

Evaluation Summary	
Age range	Year 7
Number of pupils	c. 3,000
Number of schools	c. 24
Design	Whole school randomised controlled trial
Primary Outcome	Literacy

Education Endowment Foundation

Project Based Learning - Evaluation Protocol

CEM Durham University and York Trials Unit

This protocol was revised in January 2015 after a decision made between EEF and the Innovation Unit not to continue with the main trial intervention for a second year, as this would have required additional funding beyond the initial grant.

Updates were also made following the development/piloting year. The changes and any reasons for them have been described in the relevant sections.

Introduction

Following an initial meeting between the EEF, IU, and Durham / York, it was agreed that there will be two stages to this evaluation. The first will be a research and development and pilot trial phase, during which the intervention will be developed, the likely measures and indicators tested, and the main evaluation protocol finalised. The second phase will be the impact evaluation itself. While this second phase was originally designed to be a two year RCT, changes to funding have meant the RCT and intervention delivery have been shortened to one year. The process evaluation will continue for two years.

Significance

Updated: Added in a paragraph detailing the impact a one year trial will have on the significance of the research and what can be learned from it.

Project Based Learning (and related) approaches have been advocated, and in varying degrees, developed and used in school teaching for many years. However, very few impact evaluations have ever been carried out, particularly within the English education system. This project therefore provides a timely opportunity to assess both the impact of Project Based Learning (PBL) and its potential adoption in schools.

PBL is a complex intervention, in that it requires many different aspects of the education processes to work together in new and in some instances quite different ways. This presents a challenge for designers of any such programme in terms of developing an intervention that will have an impact on both educational attainment and engagement, as well as being reasonably easy to implement, and being financially viable for schools.

In terms of policy, the intervention fits well with the EEF objectives of reliably testing new and innovative approaches to education, and supporting a move to more 'joined up' education.

Moreover, besides improving attainment and engagement in the target group, the intervention may also help address the 'Year 7 dip' issue, i.e. where children appear to make little progress in the early stages of Key Stage 3.

Update: The trial detailed in the original protocol would have looked at outcomes after two years of delivery of the intervention which, given the organisational adjustments, staff commitments and professional development involved, would have allowed better embedding of the intervention and for schools to have become more independent with their delivery. The change to one year of intervention delivery means that outcomes will be measured after only one year of delivery and the intervention will be more tightly structured. We would expect that measuring outcomes after only one year might reduce the effect size as teachers are still learning the best way to use the methods and schools will be adjusting to change. The one year delivery period will reduce what we can learn in the process evaluation about interventions that involve significant organisational change for schools. However we will now also be looking at the impact through the process evaluation on how the intervention has been embedded in to the schools once the main input and support from the IU has ended. This is an important additional research question for major organisational change interventions such as PBL.

Intervention

Updated: Description of the intervention updated based on IU handbook and training for schools in main trial.

The Innovation Unit have developed a Project Based Learning intervention called 'Learning through REAL projects'. Broadly speaking this involves teachers designing and planning projects which enable pupils to produce a publicly-exhibited output such as a product, publication, or presentation. Projects are designed by teachers to be driven by an initial 'real world' question and to allow students to cover pre-planned significant educational content. Each project leads to a student-created output which has a purpose and is displayed to an audience relevant to the project. The focus is on producing high quality work which has value to the students and relevance outside of school. Project work involves creating multiple drafts of work incorporating feedback and suggestions ('critique') from peers, teachers and others, such as community members, into their work. Projects also allow flexibility for student creativity and direction in creating outputs.

For a school to incorporate this method of teaching, the intervention has minimum requirements for the organisation of the school, staffing and the curriculum as well as classroom practices during REAL projects lessons; all of these factors can be significantly different to normal school practice. The intervention involves all pupils in Year 7 in participating schools working in mixed ability classes. Learning through REAL projects lessons need to be timetabled to account for at least twenty percent (but more is recommended) of the Year 7 timetable and at least one project during the year should account for a total of 6 or more days learning time. The timetable should include blocks lasting at least half a day for Learning through REAL projects work. Teachers are required to plan or adapt the projects which take place in their schools and planning time of at least one hour a week should be given to the team leading the work. Projects should be planned in conjunction with the English department and at least one other discipline so that links can be made between traditional instruction and PBL. There is also a requirement for a member of the school leadership team to be a part of the team leading the work in the school.

The intervention includes support for teachers and school leaders through the year. This includes training for teachers in the two terms before the intervention begins: three day induction training with other schools involved looking at project design, teaching and assessment; 3 days planning and design support from a leadership coach; 3 days in-school classroom support for project development and INSET for all staff in the school. During the school year, once the intervention has begun, the Innovation Unit also provides classroom support one day per fortnight from an experienced teacher from High Tech High and 9 days of Innovation Unit leadership coach support to project leads and school leaders.

This is an intervention that involves a high degree of organisational setup, intensive initial training, a period of supported planning and continued intensive support through the delivery of the intervention. It requires the commitment from both leadership and class teachers to change their practices and make it work.

Key research questions

Updated: Removed impact on numeracy and science as a research aim after piloting revealed that the intervention did not consistently involve these subject areas and the intervention was unlikely to have impacted on them. Bringing forward the outcome assessment also meant that the planned Insight computerised assessment which included maths and science, was not suitable for the age of the pupils and separate tests would require additional resources as well as time from schools.

Removed differential impact on EAL aim due to data protection issues with collecting this data.

1. What is the impact on literacy (primary outcome) for the target pupils in the intervention schools compared to the control schools?
2. What is the impact on engagement for the participating pupils?
3. What is the impact on aspirations and attitudes to learning more generally?
4. Are there differential impacts; e.g. FSM, prior attainment and gender?
5. What is the existing evidence underpinning the pedagogy?
6. What is the feedback from students?
7. What is the feedback and professional assessments from teachers and school leaders?
8. How effective and appropriate is the training and professional development?
9. What are the commitments and implications to schools adopting the programme?
10. What are the direct and indirect costs of delivering the programme?
11. What are the key success factors and barriers to successful implementation?
12. Are there any other areas of the programme that could be further developed (following the completion of the trial)?

Programme development phase and pilot trial

Updated: Given staff changes that have occurred since the original project plan and protocol we have removed references to named staff.

This will serve two key purposes: firstly the development of a delivery model for the intervention, and secondly, it will provide data for use in the planning and conduct of the main trial and the analyses. Given the complexity of the intervention, this is a particularly important element, and even more so given the relatively small number of intervention schools (12) in the main trial with the consequential need to ensure that the programme is delivered in an effective way.

The evaluation team will provide formative feedback and an independent expert perspective on the development of PBL. This will be based on the feedback from the pilot phase and will include, the pedagogy, delivery, organisation and support. A summary of this will be included in the final report and interim report to the EEF.

A pilot trial with between four and six schools will begin in September 2013. Individual schools will either offer the intervention to the whole of their Year 7 pupils (so as to simulate the main trial) or to a limited number of Year 7 classes. In this second scenario we will, where appropriate, work with the schools to randomise the allocation. Comparisons in terms of outcome data will be made either on the basis of the randomisations (i.e. Intervention and Control) or expected progression in terms of the test's standardised norms. The project administrator will have primary responsibility for maintaining contact with the schools on behalf of the evaluators and will liaise closely with the IU team.

The Key Stage 2 results (obtained through the NPD) will be used as a pre-test, and CEM tests taken in July 2014 will be used as outcome measures. Literacy will be the primary outcome. Other elements including numeracy, science, engagement (including school attendance) and attitudes to learning will also be assessed.

Throughout the pilot trial phase the evaluation team will work closely and in a formative way with the IU and pilot schools, and qualitative and process data will be fed back to the IU project team to assist them in finalising the intervention for the main trial. A summary version of this element will also be included in the final report.

Update: Although it was planned to run a trial during the pilot year, the short time scale with recruiting schools and organisational issues in the recruited schools meant that it wasn't possible to randomise schools or classes within schools to the intervention. Instead pilot schools offered the intervention to all of their Year 7 pupils (with the exception of one school where half the pupils received the intervention but this was done on ability rather than randomly). Outcomes were measured using the standardised test Progress in English 12.

Main trial and impact evaluation

Design

Updated: Changed delivery of the intervention to one year from original two year plan. Changed offer of intervention to control schools to be after one year and added in that control schools would be required to pay for the intervention (as per IU model). Details of randomisation included.

A total of 24 schools will be recruited during 2013 and early 2014, so as to be able to deliver the programme from Sept 2014 to their incoming Year 7 pupils. Schools will be recruited by January 2014 and randomisation will take part in January with the necessary school level training taking place in the spring term 2014. The randomisations will be carried out prior to any training, and the exact strategy in terms of any stratification will be agreed with the IU and EEF (details in update below). The 12 intervention schools will provide PBL to their Year 7s for a one year period from September 2014. The 12 control schools will continue to teach as normal, with no supported elements of PBL. After one year the control schools will be offered the fully developed final version of the intervention at their own cost.

Update: The randomisation was stratified based on year group size at the school (above or below the sample median (180)), free school meal eligibility over the last 6 years (FSM 6) (above or below the sample median (36%)), whether the school was a free school (yes/no) and whether the school already described itself on its website as doing some Project Based Learning (yes/no). The randomisation was completed by the York Trials Unit team on an anonymised datasheet, and the randomisation results were matched back to schools by CEM. Schools were informed of their allocation by CEM.

Power calculation

We make the following assumptions: a total sample size of 3000; a pre- and post-test correlation of 0.70 and an intra-cluster correlation coefficient of 0.19 and 120 students per year. The design effect would be approximately 3, giving an effective sample size of 100. This is increased by the pre- and post-test correlation to give an 'effective' sample size of 200. This would allow us to detect, with 80% power, a difference of 0.40 ($2p = 0.05$).

Outcome Measures

Updated: Changed from collecting outcomes through CEM INSIGHT system to Progress in English 12 GL literacy measure. This was due to the trial being shortened by a year meaning that the original assessment was no longer appropriate for the age group. Changed from collecting attainment outcomes on maths and science, which would have been included with the INSIGHT system, to only collecting literacy outcomes. This was because of resource implications as well as the time demands on schools for three separate educational assessments being too much. English was chosen to remain the primary outcome; the intervention explicitly states a focus on English and literacy and requires the involvement of staff from the English department. Piloting revealed that schools were not consistently involving maths or science in their REAL Projects lessons and the decision was therefore made not to assess these in a one year trial.

Details of the primary and secondary outcomes have been updated and have added in information on how assessments will be delivered.

Primary Outcome

Literacy attainment data as collected through the Progress in English 12 assessment will be the primary outcome for the trial. The overall raw score from this assessment will be used in the primary outcome analysis. The assessments will be marked by GL assessments and the results passed on to the school as raw and standardised scores. This may also act as an incentive for schools to take part in the research (either intervention or control). GL assessments will provide the research team with a spreadsheet of the pupil data but not the actual test papers.

Secondary Outcomes

Engagement & attitudes to school

Scores on an 'engagement' survey which looks at 'engagement with school and learning' will be used as a secondary outcome. This measure has been developed by the Durham team as part of this project to cover a broad concept of engagement. We started with reviewing the literature to identify how 'engagement' is conceptualised and to identify existing measures of engagement. Items from as many 'engagement' self-report measures as could be sourced, were collected into a database and categorised. The themes most relevant to the IU's theory of change model of the intervention were selected and items from these themes were adapted to suit the UK context and to be of appropriate age. For most items pupil responses are given on a four point Likert scale response to indicate how true the statement is. Items are not specific to individual lessons but to school and classes generally. The measure covers learning behaviours, student agency in learning, relationships with peers and teaching and feelings towards attending school. This measure has been developed during the pilot phase and refined following analysis of the pilot data.

We will also look at attendance data for the first two school terms of Year 7 obtained via the NPD as another secondary outcome. The percentage of possible school sessions attended by pupils will be used as a secondary outcome and as a proxy of engagement.

Aspirations

We will also ask pupils to complete survey items looking at their plans for when they leave school ("When you leave school would you like to..."). Items will be answered on a categorical scale of 'Yes', 'No' or 'maybe'.

Delivery of outcome measures

Outcome measures will be collected in June/July 2015. The literacy measure and survey measures will be delivered in exam conditions by a researcher directed by the evaluator who will be blind to the assignment of the school (i.e. intervention or control). This researcher will be supported by staff from the school. All measures will be given in one session lasting up to one and a half hours. At the end of the session the literacy measures will be boxed and sealed by the researcher for couriating to GL Assessment and surveys boxed and returned to CEM.

Analysis

The primary analysis will be by intention to treat (ITT). Because we have randomised at the level of the school we need to take this into account in our analysis. Consequently, we will use the Huber-White method to control for clustering. In addition to this our primary analysis will adjust for gender, school and pre-test results.

Process evaluation

Updated: More detailed description provided of most elements of the process evaluation.

Interviews/focus groups with developer team brought forward by a year. Teacher and pupil surveys brought forward by a year. Phone interviews with control schools added in to provide context to what they have been doing during the project and whether they plan to implement PBL in the following year.

Introduction and design

There are many aspects to this complex intervention and the implications for schools in terms of adopting PBL, and it follows that the process evaluation will be quite extensive. A cross-sectional study design will be used to collect observational and interview data from intervention schools at two time points during the project. The first will be during the main trial year when schools are delivering the intervention. These will be structured visits as described below. The second visit will be during the following year after school initial contract with the IU has ended. This second visit will allow us to look at the continued effect of the intervention on the school, further uptake of the approach and investigate the longer term sustainability of the model. This will be supported by a literature review, case studies, teacher and pupil surveys and interviews/focus groups with the developer team.

Methods

Literature review

This will seek to identify and contextualise the evidence underpinning the intervention. The output will form a part of the final report, and be used to identify detailed areas for the qualitative research design.

Training observations

Observations of training sessions held for teachers and school leaders will be conducted to help us understand the intervention and what is required. We will also look at how participants respond to the training. We will attend the initial group training sessions for teachers and school leaders during both the piloting and main trial phases. This will consist of direct observations and interviews with the participants.

Visits to schools

Six out of the twelve intervention schools will be chosen at random for two school visits. During the first we will conduct observations, interviews and focus groups with the staff and pupils (details below). This visit will take place between February and June 2015. The second visit will take place the following year between January and April 2016 and will involve observations and interviews as in the first visit if schools are still doing the intervention, and interviews with school leaders and the teachers involved in the previous years if schools have not continued with project based learning.

Lesson observations

Researchers will observe at least one project-based lesson and will record details of the visits using an observation schedule with headings and free form answers. They will be looking at the lesson content, the topic, how the lesson fits into the bigger project, activities pupils are doing, how staff are used and pupil engagement with the lesson.

Teacher focus groups

We will hold a focus group in each school with 3 to 5 teachers who are involved in the delivery and planning of the intervention. These focus groups will be recorded with the permission of the participants. A topic guide will be used to structure the focus group and topics will include the teachers' context, details and reflections on projects delivered, the REAL projects model, benefits for pupils, impact on teaching, barriers to implementation and the support required and provided.

Student focus groups

We will hold a focus group in each school with a group of around 5 pupils in Year 7. These will take place during or after the lessons. We will get opt-in parental consent for pupils to take part in the focus group and for the focus group to be recorded. A topic guide will be used to structure the focus group and will include experiences of projects, assessment and exhibitions; benefits to learning; what they found difficult to do; how PBL lessons compare to other lessons in school.

Head teacher/school leadership interviews

Semi-structured interviews will be used in talking to the head teacher of the school or an alternative school leader responsible. These interviews will be recorded with the permission of the participant. The interview schedule will cover school context, motivations for implementing the intervention, school organisational issues, PBL staffing and the support and training provided.

Teacher survey

An online teacher survey will be sent in June/July 2015 to all intervention teachers involved. This will explore teacher views of the intervention, how well they were able to implement the intervention, impact on pupils, any barriers faced and the support and training provided.

Pupil Survey

A pupil survey will be given to all intervention pupils at the same time as the outcome measures. This will be a short paper survey looking at whether pupils enjoy PBL, what they do in their lessons, the impact on other lessons in school and skills they think they are gaining.

Developers and intervention team

Contact will be maintained throughout the project period with the developer team and specific interviews/focus groups as described below will be conducted at different time points through the project.

Innovation Unit Project Lead

Interviews with the IU's project lead will take place at the preparation stage (just prior to the delivery of the intervention), at the end of the development year, and again in July 2015 at the end of the intervention delivery. These will use a semi-structured interview schedule with flexibility to explore other topics that are brought up during the discussion.

Classroom coaches

The High Tech High classroom coaches who provide training and support to schools will be interviewed during the development year. This will provide feedback on their roles, the key components of the intervention, how schools are implementing these, the barriers schools and teachers face and the training and support provided. In March 2015 during the main trial year we will hold a focus group with all four High Tech High coaches again to discuss how schools are implementing the intervention, the training and support provided, the barriers teachers face, and their roles in the project.

Leadership coaches

A focus group will also be held during March/April 2015 with the Leadership coaches who provide training and support to schools. This will focus on their role and how this supports schools, barriers/difficulties facing school leaders in delivering PBL, how the intervention has developed during the project, and the sustainability of the intervention in schools.

Case studies

Towards the end of the project period two schools will be identified where the intervention was perceived as being particularly successful, and those schools will be invited to contribute to in-depth case studies. These schools will be selected at the end of the intervention delivery year and case studies will be completed in September/October 2015.

Control school interviews

Telephone interviews will be conducted with leadership in control schools to investigate what these schools have been doing through the project (e.g. any PBL without IU support, other school change intervention). This will give some data on the counterfactual in the trial. This will coincide with discussion with the school about outcome assessment (around April 2015).

Key identified risks

Overall the risk associated with satisfactory completion of this project is low. A number of the risks have been highlighted below. In addition to this we will work closely with the IU team and EEF project manager to address any other issues as they arise.

Risk	Probability	Issues and how might be addressed
Not being able to recruit 24 schools in time for training and delivery in Sept 2014	Low	Both the developers (IU) and the evaluators (Durham / York) are well known and have a high credibility amongst schools which will aid recruitment. In addition schools are becoming more aware of EEF projects. The evaluators will support 'road show' events aimed at recruitment.
Intervention not fully developed or teachers not fully trained by Sept 2014	Low	We would expect it to be fairly clear by early 2014 if there were to be any major or significant issues surrounding the development of a final testable version of the intervention.
High attrition and loss to follow up	Low	Given the commitment to training and re-organisation, those that opt-in are likely to remain in. Some outcome data may well still be gained if any are lost. The evaluation team will work closely with the IU to ensure that any losses are at an absolute minimum, and outcome data is obtained from all participating schools.
Maintaining programme implementation fidelity	Medium	Given the complexity of the intervention there will be a greater risk to fidelity than simpler / less involved interventions. A measure of implementation fidelity will be included. Where appropriate the evaluation team will advise

		the IU on suitable strategies to assess implementation fidelity on an on-going basis.
Consent being refused	Low	This may be an issue in the pilot trial where parents may feel that the intervention is not suitable for their children, and schools may feel obliged to allow some cross-over. (This will not affect the final outcome data). However, this is unlikely to affect the main trial as all pupils in the year will be doing the intervention.
Operational risks – including, staffing, IT, assessment and data storage	Low	Both CEM and YTU are quite large organisations with considerable resources to draw upon, and both are within larger university organisations.

Ethics

Updated: Ethics approval has now been obtained for this trial so updated appropriately

Ethics approval for the intervention will be required, and we assume this will be sought by the developers following the EEF procedures. Approval has been gained from the School of Education Ethics committee for all elements of the evaluation as described in the protocol. Whilst the outcome testing will be routine testing involving all of the pupils in the relevant years, parents will be informed about the evaluation, and offered the opportunity for their children’s data not to be used in the analysis. Parents will also be informed about the group interviews and offered the opportunity for their children not to take part.

Anticipated roles of developer / implementer

- Recruitment of schools willing to support and facilitate the intervention, evaluation and the assessments
- Formalising and documenting the intervention and training
- Maintaining on-going liaison and contact with the schools
- Supporting as appropriate the process evaluation elements

Project team

Updated: Changes to staffing and roles have occurred since the inception of the project and these have been updated appropriately.

Victoria Menzies – is a researcher and trial coordinator at the CEM Durham, and will be the lead project researcher. Victoria will coordinate the trial, contribute to the process evaluation elements including observations, student and teacher focus groups and the case studies, and be the first author of the final report.

Andy Wiggins – is Associate Director of Research and Evaluation at CEM Durham. He will lead and coordinate the project, including maintaining links with the development and intervention partnership (IU) and the EEF. He will contribute to the process evaluation.

David Torgerson – is Professor and Director of the York Trials unit. He will lead the York team, and have primary responsibility for the design of the pilot and main trials.

Julian (Joe) Elliott – is Professor of Educational Psychology and Principal of Collingwood College. He will contribute to the literature review and provide advice on pedagogic issues.

Catherine Hewitt – is a senior statistician from the York Trials Unit. She will contribute to the design of the pilot and main trials and lead the data analyses.

Christine Merrell – is Director of Research and Development at CEM Durham. She will advise and lead on the identification and deployment of the measures and outcome indicators.

Dimitra Kokatsaki – is a lecturer in the schools of education and researcher at CEM. She will carry out the literature review.

Clare Collyer – is a trial administrator at CEM. She will maintain contacts with the schools and provide research and administrative support throughout the project period including responsibility for the NPD and assessment data.

Timeline

Updated: changed timeline to reflect changes described above.

Activity / Milestone	Date
Project Start	Jan 2013
School recruitment conference for pilot trial	Apr 2013
Literature review	May 2013
Pilot Trial begin	Sept 2013
School recruitment main trial	Nov 13-Jan 2014
Randomisation main trial	Jan 2014
Initial observations of training	Mar/Jun 2014
Outcome measures pilot trial	Jul 2014
Intervention phase 1 begins	Sept 2014
School interviews and Classroom observations 1	Feb-May 2015
Outcomes testing main trial	Jun-Jul 2015
School interviews and Classroom observations 2	Jan-Mar 2016
Final Report	May 2016
Dissemination event	Sept 2016