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Evaluation of Thinking, Doing, Talking Science in primary schools

Submission date
07/12/2021

Recruitment status
No longer recruiting

Registration date
20/01/2022

Overall study status
Completed

Last Edited
06/10/2025

Condition category
Other

[_] Prospectively registered
[X] Protocol
[X] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol
Background and study aims
This study aims to evaluate a science-related continuous professional development (CPD) programme (Thinking, Doing, Talking Science - TDTS) delivered to Year 5 primary school teachers. The impact on pupil science attainment and attitudes towards science will be measured.
TDTS training enables teachers to help pupils think and talk about scientific concepts in every science lesson, through dedicated discussion slots (the Bright Ideas Time) linked to the topic being taught. Teachers will encourage their pupils' thinking through practical science, giving them frequent opportunities for creative investigations and problem-solving. It is expected that this will improve pupils' thinking skills leading to better science attainment and greater pupil engagement.

Who can participate?
State-funded primary schools in six regions of England that will allow all their Year 5 teachers to attend the TDTS CPD sessions.

What does the study involve?
Participating schools will be randomly allocated to either the intervention group, where they will receive the TDTS programme, or to the control group, who will continue to teach science as usual for the duration of the evaluation. From September 2022, the Year 5 teacher(s) in the intervention schools will receive the TDTS CPD, which involves five sessions across the year and access to online resources.
This study runs across 2 years. The first group of Year 5 pupils (starting Year 5 in September 2022) will complete a science assessment and an attitude survey at the end of the first year. At the end of the second year, the second group of Year 5 pupils (starting Year 5 in September 2023) will complete the same measures. The first cohort of Year 5 pupils, now in Year 6, will complete a different, age-appropriate science assessment. Schools will be encouraged to ensure that the same teachers will be retained in Year 5 for both years of the evaluation wherever possible: the TDTS training will only be delivered during the first year.

What are the possible benefits and risks of participating?
Possible benefits include improving the thinking skills of participating children, particularly in

relation to science, and their attitudes to science. The skills and confidence of participating teachers may also be enhanced. There is a very low risk of the children being upset by completing the assessments, but this risk will be lessened by the assessment taking place in a familiar environment (the classroom) with their classmates and a known member of staff present.

Where is the study run from?
University of York (UK)

When is the study starting and how long is it expected to run for?
October 2019 to July 2024

Who is funding the study?
Education Endowment Foundation (UK)

Who is the main contact?
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Contact information

Type(s)
Public

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Additional identifiers

Protocol serial number
R2239501

Study information

Scientific Title
Independent evaluation of Thinking Doing Talking Science (TDTS) in primary schools: a two-armed cluster randomised controlled trial (second re-grant)

Acronym
TDTS

Study objectives
That the Thinking Doing Talking Science (TDTS) programme will enhance teachers' delivery of science lessons, leading to improvement in pupils' (a) science attainment and (b) attitudes to science.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 15/05/2020, University of York Health Sciences Research Governance Committee (Department of Health Sciences, Department of Philosophy, Heslington, York, YO10 5DD, UK; +44 (0)1904323253; smh12@york.ac.uk), ref: HSRGC/2020/391/C

Primary study design
Interventional

Study design
Two-armed cluster randomized controlled trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Science CPD for Year 5 primary school teachers and science attainment and attitudes in Year 5 and Year 6 pupils

Interventions
An independent trial statistician at the University of York will conduct randomisation at the school level using a 1:1 ratio to the following trial arms:
1. The intervention arm will receive the TDTS CPD programme. This course aims to enable Year 5 teachers to adapt their pedagogy to plan and teach creative science lessons that overtly encourage their pupils' higher order thinking and involves face-to-face training, paper and online resources.
2. The control arm will continue with their usual provision for the duration of the evaluation.

The TDTS intervention will run from September 2022 to July 2023. The TDTS course includes four 1-day continuing professional development sessions of in-person training and access to hard copies of materials and online resources. A further half-day of training later in the academic year will share good practice and provide advice on disseminating TDTS within their schools. Two cohorts of Year 5 pupils will be measured using a Year 5 science test towards the end of the academic year: cohort one (Year 5 in 2022/23) and cohort 2 (Year 5 in 2023/24). Attitudes to science surveys will be used with both cohorts as well as post-intervention surveys with school staff. There will be no further training provided in the second year but access to online resources will be available. An age-appropriate science test may also be administered towards the end of Year 6; this is subject to discussion after analysis of the first year of data.

Intervention Type
Behavioural

Primary outcome(s)
Attainment measured using the Year 5 Science Assessment, developed by the Centre for Industry Education Collaboration (CIEC) and York Trials Unit (YTU), University of York, administered to Cohort 1 in June-July 2023

Key secondary outcome(s)

Science attitudes of pupils measured using Science Attitudes Questionnaire in June/July 2023

Completion date
12/07/2024

Eligibility

Key inclusion criteria
1. The school must be state-funded
2. Participants in the professional development programme are Year 5 teachers; for the primary outcome measure, participants are Year 5 pupils (aged 9-10 years)
3. The school must have a minimum of one full class of Year 5 pupils (mixed year group classes will not be eligible to take part). 4. The school will allow all Year 5 teachers to be available for the 4.5 days of training. If a school only has one Year 5 teacher, another teacher (ideally the science co-ordinator) would also need to attend the training
5. The school agrees to all requirements outlined in the Information for Schools and Memorandum of Understanding (MoU) documents (including commitment to keep same Year 5 teachers across the 2 years wherever possible)
6. Schools within a multi-academy trust (MAT) will be eligible to participate on the understanding that schools within the same MAT must agree that they either do not usually, or will not during the period of the trial, collaborate on science teaching

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Child

Lower age limit
9 Years

Upper age limit
10 Years

Sex
All

Total final enrolment
14124

Key exclusion criteria
1. The school does not operate a 2-year science curriculum that involves Year 5 pupils (i.e. either Year 4/Year 5 or Year 5/Year 6)
2. The school or individuals involved have not been involved in the previous trials of TDTS, been trained in TDTS or taken part in the pre-trial. If the school is part of a MAT then none of the schools within the MAT has taken part in the pre-trial
3. The school is not involved in the EEF Stop & Think trial

4. The school has not been involved in the EEF Focus for Teacher Assessment of Primary Science (Focus4TAPS)

Date of first enrolment
03/01/2022

Date of final enrolment
28/06/2022

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
York Trials Unit
Department of Health Sciences
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Study participating centre
Science Oxford
Stansfeld Park
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Sponsor information

Organisation
University of York

ROR
https://ror.org/04m01e293

Funder(s)

Funder type
Charity

Funder Name
Education Endowment Foundation

Alternative Name(s)
EducEndowFoundn, The Education Endowment Foundation (EEF), Education Endowment Foundation | London, EEF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from the EEF data archive managed by the Office for National Statistics. Consent will be sought from participants for data to be stored in the EEF data archive.
Type of data stored:
1. Anonymised project data
2. A standardised dataset including pupil identifiers with fields renamed or recoded to support secondary analysis
3. A copy of the draft evaluation report to help validate the data and any other documents or materials to support secondary analysis
4. Syntax or Do files
5. A submission form listing the filenames and declaring the legal basis for processing
The pupil-level impact evaluation data generated and/or analysed during the current study will be deposited in the EEF Data Archive managed by FFT Education (Fischer Family Trust) and held within the Secure Research Service offered by the Office of National Statistics. Education Endowment Foundation will act as the data controller for the archive, the archive does not contain any information that can be used to directly identify an individual pupil. For example, the archive does not include names, addresses or dates of birth. The archive does contain the Pupil Matching Reference (PMR) which is an identifier used by the Department for Education to enable the linking of archive data to the NPD. Data should be available in the repository 1 month after submission of the final report. Enquiries to the EEF Data Archive can be made via data.sharing@education.gov.uk.

IPD sharing plan summary

Stored in non-publicly available repository, Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Funder report results		01/06/2025	09/09/2025	No	No
Funder report results	Addendum report		06/10/2025	No	No
Participant information sheet	version 0.3	04/01/2022	19/01/2022	No	Yes
Participant information sheet	version 1.0	13/09/2022	17/01/2025	No	Yes
Participant information sheet	version 1.0	04/09/2023	17/01/2025	No	Yes
Protocol file	version 1.1		17/01/2025	No	No
Statistical Analysis Plan			17/01/2025	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes