

Evaluation Summary	
Age range	Primary (Year 5)
Number of pupils	c. 840
Number of schools	30 schools
Design	Randomised controlled trial, randomised at the pupil and school level
Primary Outcome	Literacy

## BACKGROUND

### **Significance**

The Changing Pupils' Mindsets projects is based on the work of Carol Dweck and colleagues about the theories that children hold about their intelligence, in particular whether it is a 'fixed entity' or a 'malleable' quality that can be developed. Research with 12-14 year olds in the US, conducted by Dweck found that those who agreed with the idea that "You can always change how intelligent you are" outperformed, compared with similar peers in the same school, those who believed that "You have a certain amount of intelligence and you can't do much to change it". Other US research found that mentoring pupils with a Changing Mindsets approach led to improvements in standardised tests. The project is trialling the approach in the UK for the first time in Portsmouth primary schools with Year 5 pupils.

### **Intervention**

The project is testing two models of changing the way pupils think about themselves and their intelligence.

1. Intervention 1 involves a nine week course of mentoring and workshops from trained university students and external agencies (the local football club's Study Centre and the Education Business Partnership). The control group in this trial receive general study skills support.
2. Intervention 2 involves training teachers in how to teach pupils about the malleability of their intelligence, and how to reinforce this in their lessons through how they communicate with pupils, for example by praising their effort. Teachers in control group schools receive the training one year later.

## RESEARCH PLAN

### **Research questions**

The questions the evaluation was designed to answer are:

- what is the impact on children's attainment from each of the two interventions?
- what is the impact on children mindset from each of the two interventions?

## ***Design***

### **Intervention 1 is based on pupil random assignment within six schools.**

Pupils participating in the trial are randomly assigned to either the intervention group or a control group. Pupils in the intervention group receive a nine week course of mentoring and workshops from trained university students and external agencies (the local football club's Study Centre and the Education Business Partnership). The control group receive general study skills support.

The only pupil information that was available for all eligible pupils at the time of randomisation was their first name, so no stratification was possible.

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

- In each school, the names of eligible pupils were sorted alphabetically by the first name of the pupil (this was the only information about the pupils that was available in all schools at the time of the randomisation). The pupil whose first name was first in the alphabet was allocated number 1 with the pupil whose first name was next in the alphabet allocated number 2, through to the pupil whose first name was last in the alphabet being allocated number N (the number of eligible pupils in each school).
- Each pupil was then assigned a randomly generated number.
- Pupils in each school were then sorted by the random number
- The first pupil was randomised into either the treatment or control group.
- Each subsequent pupil was assigned to have the opposite outcome of the previous pupil.

### **Intervention 2 is based on school random assignment for 30 schools.**

Schools participating in the trial are randomly assigned to either the intervention group or a control group. Teachers in intervention schools receive training in how to teach pupils about the malleability of their intelligence, and how to reinforce this in their lessons.

Randomisation was carried out 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 KS2 in both English and Maths. Attainment data was not available for all schools in Southampton, so all schools in Southampton formed one block. Schools in Portsmouth and Hampshire were each split into two blocks based on low or high attainment (with thresholds chosen to achieve equal sized groups in each area). This resulted in 5 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 blocking variable and, within each block, by the random number
- The first school was randomised into either the treatment or control group.
- Each subsequent school was assigned to have the opposite outcome of the previous school.

## ***Participants***

For intervention 1:

The six schools in Portsmouth with lowest levels of attainment were recruited for intervention 1. All pupils in the year 5 cohort in these schools were eligible to participate.

For intervention 2:

All other Portsmouth schools with a year 5 cohort were approached to offer them the chance to take part in intervention 2. A workshop was held for interested schools where it was explained what would be involved in the trial. Schools were then asked to sign up to the trial at the end of the workshop. Other schools were recruited following telephone calls and in some cases there was an additional school visit.

When more schools were required for the trial, recruitment was extended to include schools with a Year 5 cohort in Hampshire and Southampton Local Education Authorities. The Education Service contacts in each area emailed schools to invite them to participate in the trial and the recruitment process was then the same as in Portsmouth. Following the initial email, two workshops were held for interested schools and they were asked to sign up to the trial at the end of the workshop. Other schools were recruited following telephone calls that explained what was involved in the trial.

All pupils in the year 5 cohort in these schools were eligible to participate.

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

- Clearly defined primary and secondary outcomes and how they are measured.
- Details of any plans to ensure tests are blinded (eg, random allocation after pre-test and blind assessors at post-test)

The outcome measures for both interventions are provided by GL Assessments: the Progress in English (PiE) and Measuring Success in Maths. Mindset is measured using Carol Dweck's original items, utilising a 5 point likert scale:

- 1) You have a certain amount of intelligence, and you really can't do much to change it.
- 2) Your intelligence is something about you that you can't change very much.
- 3) You can learn new things, but you can't really change your basic intelligence.

The analysis will not be blinded. Assessors and data analysts will know the intervention status of each school.

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

- How sample size is determined and any power calculations that are being used, including assumptions.

For intervention 1:

The aim of the trial is to recruit six schools to the study with pupils in each school randomised into treatment and control groups. The power calculations assume 40 pupils per school, 0.05 significance level, 0.8 power. The minimum detectable effect size was estimated to be in the range of 0.4 to 0.5 standard deviations.

For intervention 2:

The aim of the project is to recruit 30 schools to the study with 15 schools randomised into treatment and control. The power calculations assume 40 pupils per school, 0.05 significance level, 0.8 power and 0.1 to 0.15 intra-cluster correlation. The minimum detectable effect size was estimated to be in the range of 0.3 to 0.4 standard deviations.

### ***Analysis plan***

For intervention 1:

The analysis will be carried out using regression models to compare pupil outcomes for those randomly assigned to the intervention group or treatment group.

We will consider a number of subgroups defined by pupil characteristics. These include:

- children receiving free school meals (FSM) compared to non-FSM children;
- ethnic minority children compared to white children
- children with low attainment scores on the pre-test compared with children with higher attainment scores on the pre-test

For intervention 2:

The analysis will be carried out using multilevel regression models to reflect the clustered nature of randomisation. The model will be specified in order to allow comparison of pupil outcomes for those attending intervention or treatment group schools.

We will consider a number of subgroups defined by pupil characteristics. These include:

- children receiving free school meals (FSM) compared to non-FSM children;
- ethnic minority children compared to white children
- children with low attainment scores on the pre-test compared with children with higher attainment scores on the pre-test

### ***Process evaluation methods***

NIESR is conducting a qualitative evaluation of Changing Mindsets which will include a process evaluation and qualitative research on the programme's effectiveness. This is with a view to identifying features which contribute to successful implementation, including practicalities. Qualitative research will also be aimed at bringing greater clarity to the quantitative research findings and understanding the reasons behind the estimated impacts.

The qualitative evaluation will include the following elements:

- Interviews with undergraduate facilitators
- Interviews with head teachers and Year 5 class teachers in selected Changing Mindset schools at two stages
- Observation of workshops in selected Changing Mindset schools
- Interviews with Portsmouth partners
- Interviews with teachers in Teacher Inset Intervention at two stages

## PERSONNEL

Portsmouth University Psychology Department is running the intervention and coordinating the trial. This includes designing the materials, training undergraduates to deliver Changing Mindsets and study skills programmes in schools and delivering teacher training. The Education Department of Portsmouth Local Authority has been involved in recruiting schools and will also assist in the evaluation by facilitating access to schools by evaluators. The project lead at Portsmouth University is Dr Sherria Hoskins, and other key staff are Victoria Devonshire and Frances Warren. Key staff at Portsmouth City Council are Nicola Waterman and Kate Kennard.

NIESR is responsible for evaluating the project. The evaluation is being led by David Wilkinson who is responsible for the impact assessment. Heather Rolfe is conducting a qualitative, process evaluation of the project. Other key staff at NIESR are Richard Dorsett, Anitha George and Cinzia Rienzo.

## TIMELINE

<i>Term commencing</i>	<b>September 2012</b>	<b>January – March 2013</b>	<b>April – June 2013</b>	<b>September 2013</b>	<b>January 2014</b>	<b>April 2014</b>
Development and school recruitment						
Pupil intervention in 6 schools– university-led workshops						
NIESR Interviews with students delivering Changing Mindsets and Study Skills						
Teacher training – 15 intervention schools receive training						
NIESR evaluates teacher INSET						
NIESR interviews teachers in intervention schools						
Pupil intervention – Pompey Study Centre and EBP						
NIESR interviews project partners						
Follow up pupil assessments						
NIESR carries out follow-up interviews with teachers						
Teacher training – 15 control schools and 6 pupil intervention schools						

## RISKS

The following table summarises the main risks to the evaluation and how they might be addressed

<b>Issue/risk</b>	<b>How risk might be addressed</b>
Problematic randomisation	When randomising clusters rather than individuals, the chances of a 'bad draw' increase. This is because the tendency towards statistical equivalence of treatment and control groups grows with the number of units randomised. In this evaluation, 30 schools are randomised which is a small enough number to carry the risk of the treatment and control groups differing in important ways. One solution to this is to draw blocks similar of schools within which randomisation takes place.
Contamination of the random assignment design	Complications arise when the real-life behaviour of subjects in randomised control trials is at odds with the conceptual design of the experiment. Pupils may not receive all of the treatment. To achieve anything other than the effect of intention to treat will be difficult. However, to help understand the nature of the estimated impact better, monitoring information should be collected on programme attendance.
Confusion in evaluation tasks undertaken by Portsmouth University and NIESR	Tasks and roles for each organisation have been agreed at the outset of the project.
Unexpected absence of team members	The team will substitute for each other during any short-term absence. In the event of longer periods of unplanned absence, NIESR will involve other NIESR experts in evaluation and education if necessary.
Low impact report	Our reporting will be aimed at ensuring maximum impact of findings through summaries and guidance for EEF schools. Reporting will focus on best practice and implications for policy and practice.

## DATA PROTECTION STATEMENT

NIESR has established systems which comply with the stringent requirements of data protection legislation and best practice in data security and research ethics. This compliance includes the use of encryption, secure passwords, lockable paper files and secure entry to the office building (which does not have any public access). Computing facilities include secure data transfer through a VPN system and the use of stand-alone computers for data use. Through training, staff are made aware of the importance of ensuring that data security is not compromised.