CHANGING MINDSET

Testing whether teacher-led sessions can encourage pupils to adopt a "growth mindset"

Proposed scale	
Age range	**Primary (Year 6)**
Number of pupils	**~4000**
Number of schools	**100**
Area	South East, South West, Midlands, North East and North West

Significance

The Changing Pupils' Mindsets project is testing Theory of Intelligence developed by 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 an effectiveness trial of the pilot EEF project Changing Mindsets, and is implemented with primary schools with Year 6 pupils.

Intervention

The project is testing a model of changing the way pupils think about themselves and their intelligence. Specifically, the intervention aims to support schools in encouraging "growth mindsets" in their pupils (the belief that intelligence can be developed, rather than being a fixed trait).

Teachers will receive training that introduces them to mindset theory and evidence and provides them tips for how to embed the approach in their classrooms/schools (e.g. how to communicate incremental beliefs to pupils through feedback/praise). To supplement these suggested changes to everyday practice, teachers will be given the materials/training to run an 8 week programme (up 2.5 hours a week) of weekly lessons and activities.

The programme was developed by Growing Learners and will include additional materials and videos from Positive Edge Education. Growing Learners is a team of education research psychologists, from the Department of Psychology at the University of Portsmouth, led by Dr Sherria Hoskins.

http://www.port.ac.uk/department-of-psychology/community-collaboration/growing-learners/

Positive Edge Education is a company that develop holistic educational programmes designed to inspire and engage, founded by Thomas Westenholz.

https://positiveedgeeducation.com/

Who is trained

> Year 6 teachers (and year 5 teachers – as the waiting control)

> For schools in the intervention group: Head teachers and Year 6 teachers will be invited to attend one of approximately 10 training days hosted across the UK in September/October 2016.

> For schools in the wait-list control: Head teachers and Year 5 teachers will be invited to attend one of approximately 10 training days hosted across the UK in June/July 2017.

What are the aims of the intervention (e.g. what is it trying to change), who is the intervention aimed at (e.g. age range)

> Primary aim: Can a Mindset intervention increase Y6 Literacy scores (as measured by Key Stage 2 Standard Attainment Tests) and self-regulation (subscale from the MSLQ).

> Secondary aim: Can a Mindset intervention increase Y6 Maths scores (as measured by Key Stage 2 SATs and self-efficacy (subscale from the MSLQ).

How long is the intervention

> 8 weeks (about 2 hours a week)

> · Are there supporting materials

> Yes – intervention manual, lesson plans, learning materials and videos.

> · Details from previous trial and why it is appropriate to do this trial

This trial combines two interventions from the previous trial (which showed promising results) - 1) training pupils using a structured series of learning resources and activities in the intervention developed (it was 6 weeks at that point, plus 4 weeks of local charity input but has since undergone a redeveloping and refining process) and 2) training teachers in Mindset theory and offering tips for every day practice. The aim of the current project is to train teachers to deliver the 8 week intervention to increase longevity and cost-effectiveness.

METHODS

Research questions

The primary questions the evaluation was designed to answer are:

1. What is the impact on the attainment of pupils who receive the intervention, compared to pupils who do not receive the intervention?

2. What is the impact on the self-efficacy and self-regulation (as measured by the MSLQ Pintrich & Van De Groot, 1990) of pupils who receive the intervention, compared to pupils who do not receive the intervention?

Design

The design is for a 2 arm trial, with schools participating in the trial randomly assigned to either the intervention group or the control group. All schools will pay £500 to receive the intervention (this is a discounted rate). All schools with receive the full Changing Mindsets training. Schools in the intervention group will receive their training in September/October 2016, while wait-list control schools will receive the training two academic terms later. This is an effectiveness trial, being delivered as it would be at scale. 100 schools in South East, South West, Midlands, North East and North West will be recruited to the trial.

Randomisation will be carried out using block randomisation techniques ensuring balance between the treatment and control groups, controlling for prior attainment, and area. A log file of the randomisation process will be kept.

Randomisation of schools (to achieve a 50:50 allocation) will be performed as follows:
- Each school will be assigned a randomly generated number;
- Schools will be sorted by blocking variable and, within each block, by the random number
- The first school will be randomised to treatment or control;
- Each subsequent school will be assigned to have the opposite outcome of the previous school.

Participants

The study comprises primary schools in the South East, South West, Midlands, North East and North West. Within each school, the trial focuses on year 6 pupils. Schools that are randomly assigned to be intervention schools will have their Year 6 teachers trained in the Changing Mindsets intervention. Teachers will deliver the intervention to the whole class.

- schools that have not used a systematic mindsets programme with their Year 6 cohort were eligible.

- Schools should also be able to attend one of the training dates provided by Portsmouth.

- If there is a high degree of interest from schools then we agreed that we would prioritise schools with a high number of FSM pupils, or schools were there was a significant gap between FSM and non-FSM pupils.

As a condition of being entered into the randomisation school will need to provide the following:

- Confirmation that parent opt-out consent forms have been sent out.

- Pupil data form including UPNs for all year 6s.

- Baseline teacher questionnaire.

Outcome Measures

The primary outcomes will be literacy and numeracy as measured by the national Key Stage 2 tests at the end of the first year. The secondary outcome will be a measure of the impact of the intervention on non-cognitive skills, captured through the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & Van De Groot, 1990). Specifically, the secondary outcome measure will focus on two subscales of the MSLQ: self-efficacy and self-regulation.

Pre-test non-cognitive measures would be completed prior randomisation, and will be part schools' requirement to be entered into randomisation. Post-test using the same measures would be administrated prior to Easter 2017. Non-cognitive measure tests would be sent out digitally to teachers to print, distribute and administrate to pupils. Schools would send completed tests to Portsmouth who would blinding input and mark the tests.

In addition, there will also be a measure of fidelity to the treatment to be used to establish the on-treat effect within the intervention arm. This information from teachers will be collected by Portsmouth via an online platform at the end of each module. Data collected will include: number of activities completed, date, time on each session, number of pupils that attended the session, what lesson the session displaced. There will also be a feedback free text box. Prior to implementation (i.e. before the intervention is delivered) Portsmouth will predetermine what high, medium and low fidelity looks like.

NIESR will incorporate this analysis into its external evaluation, adding it to other data collected on fidelity through interviews and surveys.

Key Stage 2 Reading and Math grade (using the prevailing grade points system) data will be used as a baseline indicator of attainment.

Sample size calculations

The aim of the project is to recruit 100 schools to the study. A minimum detectable effect of 0.20 has been estimated. This assumes the following:
- proportion of schools assigned to treatment 0.50
- 40 children per cluster
- 0.05 significance level
- 0.8 power
- 0.25 intra-cluster correlation.

This is a conservative ICC and the calculation does not factor in stratification, which would increase the power.

Assuming the Free School Meal (FSM) sub-group is 15.7% of the total size of the sample (based on data from DfE statistics for secondary schools and ignoring that it may be higher if recruited schools are in more disadvantaged areas), and maintaining all other assumptions (which is likely to be a conservative approach, given lower levels of within-group variation in this sub-group), there is an estimated minimum detectable effect size for this group of 0.27 standard deviations.

Analysis plan

The analysis will be carried out using multilevel regression models to reflect the clustered nature of randomisation.

We plan to use the prevailing grade points system for the primary outcome:
- English grade (using the prevailing grade points system)
- Maths grade (using the prevailing grade points system)

The two types of schools included in the trial are:
a) intervention schools that deliver Changing Mindsets
b) control schools that will receive the intervention one year later

The model will be specified in order to allow the following types of comparison:
a) vs
b) will give the combined impact of teacher training.

The estimated impact will be based on the difference between a) and b), regardless of contamination of the control schools or drop out by intervention schools. This is in order to estimate the "intention to treat" (ITT) effect. In addition, the regression models will only include prior attainment.

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

- children receiving free school meals (FSM) compared to non-FSM children;

- children with low attainment scores on the KS1 compared with children with higher attainment scores on KS1

We will also consider one subgroup defined by school characteristics. Specifically, schools in which there was high fidelity to the planned intervention, using fidelity measures on the treatment group only, about the implementation of the project in that school during their monitoring reports.

Estimated impact in terms of Key Stage 2 attainments and non-cognitive measures will be converted into a Hedges' g effect size (1981). This will use the estimated total pooled standard deviation of the treatment and control groups, rather than the within-school pooled standard deviation as this is a more conservative approach (although estimates will also be produced on this basis to check they do not differ much). Intra-cluster correlations from the multilevel model of the impact will be reported, along with the intra-cluster correlations for the pre-test.

Process evaluation methods

Summary of research questions to be addressed by the implementation and process evaluation

The process evaluation will aim to understand the implementation process, the experiences of teachers and pupils, to understand fidelity and to explain outcomes and impacts. The basic features of our design are:

- Attendance at the recruitment event and training day

- Analysis of resources and of data collected by the project team

- On-line survey of teachers in the intervention schools

- Paper survey of teachers in the control schools at around the time of the second year training, substituted by a short on-line survey if attendance is low.

- Visits to 6 schools to:

    o interview project leads and class teachers involved in the intervention

    o observe pupils' responses to and engagement with growth mindset, through attending the final session, where pupils design a poster

- Summary of methods to assess programme fidelity

- To establish fidelity in implementation, we will look particularly at whether the programme is delivered as intended by schools, the project lead and class teachers. We will explore fidelity of implementation in interviews with teachers. We will also include questions aimed at both establishing fidelity within the on-line survey. In addition, we will draw on data available through the logs collected by the project team.

- To explore the issue of fidelity, we would look for consistency both within and between schools, for variation in both understanding of growth mindsets and delivery of its messages. Adaptations may not compromise fidelity but be positive, enhancing quality and indicating ways in which the programme might be improved to have a greater impact on pupils. However, it will also be important to understand whether the programme can be used effectively by teachers with a range of views and levels of commitment to its concepts and components and does not rely on teachers' own beliefs about growth mindset.

Cost

It is important for users of the EEF toolkit that good data on the financial and non-financial costs of selecting this intervention are provided. However, it is also important that there is not double counting of resources that would have been used in any case, albeit in a different way in the absence of the intervention, otherwise this would result in an undervaluation of the intervention in a cost-benefit calculation. We do not foresee the need to report any additional pre-requisites for taking part in this evaluation, as it seems likely that all schools should be able to implement assuming there is the staffing will to do so.

We will work closely with the project team to capture information on the costs per school that they have expended as part of the trial. In addition, the process evaluation will include aspects (including in interviews and surveys that uncover potentially unforeseen costs, as well as checks on whether the estimates and assumptions made as part of the costing process seem credible.

The costs will be averaged over the intervention period and will be reported to include, but need not be limited to:

- The direct cost of receiving Changing Mindset teacher training;
- Administration, project management, and time (University of Portsmouth staff);

We will convert the estimated cost per school into a cost per pupil using the average number of pupils in the schools in the treatment group.

Non-financial costs to be reported will include, but need not be limited to:

- Additional lead teacher and administrative support time for the organising of the Changing Mindsets training.
- Teacher time attending Changing Mindset training.

PERSONNEL

The University of Portsmouth is responsible for delivering the intervention, while NIESR is carrying out the evaluation. Roles and responsibilities are as follows:

Design of the trial

- sample size calculations - NIESR

- refinement of randomisation approach - NIESR

Delivery of the intervention

- recruitment of schools - University of Portsmouth

- delivery of teacher training - University of Portsmouth administration of non cognitive skills measure and construction of database – University of Portsmouth

- incorporation of NPD – NIESR

Impact analysis - NIESR

Qualitative analysis - NIESR

TIMELINE

- Recruitment of schools to be completed by mid March 2016 (University of Portsmouth)

- Randomisation in March 2016

- Teacher training in treatment schools to be carried out in Autumn 2016 (University of Portsmouth)

- Process evaluation:
  - Attendance at training, analysis of materials and visits to schools – Autumn 2016
  - Survey of intervention schools – Winter 2016
  - Survey of control schools – Summer 2017
- Non-cognitive measures pre-test to be carried out before randomisation (Easter 2016); non-cognitive measures post-tests to be carried out after Easter 2017.

- Final report on impact analysis by end-January 2018 (NIESR)

Ethics and registration

We take seriously the ethical issues raised in both the quantitative and qualitative elements of the research. NIESR adheres to the Ethics Guidelines of the Social Research Association (SRA). Members of the process evaluation team have Disclosure and Barring Service (DBS) clearance. The ethical implications of the research have been discussed, with reference to the SRA guidelines (in particular their Standard Protocols for Checking Ethical Considerations), by members of the project team and NIESR's Senior Management Team to determine the appropriate course of action and whether further approval is needed. While NIESR has an ethics committee consisting of Trustees, we do not consider that this trial requires such additional clearance; this decision has been ratified by our Director.

As part of this trial we will be collecting personal information and applying for data from the National Pupil Database (NPD) using this data. However, we will not be linking these data with any other sources; whether participants are in the treatment or control groups will be identified from the school that they attend. Participants' confidentiality and anonymity will be safeguarded by the methods that we have in place. On this basis, we judge that it is appropriate for the trial to use an opt-out consent process, with participants' parents (or legal guardians) making an informed decision based upon the information set out below.

The parental information sheet will be provided with the opt-out form containing information on the aims of the research and the use of data in order that they are able to make an informed decision about whether to withhold consent from participation. The form itself will make it clear and simple for parents to ensure their child(ren)'s data is not requested from the DfE and hence they will not be part of the trial. In addition, children who have been opted out will not be included in the quantitative analysis.

Data from the NPD and pupils information obtained from the schools will be transmitted and stored using the security principles underlined in the NIESR Data Security policy. This includes secure transfer of data and use of password-protection and encryption as appropriate during data storage.

RISKS

Data protection statement

In order to undertake contracts for a variety of government departments, agencies and charitable trusts, NIESR has established systems which comply with the stringent requirements of these organisations. 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. Staff are made aware of the importance of ensuring that data security is not compromised.

Some of the key risks are listed below:

☐ There is a risk that schools will not take part in the programme. NIESR will work closely with University of Portsmouth to convey the importance of the evaluation to schools participating in the programme and the value to them of taking part;

☐ There is a risk that the sample will be biased because of a 'bad draw'. This risk increases when randomising clusters rather than individuals. This is because the tendency towards statistical equivalence of treatment and control groups grows with the number of units randomised. In this evaluation, 100 schools will be 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.

☐ The project may have different impacts between schools because of variations in implementation. For example, expert teachers may vary in the extent to which they spread the Changing Mindset approach further within their schools. This will be explored in the process evaluation. The process evaluation will aim to establish any differences between experience and expertise of participating teachers which might explain overall effects or differences in outcomes between schools.

☐ Staff absence is a general risk to projects such as this. The evaluation team will substitute for each other during any short-term absence. In the event of longer periods of unplanned absence or departure, we will recruit replacements. We have a number of experts in evaluation and education who could substitute for members of the team, should this be necessary.

☐ There is a risk that the findings will have little impact, particularly if the statistical effects are found to be weak. Our reporting will be aimed at ensuring maximum impact of findings through summaries and guidance for EEF schools on how to implement the Changing Mindsets programme effectively. Reporting will focus on best practice and implications for policy and practice. Our wider dissemination and expertise in dissemination will ensure that findings are covered in appropriate press and other media.