjust the analyses for: FSM status, deprivation index (IDACI), gender, English as an additional language, and prior attainment (KS1).

### **Research plan: Process evaluation**

The process evaluation elements will focus on the potential enhancements to the existing SHINE on Saturday programme which is running across about 70 schools in London with particular reference to the link up and work with the Hallé Orchestra. We will use the existing data and on-going evaluations from the London Programme as a reference point.

This approach builds on existing knowledge about the programme, rather than evaluating it from first principals.

### ***Research questions***

The primary research question is - what is the impact of SHINE on attitudinal outcomes? .

The secondary research question is - what are the management and organisational issues associated with implementing the intervention?

### ***Design***

The design is cross-sectional.

In order to assess the impact of SHINE on attitudinal outcomes (perceived impacts on the pupils, in terms of supporting learning outcomes and social, behavioural and attitudinal / aspirational outcomes) analyses of the InCAS attitudes responses will be combined with questionnaire surveys to all children during site visits to hub and partner schools. Small group interviews with a random sample of pupils will be used to further explore the issues raised in the questionnaire responses. Interviews with a random sample of teachers and teaching assistants will be carried out to augment and triangulate the findings.

In order to assess the management and organisational issues, face to face and telephone interviews will be carried out with a random sample of key stakeholders. This will include the programme managers, participating schools heads, those responsible for delivering the music component, Local Authority representatives, SHINE and Hallé representatives and management. This element will focus on how the programme could be expanded in Greater Manchester and beyond.

A series of case studies of a random sample of individual schools will be undertaken. These will concentrate on the individual schools perspective and bring together analysis of organisational factors and individual pupil level experiences and impact. The case studies will include an assessment of how the programme could be rolled out.

### ***Personnel***

Professor Carole Torgerson (PI and methodologist), Dr Andy Wiggins (project management), Victoria Menzies (project researcher / data manager), Kirsty Younger (research support), Dr Adetayo Kasim (statistician), Dr Catherine Hewitt (senior statistician).

### ***Roles and responsibilities***

CT (PI) – Design of trial (write and register protocol); oversee all stages in the conduct, analysis and reporting of trial, including recruitment and retention of schools, report-writing; supervise work of trial co-ordinators, statistician and data managers on the trial.

VM – trial co-ordination and data management, contribution to the analysis and write up.

KY - trial administration and trial co-ordination assistance.

AW– project management support and co-ordination of Durham team; co-ordinate baseline and outcome assessments

AK – trial statistician - write data analytic plan; undertake independent, concealed random allocation using stratification or minimisation; undertake statistical analyses

CH – experienced education trials statistician – oversee trial statistician’s plan and analyses

## **Roles of the partner organisations**

### ***Roles of SHINE/ Hallé orchestra***

- Write detailed description of the intervention
- Work with evaluation team to recruit schools, parents and children and obtain the necessary consents (consent will be by parental opt-in for the intervention and parental opt-out for data to be used in the evaluation), using information sheets and consent forms written by the evaluators
- Liaise with trial co-ordinators on all aspects of conduct of trial
- Liaise with head teachers on recruitment, consent and training
- Provide ongoing support to teachers

### ***Role of EEF***

- Project overview

### ***Durham University Peer Review Group***

Professor Joe Elliott

Professor Steve Higgins

Dmitra Kokotsaki

Dr Christine Merrill

The Peer Review Group will meet twice each year and provide advice on any aspect of the design, conduct and reporting of the evaluation.

## **Data protection statement**

Durham University's data protection policy is publically available at:

<http://www.dur.ac.uk/resources/data.protection/dataprotectionpolicy.pdf>

“Durham University is committed to protecting the rights and freedoms of individuals in accordance with the provisions of the Data Protection Act 1998. The requirements to which University staff and student who process personal data must adhere are set out in the University's Data Protection Policy”

## **Proposed timeline for pilot phase**

**July/Aug 2012:** finalise design and write and register Protocol; discussion with partner organisations

**Aug/Sept 2012:** Recruit and consent schools and pupils. Recruitment conference run by evaluation team and SHINE/ Hallé (Sept. 10<sup>th</sup>)

**September/Oct 2012:** Group pre-testing

**September/Oct 2012:** Random allocation of classes

**October/Nov 2012-May/June 2013:** Implementation of intervention and comparison programmes

**June/July 2013:** Post-testing (all schools)

**July/Aug 2013:** Analysis and interim results to EEF

**August 2013:** Report writing

**September 2013:** Interim report to EEF

## References

- Altman, D.G., Schulz, K.F., Moher, D., Egger, M., Davidoff, F., Elbourne, D., Gotzsche, P.C. and Lang, T. (2001) 'The revised CONSORT statement for reporting randomized trials: Explanation and elaboration' *Annals of Internal Medicine* 134 (8): 663-694.
- Cook, T.D. and Campbell, D.T. (1979) *Quasi-Experimentation: Design and Analysis Issues for Field Settings*, Boston: Houghton Mifflin Company.
- Shadish, W.R., Cook, T.D. and Campbell, D.T. (2002) *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*, Boston: Houghton Mifflin Company.
- Torgerson, D. and Torgerson, C. (2008). *Designing and running randomised trials in health, education and the social sciences*. London: Palgrave Macmillan,

## Risks

Low risks associated with this project include operational and project specific risks. For the operational risks such as staffing and IT / assessment system we are confident that we have systems and procedures in place to minimise any risks, but would nonetheless be very happy to provide further details.

**School and pupil recruitment** – whilst this will be the primary responsibility of the programme developers, Durham university and the project team have a good track of recruiting schools, and will help with this if necessary. The use (free) of the InCAS indicators will be an additional incentive for most schools to take part.

**Attrition and loss to follow up** – in a study such as this it is essential that this is kept to a minimum. Whilst this will be the primary responsibility of the implementation team, our involvement, as with the recruitment, will help to minimise attrition.

**Maintaining fidelity (intervention and control)** - it is essential that as many as possible schools maintain a high level of implementation fidelity. Again whilst the primary responsibility will lie with the implementation team we will provide some support, for example, by emphasising the importance of contributing to the process of building good evidence.

## **List of appendices**

- Appendix A: Evaluation information sheet for schools (expression of interest)
- Appendix B: Evaluation information sheet for schools (recruitment meeting)
- Appendix C: School consent form
- Appendix D: Two-page research proposal
- Appendix E: Flow of actions sheets for pilot and main trials
- Appendix F: Parent information/opt-out letter
- Appendix G: Analysis plan

## **APPENDIX A: Evaluation information sheet (expression of interest)**

### **SHINE on Manchester with the HALLE Orchestra**

#### **Evaluation information sheet: School expression of interest in the project**

##### **2012-13: Pilot Trial**

The Education Endowment Foundation has asked researchers at Durham University to evaluate SHINE on Manchester with the HALLE Orchestra Education Outreach Department, to find out how well SHINE works in improving outcomes for the children who take part. The researchers at Durham University will not change how SHINE is delivered in Manchester. They have designed a study that will measure improvements in literacy, numeracy, aspirations and music outcomes/attitudes for the children who take part and will compare these with the same outcomes for children who have not taken part. All recruited schools will take part in SHINE, some with Year 5 children and some with Year 6 children.

**In June 2012 SHINE will have preliminary discussions with schools to establish interest in the project and willingness to be approached in July to be recruited and consented following ethical approval of the evaluation design Protocol.**

In June/July/Aug./Sept. 2012 3 hub and 9 partner schools (12 schools altogether) will be recruited to SHINE on Manchester and to the evaluation. The hub schools will receive the award of a grant to deliver SHINE to children from the hub school and 3 partner schools. The process for recruitment to SHINE/evaluation for all schools will involve signing a memorandum of understanding with the evaluation team to:

- agree to identify up to 20 children in both Year 5 and Year 6 using a consistent approach;
- agree to random allocation of ONE of these year groups to SHINE (and the other group will be a control group);
- agree to baseline testing to be arranged and undertaken by the evaluators with all Year 5 and all Year 6 children; and
- agree to outcome tests to be arranged and undertaken by the evaluators with all Year 5 and all Year 6 children.

All recruited schools will be able to offer SHINE on Manchester to *up to 20 children* in Year 5 or *up to 20 children* in Year 6.

In Sept. 2012 there will be an information meeting for 12 schools which have been recruited. At this meeting the evaluation design and the study procedures will be explained in detail, and there will be an opportunity to ask questions. Following this meeting each school will identify up to 20 children in Year 5 and up to 20 children in Year 6 and will give this information to the Durham researchers. Durham University will arrange for baseline



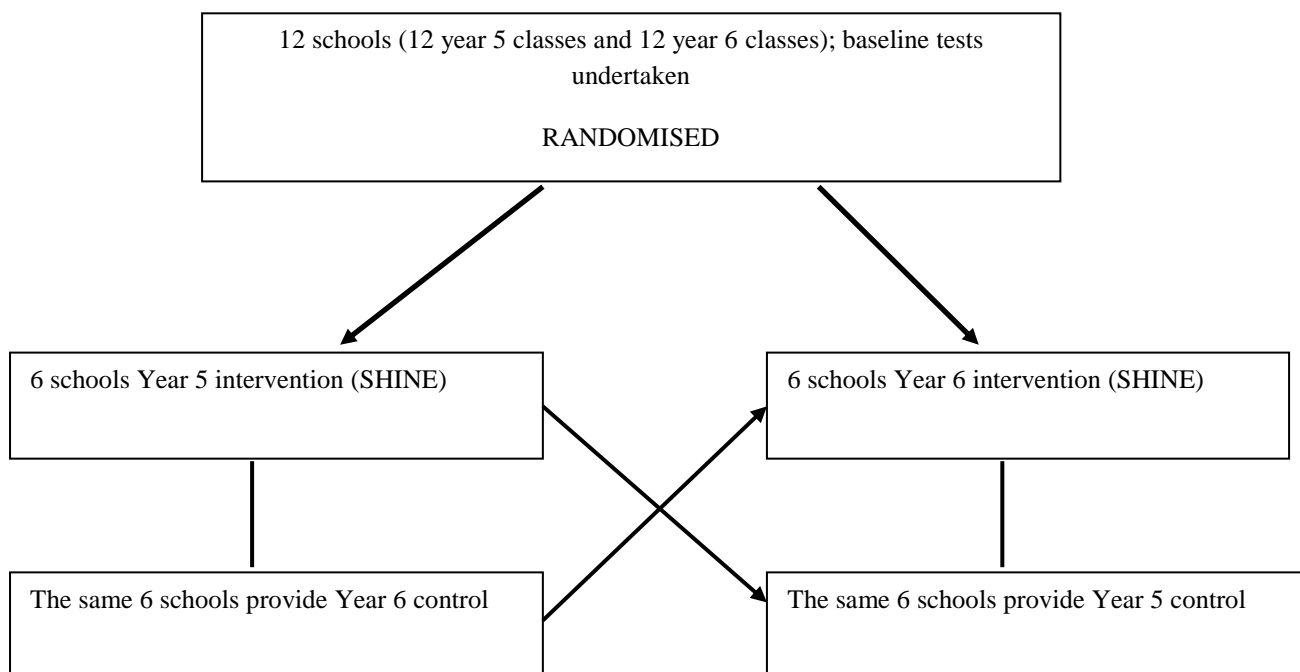
tests to be undertaken with all children in Years 5 and 6. These will probably be the Curriculum Evaluation and Monitoring (CEM) Centre InCAS system which will assess literacy and numeracy and these data will be fed back to schools. 12 schools will then be *randomly allocated* (like in a lottery) half to offering SHINE to Yr 5 children (6 schools) and half to offering SHINE to Yr 6 children (6 schools). The Durham researchers will inform the schools which year in each school will be offered the intervention. Only intervention children and parents will be informed (not control children). Consent will be by opt-in for the intervention children only. All children will be anonymised for the research as we will only collect UPN numbers.

Oct. 2012- June 2013 – SHINE on Manchester will go ahead with no interference from the Durham researchers, although they will come and observe some of the activities.

In July 2013 outcome tests (literacy, numeracy, aspirations, music outcomes/attitudes) will be undertaken with all Yr 5 and Yr 6 children.

**Design**

The randomised comparison (which tells us how well SHINE works) is the average outcomes for the children in Yr 5 ‘intervention’ schools compared with average outcomes for children in Yr 5 ‘control’ schools AND the average outcomes for the children in Yr 6 ‘intervention’ schools compared with the average outcomes for the children in the Yr 6 ‘control’ schools.



**The diagonal arrows indicate the randomised comparisons.**

Yr 5 schools in the pilot trial will continue with the intervention and control conditions in Yr 6 in 2013-14 to provide one-year follow-up data.

***Pilot trial schools could then run the intervention for Yr 4 and Yr 5 children in 2013-14 and 2014-15, using the same design as above, and these data could be added to the data from 2012-13 in a meta-analysis, i.e. where the data from each year are combined.***

### **2013-14: Main Trial**

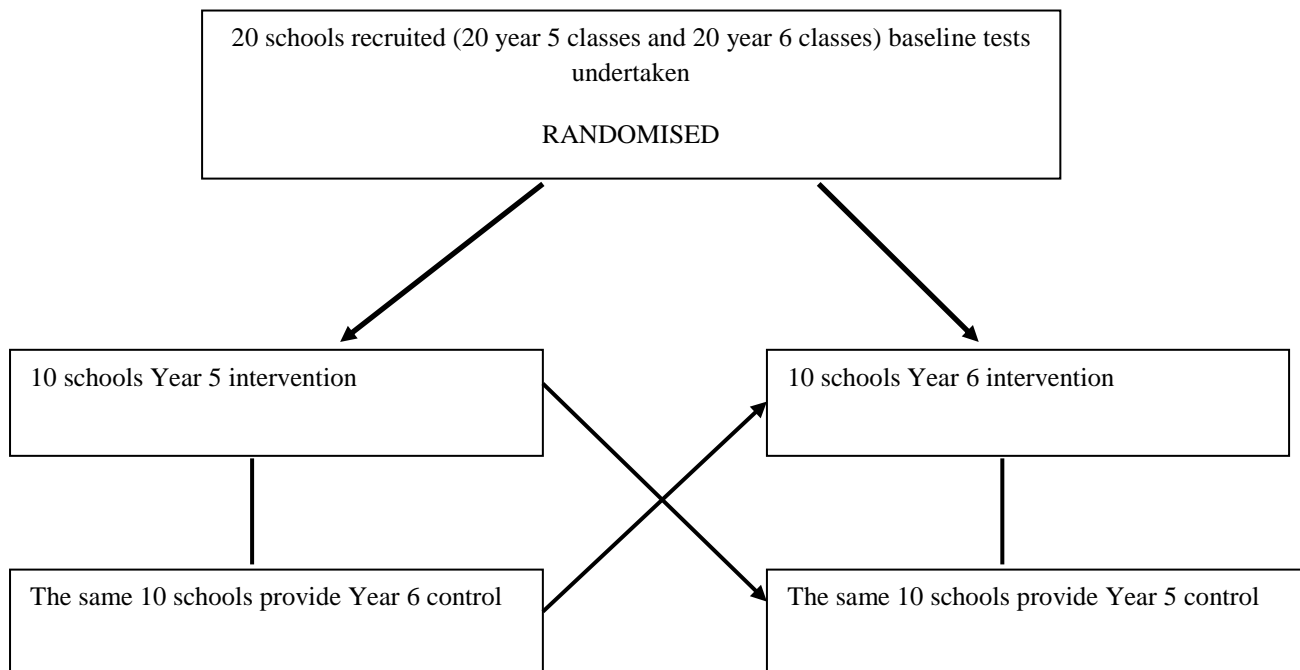
June/ July 2013: 5 hub and 15 partner schools recruited (20 schools), with up to 20 pupils identified in Yr 5 and up to 20 pupils identified in Yr 6 in each school.

Sept. 2013 – information meeting for 20 schools; baseline tests; schools randomly allocated half to implementation of intervention in Yr 5 (10 schools) and half to implementation of intervention in Yr 6 (10 schools).

Oct. 2013- June 2014 - implementation of intervention (SHINE)

July 2014 outcome tests (literacy, numeracy, attitudes, music) for Yr 5 and Yr 6 children.

Randomised comparison: Yr 5 ‘intervention’ schools compared with Yr 5 ‘control’ schools AND Yr 6 ‘intervention’ schools compared with Yr 6 ‘control’ schools.



**The diagonal arrows indicate the randomised comparisons.**

***Yr 5 schools in the main trial will continue with the intervention and control condition in 2014-15 to provide follow-up data.***

***Main trial schools could then run the intervention for Yr 4 and Yr 5 children in 2014-15, using the same design and these data could be added to the data from 2013-14 year in a meta-analysis.***

Carole Torgerson, PI SHINE evaluation

1<sup>st</sup> June, 2012

## **APPENDIX B: Evaluation information sheet (recruitment meeting)**

### **SHINE on Manchester with the HALLÉ Orchestra**

#### **Evaluation information sheet**

**[Note: this information sheet will be used at the school recruitment meeting, September 10<sup>th</sup> 2012]**

#### **Hallé SHINE on Manchester**

#### **Evaluation information sheet**

The Education Endowment Foundation has asked researchers at Durham University to evaluate Hallé SHINE on Manchester, to find out how well SHINE works in improving outcomes for the children who take part. The researchers at Durham University will not change how SHINE is delivered in Manchester. They have designed a study that will measure improvements in literacy, numeracy and attitudes for the children who take part and will compare these with the same outcomes for children who have not taken part. All recruited schools will take part in SHINE, some with Year 5 children and some with Year 6 children.

#### **2012-13: Pilot Trial**

By September 2012 three hub and at least 9 partner schools will be recruited to Hallé SHINE on Manchester and to the evaluation. The hub schools will receive the award of a grant to deliver SHINE to children from the hub school and their partner schools. The schools taking part in the first year of the evaluation will be part of the 'pilot trial'.

The process for recruitment to SHINE/evaluation for all schools will involve signing a memorandum of understanding with the evaluation team to:

- agree to identify up to 20 children in both Year 5 and Year 6 using a consistent approach;
- agree to random allocation of ONE of these year groups to SHINE (and the other group will be a control group);
- agree to baseline testing using computer-based assessment provided by the evaluators with all Year 5 and all Year 6 children; and
- agree to outcome testing using computer-based assessment provided by the evaluators with all Year 5 and all Year 6 children.

All recruited schools will be able to offer Hallé SHINE on Manchester to *up to 20* children in Year 5 **or** *up to 20* children in Year 6.

At the September information/recruitment meeting the evaluation design and the study procedures will be explained in detail, and there will be an opportunity to ask questions. Following this meeting each school will identify up to 20 children in Year 5 and up to 20 children in Year 6 and will give this information to the Durham researchers.

Durham University will provide schools with the necessary software, information and support to administer the InCAS assessment. InCAS is a computer-based assessment provided by the Centre for Evaluation and Monitoring (CEM). It includes modules on numeracy, literacy, developed ability and attitudes. Schools will complete the assessment with all children in Year 5 and Year 6 and return the data to CEM. Schools can then download the assessment results for their own use.

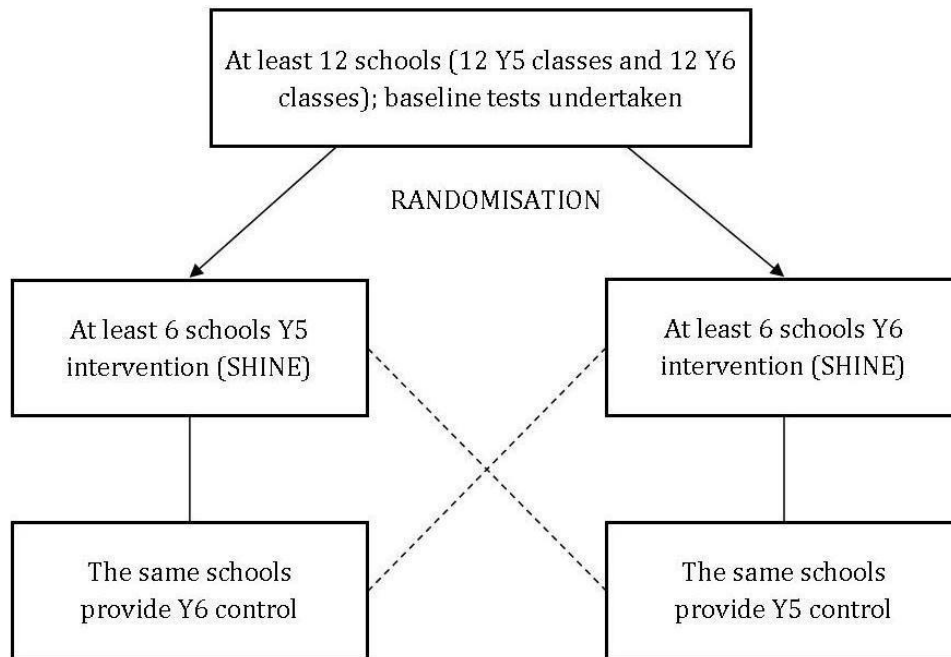
Schools will then be *randomly allocated* (like in a lottery) half to offering SHINE to Year 5 children and half to offering SHINE to Year 6 children. The Durham researchers will inform SHINE of the allocation and SHINE will inform each school which year group will be offered the intervention. Only intervention children and parents will be informed (not control children). Consent will be by opt-in for the intervention children and opt-out (for data use) for the control children. All pupil data will be analysed anonymously and will be kept completely confidential.

Oct. 2012 - June 2013 – Hallé SHINE on Manchester will go ahead with no interference from the Durham researchers, although they will come and observe some of the activities.

In July 2013 outcome testing (InCAS assessment) will be undertaken by schools with support from Durham University as before, with all Year 5 and Year 6 children.

## **Design**

To learn about how well SHINE works we will compare children in both year groups. We will compare the average outcomes of Year 5 children who have received the intervention with the average outcomes of those in the Year 5 control classes. We will also compare the outcomes for Year 6 intervention children with those in the Year 6 control classes.



Year 5 schools in the pilot trial will continue with the intervention and control conditions in Year 6 in 2013-14 to provide one-year follow-up data.

Pilot trial schools will then run the intervention for Year 4 or Year 5 children in 2013-14 using the same design as above. The data from this year will be added to the data from 2012-13 in a meta-analysis, where the data from each year are combined to give more reliable results.

### **2013-14: Main Trial**

In September 2013 at least 20 further schools will join the trial: 5 hub schools and at least 15 partner schools. These schools will take part in the assessment, randomisation and intervention in just the same way as the pilot trial (which will mean that ultimately, we can look at all the data together for greater certainty about the outcome).

Schools in the pilot trial will end their participation in the evaluation after 2013-14; schools in the main trial will continue for a second year in the same way as the pilot trial schools, ending their participation in the evaluation after 2014-15.

### **Contact Details**

Schools are welcome to contact the Durham University team for more information about the evaluation and assessment:

**Professor Carole Torgerson**, Durham University, Principal Investigator, Independent SHINE evaluation

Contact: [carole.torgerson@durham.ac.uk](mailto:carole.torgerson@durham.ac.uk); School of Education, Durham University, Leazes Road, Durham, DH1 1TA. Tel.: 0191 334 8382

**Victoria Menzies**, Trial Coordinator

Contact: [victoria.menzies@cem.dur.ac.uk](mailto:victoria.menzies@cem.dur.ac.uk), CEM, Mountjoy Research Centre, Durham University, Stockton Road, Durham, DH1 3UZ. Tel.: 0191 334 4177

**Kirsty Younger**, Trial Administrator

Contact: [kirsty.younger@cem.dur.ac.uk](mailto:kirsty.younger@cem.dur.ac.uk), CEM, as above. Tel.: 0191 334 4176

## APPENDIX C

### Independent Evaluation of SHINE on Manchester Saturday Schools

#### School consent form

- I confirm that I have read and understood the information sheet for the above evaluation and have had the opportunity to ask questions;
- I understand that all children's results will be kept confidential and that no material which could identify individual children or the school will be used in any reports of this evaluation;
- I agree to identify up to 20 children in both Year 5 and Year 6 to be eligible to be offered the SHINE intervention;
- I agree to random allocation of ONE of these year groups to be offered the SHINE intervention (and the other group to be a control group);
- I agree to baseline and outcome testing using computer based assessment provided by the evaluators with ALL Year 5 and all Year 6 children. Opt-out for individual children's data to be used in the evaluation will be offered to all parents.
- I consent to the school taking part in the above study.

Name of headteacher .....

School .....

Tel no .....

Email address .....

Signature of headteacher.....

Date.....

Thank you for agreeing to take part in this research. Please return this consent form at the information meeting or afterwards by post to:

Kirsty Younger, Trial Administrator  
CEM, Rowan House, Mountjoy Research Centre, Durham University, Stockton Road, Durham  
DH1 3UZ



## APPENDIX D

### **Research proposal to Education Endowment Foundation to evaluate *SHINE on Manchester Saturday schools***

#### **Significance**

*SHINE* is a fully developed, replicable intervention which is ready for evaluation. The rationale for evaluation is based on limited empirical research demonstrating the promise of the intervention, its wide use in London in schools serving largely disadvantaged populations and its practical significance. An independent evaluation using rigorous design and methods is, therefore, timely. The evaluation focus is on establishing an unbiased estimate of impact of the intervention on short-term academic outcomes (literacy and numeracy) and attitudinal outcomes compared with an untreated control. The study will include an impact evaluation and a process evaluation.

#### **Research Plan: Impact evaluation**

##### ***Research Questions***

- The primary research question will be – what is the impact of *SHINE* on academic attainment outcomes (literacy, maths and developed ability)? These will be confirmatory analyses.
- The secondary research question will be – are improvements in attainment moderated by FSM status, deprivation index (IDACI), gender, English as an additional language, and prior attainment (KS1)? These will be exploratory analyses.

##### ***Design***

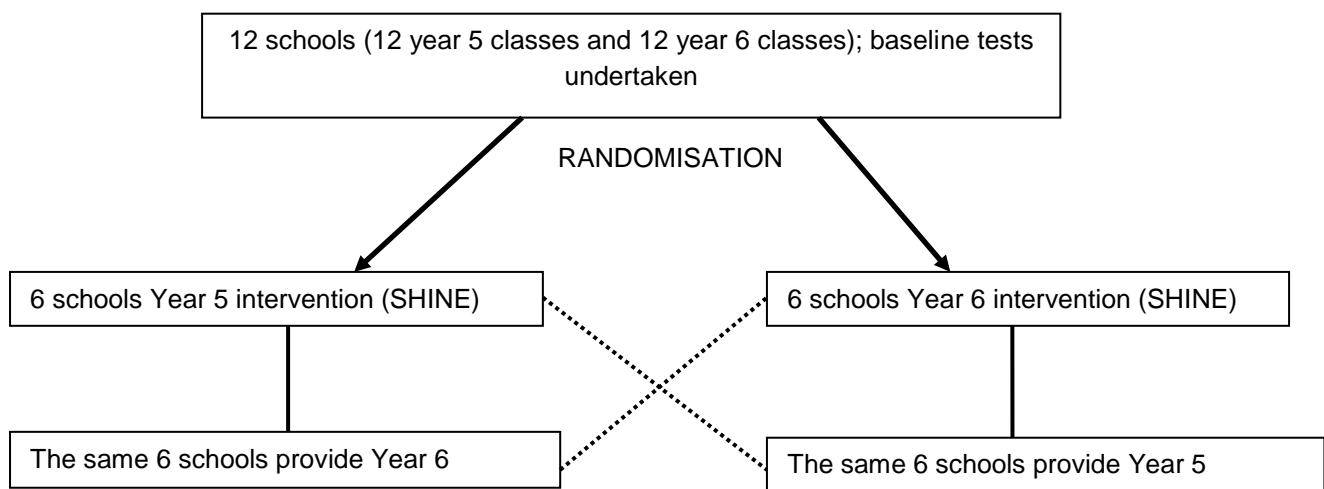
The design is a pragmatic pilot cluster randomised controlled trial, with random allocation at the level of the school. Each school will identify up to 20 children eligible to be offered the intervention in two years (years 5 and 6 or years 4 and 5). At each school one of the year groups will be randomly allocated to intervention and the other year group will serve as a control. In this way there will an intervention group and a control group in each school.

In the pilot year 2012-13 the proposed sample will comprise at least 12 schools (3 'hub' schools and at least 9 partner schools) and up to 20 Year 5 and Year 6 children and their teachers in these schools. The main trial 2013-14 will include Year 4 and Year 5 children from these initial pilot schools, and Year 5 and Year 6 children from an additional 20 schools (5 'hub' schools and at least 15 partner schools). The main trial 2014-15 will include Year 4 and Year 5 children from the 20 main trial schools.

Following information meetings in September 2012 and 2013 schools will be consented and enrolled into the trial. In September/October each year the children will be given pre-tests. The standardised tests from the CEM InCAS system will be used to measure changes in attainment (literacy, maths and developed ability). After completion of all pre-test the year groups in each school will be randomised.

Following the delivery of the intervention by SHINE and the Hallé Orchestra, all children in intervention and control classes will complete the InCAS assessment again in July 2013. This pattern of pre- and post-test will be repeated in each year of the trial. Our analysis strategy will use intention to treat.

**Randomisation (pilot year)**



The randomisation will be completed in the same way in each year of the trial.

**Research plan: Process evaluation**

The process evaluation elements will focus on the potential enhancements to the existing SHINE on Saturday programme which is running across about 70 schools in London with particular reference to the link up and work with the Hallé Orchestra.

**Research Questions**

- The primary research question will be – what is the impact of SHINE on attitudinal outcomes?
- The secondary research questions will be – what are the management and organisational issues associated with implementing the intervention?

**Design**

The design is cross-sectional. In order to assess the impact of SHINE on attitudinal outcomes (perceived impacts on the pupils, in terms of supporting learning outcomes and

social, behavioural and attitudinal / aspirational outcomes) analyses of the InCAS responses will be combined with questionnaire surveys to all children during site. Small group interviews with a random sample of pupils, teachers and teaching assistants and face to face and telephone interviews with a random sample of key stakeholders will also be carried out.

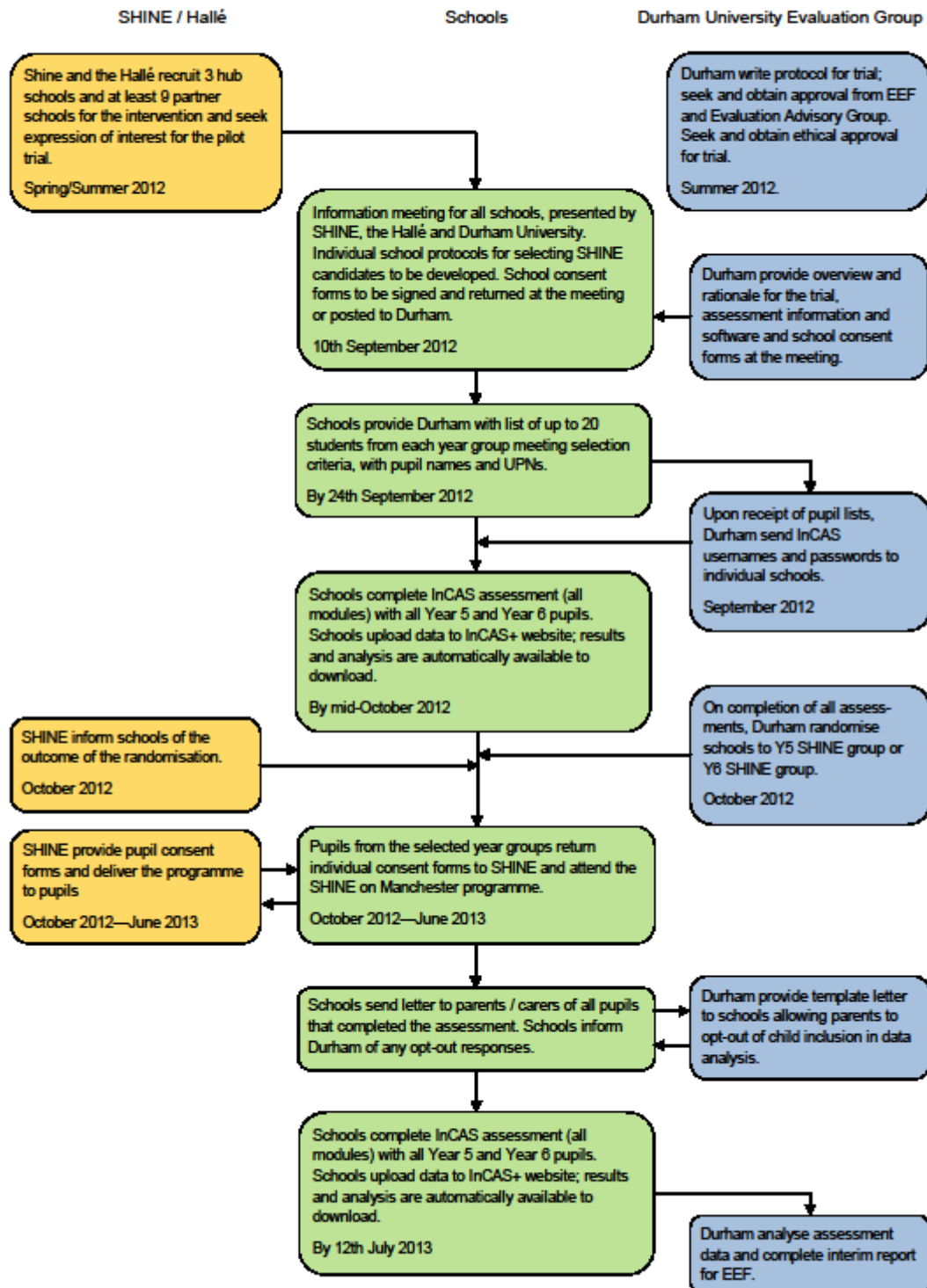
A series of case studies of a random sample of individual schools will be undertaken, analysing organisational factors and pupil-level experience and assessing how the programme could be rolled out.

### **Personnel**

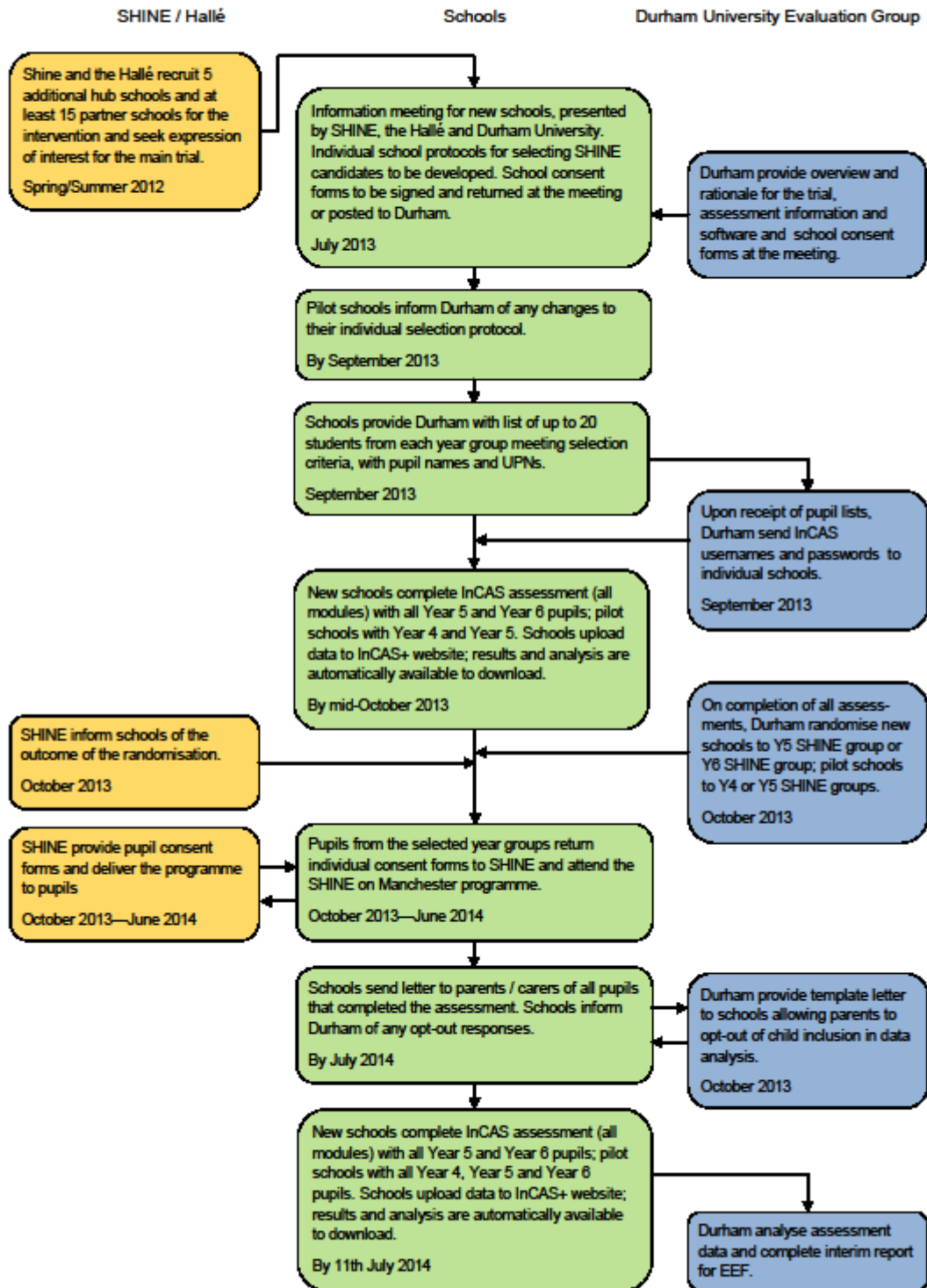
Professor Carole Torgerson (PI and methodologist), Dr Andy Wiggins (project management), Victoria Menzies (project researcher / data manager), Kirsty Younger (research support), Dr Adetayo Kasim (statistician), Dr Catherine Hewitt (statistician).

## Appendix E: Flow of actions for pilot and main trials

### SHINE Evaluation Flow of Actions: Pilot Year



## SHINE Evaluation Flow of Actions: Main Trial Year

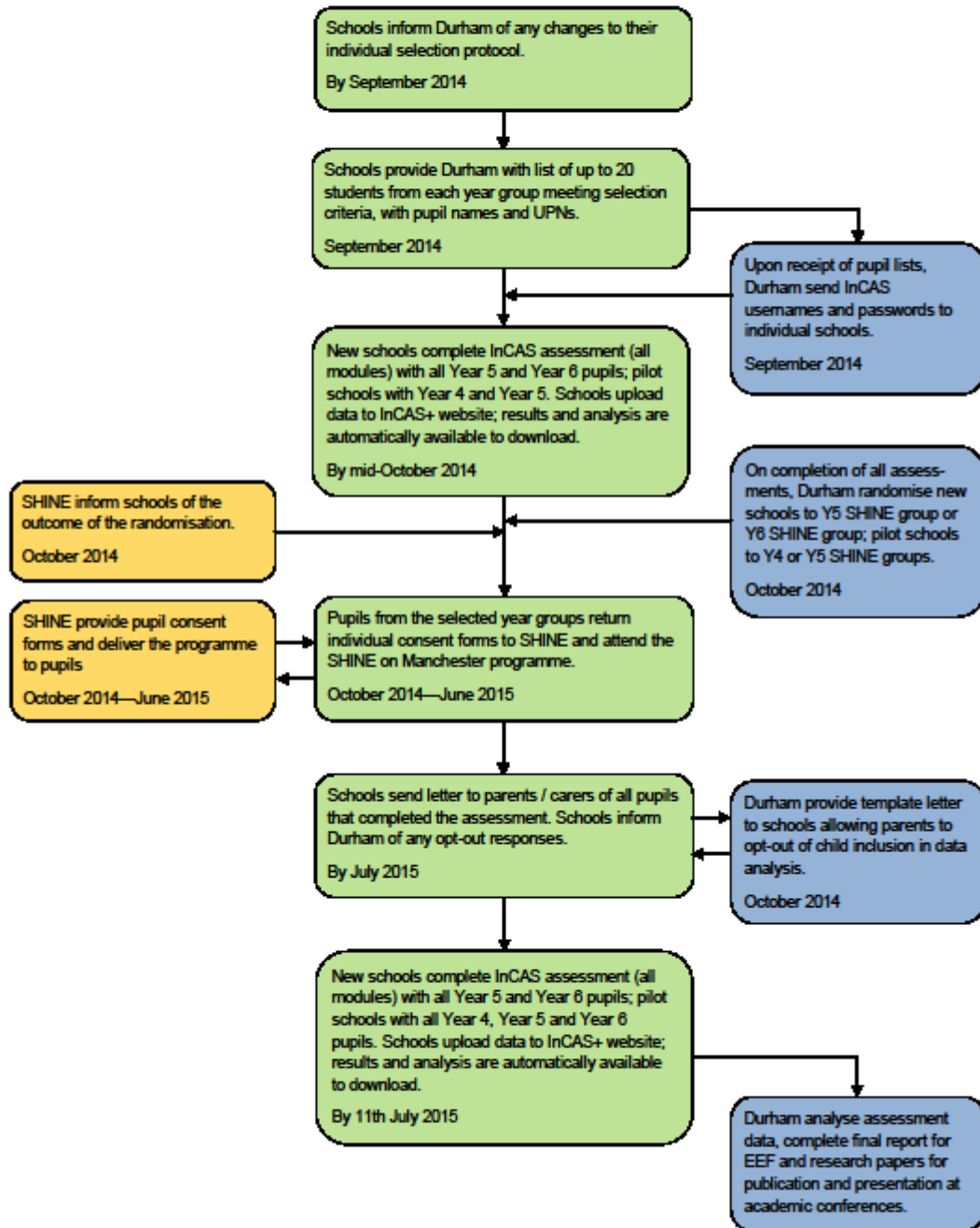


## SHINE Evaluation Flow of Actions: Final Year

SHINE / Hallé

Schools

Durham University Evaluation Group



## Appendix F: Parent information/opt-out letter



School of Education  
Durham University  
Leazes Road  
Durham  
DH1 1TA

<insert date>

<insert school name>

Hallé SHINE on Manchester Evaluation by Durham University

Dear Parent / Carer

Some pupils from your child's school will be taking part in the SHINE on Manchester Saturday school programme with the Hallé Orchestra over the coming year. We will be collecting data using the InCAS (Interactive Computerised Assessment System) assessments, which are used by many schools across the UK. These data will be passed on to your child's school to help improve teaching and learning, and also used by the research team at Durham to see what difference the SHINE programme made. Your child's data will not be passed on to anyone else and will be kept confidential at all times. However if you would rather we did not use your child's data for this project please complete the attached 'opt-out' form.

If you would like further information about our evaluation of SHINE or the InCAS assessments please contact the lead researcher, Professor Carole Torgerson. In the first instance please make contact, through Kirsty Younger the Trial Administrator: [kirsty.younger@cem.dur.ac.uk](mailto:kirsty.younger@cem.dur.ac.uk); 0191 334 4176.

Yours faithfully,

Carole Torgerson

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I do not want my child's InCAS data to be used by Durham University for the Hallé SHINE on Manchester evaluation.

Signed .....

Child's name .....

Date .....

## **Appendix G: Analysis plan**

### **1. Trial objectives**

#### **Primary objective**

To compare performance in literacy (reading) between children who are allocated to take part in SHINE and those who are not allocated to take part in SHINE.

#### **Secondary objective**

To compare performance in literacy (spelling) and mathematics (general mathematics and mental arithmetic) between children who are allocated to take part in SHINE and those who are not allocated to take part in SHINE.

### **2. Sample size**

The sample size calculation assumes there will be approximately 10 children per year group in each school taking part in the trial with an estimated intra-cluster correlation coefficient of 0.19 (which is based on a numeracy outcome) and the pre- post-test correlation of 0.74. At 5% significance level, 96 children are required to detect a difference of 0.58 with 80% power for the pilot trial. However, there are 170 children from 17 schools (3 hubs and 14 partner schools) recruited for the pilot trial.

### **3. Randomisation**

The seventeen schools recruited for the pilot trial will be stratified by school type into three hubs schools, four hub 1 partner schools, seven hub 2 partner schools and three hub 3 partner schools. Since “school type” is the only important factor to be accounted for in the randomisation, the minimisation scheme reduces to stratified random allocation of schools in each stratum. To randomly allocate schools in each stratum to either year 5 or year 6 interventions, permuted block randomisation with a fixed allocation ratio will be used. The hub schools will be randomly allocated using a permuted block size of three with an allocation ratio of 2:1 in favour of the year 5 intervention group. The partner schools of hub 1 will be allocated to either year 5 or year 6 intervention groups using a permuted block size of four with an equal allocation ratio of 1:1. The partner schools of hub 2 will be randomly allocated to either year 5 or year 6 intervention groups using a combination of block sizes of 3 and 4 with allocation ratios of 2:1 and 1:1, respectively. The partner schools of hub 3 will be randomly allocated to either year 5 or year 6 intervention groups using a block size of 3 with an allocation ratio of 1:2 in favour of year 6 intervention group. Each block size will be randomly selected from its entire possible realisation based on the permutation of year 5 or year 6 intervention groups according to the specified allocation ratios. There are three possibilities using a block size of three with allocation ratios of 2:1 or 1:2 and six possibilities for a block size of 4 with an equal allocation ratio of 1:1. In summary, the randomisation will result in 9 schools randomised to year 5 intervention groups and 8 schools randomised to year 6 intervention groups. The year 5 intervention groups will be made up of two hub schools, two hubs 1 partner schools, four hub 2 partner schools and one hub 3 partner schools. The year 6 intervention groups will be made up of one hub school, two hub 1 partner schools, three hub 2 partner schools and two hub 3 partner schools. The randomisation scheme will be implemented in R statistical software.



#### **4. Outcomes**

The standardised tests from the CEM InCAS system will be used to measure changes in attainment for all the children recruited for the pilot trial. Changes in attainment will be measured before and after the delivery of the intervention in all schools in all years for the pilot trial.

##### **Primary outcome**

The primary outcome measure for the pilot trial is literacy as measured by the children's reading score. The primary outcome will be assessed at baseline and post intervention.

##### **Secondary outcomes**

The secondary outcome measures are literacy as measured by the children's spelling score and mathematics (as measured by the children's general mathematics and mental arithmetic scores). General mathematics and mental arithmetic scores will be analysed separately. The secondary outcomes will be assessed at baseline and post intervention.

#### **5. Analysis**

All analyses will be conducted on an intention to treat basis, including all randomised children in the groups to which they were randomised. Analyses will be conducted in SAS version 9.3, using 2-sided significance tests at the 5% significance level.

##### **Baseline Characteristics**

Baseline characteristics (gender, age, free school meal status, baseline reading, baseline spelling, baseline general mathematics and baseline mental arithmetic scores) will be summarised by intervention group for each school and across all schools. Continuous variables (age, baseline literacy and baseline mathematics scores) will be summarised using descriptive statistics (n, mean, standard deviation, range and median). Categorical variables (gender and free school meal status) will be summarised using frequency counts and percentages by intervention group for each school and across the schools.

##### **Trial completion**

A CONSORT diagram will be used to present a summary of the flow of eligible children and their schools from recruitment through baseline assessment, randomisation, post intervention assessment and analysis. The number of children and schools included or excluded at each stage will be clearly stated and the reasons for exclusion will also be stated, where available.

##### **Primary outcome**

The primary outcome (reading score) will be analysed by class (year 5 and year 6) to test the null hypothesis that there is difference in the average reading score between those randomised to SHINE and those not randomised to SHINE after accounting for baseline reading score, gender, age, free school meal status, school type and potential clustering within schools.

A generalised linear model with Gaussian family distribution and identity link will be fitted to the data. The parameters of the model will be estimated by generalised estimating equation (GEE) with exchangeable working correlation for dependencies within schools in

order to obtain robust standard errors for average differences between the intervention and control groups. This model will account for age, gender (1- female, 0-male), intervention groups (1-intervention, 0-control), school type and baseline reading scores. Model assumptions will be checked and if they are in doubt the data will be transformed prior to analysis or alternative parametric distribution that best reflects the data will be used. The average intervention effects, corresponding 95% confidence interval (CI) and associated p-value will be reported from the model.

### **Secondary outcomes**

The three secondary outcomes: children's spelling, general mathematics and mental arithmetic scores will be analysed in the same manner as the primary outcome. Each model will account for age, gender (1- female, 0-male), intervention groups (1-intervention, 0-control), and school type as well as baseline scores of the corresponding secondary outcome. The average intervention effects, corresponding 95% confidence interval (CI) and associated p-value will be reported from the model.

## **6. Analytical Software**

The data will be analysed with SAS<sup>®9</sup> 9.3 Software. Specifically, the following SAS procedures will be used:

- *Proc data*: for data preparation
- *Proc means*: for producing descriptive statistics for continuous variables
- *Proc freq*: for producing descriptive statistics for gender
- *Proc Genmod*: for fitting GEE models for the primary and secondary outcomes.

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**171012**