Education Endowment Foundation

The impact of Feedback Approaches on educational attainment in children and young people

Protocol for a Systematic Review: Post- Peer review

December 2020

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Background and review rationale

Feedback is an area of teaching and learning that is a central priority for teachers and may have the potential to substantially improve outcomes for pupils. Feedback can be defined as information communicated to the learner that is intended to modify the learner's thinking or behaviour for the purpose of improving learning[1]. Meta-syntheses (i.e a synthesis of meta-analyses, for example, the EEF Teaching and Learning Toolkit) have reported positive impacts of feedback, with effect sizes ranging from d = 0.70 to d = 0.79 for student achievement at various points in time and stages of education[2]. The EEF Teaching and Learning Toolkit meta synthesis suggests that feedback may have "very high" impact (equivalent to 8 months additional progress) for relatively low cost. However, while the average impact of feedback may be high, the range of impacts may also be very wide. First, the average effect size reported in the EEF Toolkit is based on combining the estimates from existing meta-analyses of individual studies, which may contain limitations of various kinds (see the list below) that may mean that average effect sizes identified are overestimates. Second, some studies (such as Kluger and DeNisi's seminal meta-analysis[3]) suggest that some feedback interventions may, in fact, negatively impact pupils. Third, previous meta-syntheses have not explored in detail the impacts of potential moderating factors such as different types of feedback or contexts. Preliminary investigation of studies included in the different meta-analyses by the review team also identified that they include a range of practices described as feedback and studies where feedback is only one component of a practice intervention.

A recent meta-analysis of feedback[4] produced a weighted average effect size of d = 0.55. In this meta-analysis, 17% of the effect sizes from individual studies were negative. The confidence interval ranged from d = 0.48 to d = 0.62 and the authors found a wide range of varying effect sizes. Different moderators were also investigated to explore the impact of different characteristics of context and feedback. Whilst this meta-analysis offers improvements over previous meta-syntheses, it has a number of limitations including:

- It only included studies drawn from 36 existing meta-analyses, the most recent of which was published in 2015. Eligible studies published after 2015 or not included in these meta-analyses would not have been included.
- All comparative study designs were included. Less robust study designs may have over-estimated the positive effect of feedback.
- There was no reported study quality assessment / moderation / or sensitivity analysis which may have led to an overestimation of the pooled effect sizes.
- The meta-analyses included studies with high levels of heterogeneity $I^2 = 80\%$ + (in the main and moderator analysis). This suggests that the synthesis may be combining studies /comparing feedback practices inappropriately.
- The meta-analysis did not consider all potentially relevant moderating factors. It may also be the case that the impact of feedback depends on factors other than those analysed, including the ability of the learner, the learning context, the frequency, duration, timing and type of feedback.

This systematic review is being conducted at the request of the EEF to provide more accurate and precise estimates of the impact of feedback. The review will examine the effects of different types of feedback, in different contexts and for different learners with a greater degree of transparency than is

[1] Shute VJ (2007) *Focus on Formative Feedback*. Research Report RR-07-11. Princeton NJ. Education and Testing Service
[2] Hattie, J. (2009). *Visible Learning: A Synthesis of 800+ Meta-Analyses on Achievement*. London: Routledge; Hattie, J., and Timperley, H. (2007). The power of feedback. *Rev. Educ. Res*. 77, 81–112; Hattie, J., and Zierer, K. (2019). *Visible Learning Insights*. London: Routledge
[3] Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254–284
[4] Wisniewski B, Zierer K and Hattie J (2020) The Power of Feedback Revisited: A Meta-Analysis of Educational Feedback Research. *Front. Psychol*. 10:3087

currently available via the EEF Teaching and Learning Toolkit strand on 'Feedback'. For EEF, the purpose of the systematic review is to provide evidence that can be used to inform guidance for teachers and schools about effective feedback practices.

The systematic review protocol is being developed in consultation with the team at Durham University who are undertaking the EEF Database project with a view to acting as a model for further systematic review 'updates' of the other strands in the Teaching and Learning Toolkit. The EEF database team has completed a process of screening the individual studies that are included in the meta-analysis that provided the evidence base for the Feedback Strand of the EEF Teaching and Learning Toolkit. This group of studies provided the initial framework for the development of this 'Feedback Approaches' systematic review protocol which has evolved as the scope and scale of the research on feedback became more apparent.

Domain being studied: Feedback Approaches

This review focuses on interventions that provide feedback from teachers to learners, in mainstream educational settings for 3-18 year olds. Feedback is defined in accordance with the EEF toolkit definition,

> *'Feedback is information given to the learner and/or teacher about the learner's performance relative to learning goals or outcomes. It should aim to (and be capable of) producing improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome. It can be about the output of the activity, the process of the activity, the student's management of their learning or self-regulation, or them as individuals. This feedback can be verbal or written or can be given through tests or via digital technology. It can come from a teacher or someone taking a teaching role, or from 'peers'.*

This initial broad definition, whilst conceptually coherent, does create challenges both in practice for teachers and in terms of identifying and distinguishing between practices when considering research evidence. For example, what is the difference between small group learning and 'peer feedback'?. It seems perfectly reasonable to assume that small group learning must contain conversations between students about their work and the task they have been asked to complete and thus is 'feedback'. However in practice this may not be what teachers think of as 'feedback' and in the research literature 'small group learning' is investigated both as a unique pedagogical strategy and as a component of a number of other pedagogical strategies.

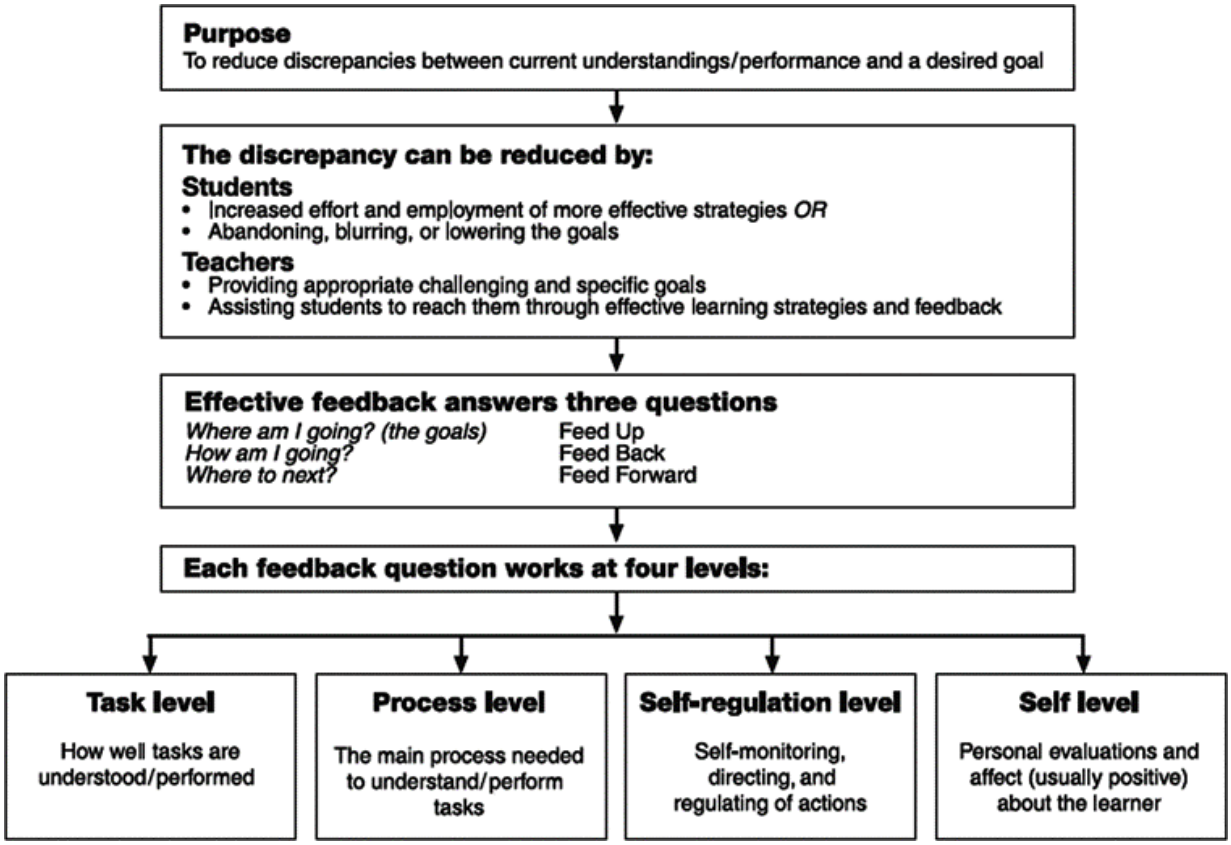
As the development of the understanding of the scope of the review evolved then the working definition of feedback for the review became modified practically through the exclusion of certain categories of intervention even though they may contain an element of feedback practice. These can be seen in the review selection criteria below.

Conceptual Framework/Theory of Change

There are several ways in which feedback is conceptualised as improving learner performance i.e. as a Theory of Change. The EEF 'Feedback' strand in the Teaching and Learning Toolkit draws most explicitly on the conceptualisation of Hattie and Timperley's (2007) model (see figure 1 above) which emphasizes the importance of systems of feedback whereby the teacher provides feedback to the specific needs of individual students. The searching, selection and coding processes outlined in this review are consistent with this approach. However they do not preclude the inclusion of studies that may draw on other 'models' of feedback which though similar to Hattie & Timperley (2007) may be argued to place more emphasis on, for example; developing learner self-regulation (Nicole &

Macfarlane-Dick 2006) ; students' intrinsic motivation (Dweck 2016); and/or are subject specific e.g. 'Thinking Mathematically' (Mason, Burton & Stacey 2010) .

Figure 1: Hattie and Timperley Feedback model



Review design

A systematic review approach, using explicit, accountable and rigorous research methods will be applied.[5] The review will be undertaken in two stages. First, a systematic map will identify and characterise studies that investigate the attainment impacts of feedback. This descriptive map will provide information about the specific interventions, contexts, types of outcomes and study designs used in this body of literature. The map is useful to clarify the extent and nature of research undertaken to investigate the quantitative impact of feedback on student academic attainment. It also enables reviewers and other stakeholders to make decisions about focusing the analysis in the second in-depth systematic review stage and can provide contextual information to support interpretation of the evidence[6]. Second, an in-depth review, including meta-analysis, will be performed to answer the review questions and explore the variety of intervention and context characteristics that may influence the impact of feedback on attainment.

[5] Newman M & Gough D (2020) Systematic Reviews in Educational Research: Methodology, Perspectives and Application. In Zawacki-Richter O et al. (eds.) *Systematic Reviews in Educational Research*. Springer Verlag. Wiesbaden
[6] Sutcliffe, K., Oliver, S., and Richardson, M (2017) Describing and analysing studies in Gough, D., Oliver, S., and Thomas, J (Eds) *An Introduction to Systematic Reviews*. 2nd Edition. Sage.

EPPI Reviewer, specialist software for systematic reviews, will be used for each stage of the review process. This platform enables the management, storage and analysis of studies included in the review, whilst documenting all processes.[7]

Objectives

Systematic Map Research Question:

What are the characteristics of the research using counterfactual designs measuring the attainment impacts of feedback interventions/approaches?

Preliminary Systematic Review Research Question:

What is the difference in attainment of learners, aged 3-18 years old, receiving a specific feedback intervention/ approach in comparison to learners receiving 'the usual treatment' (with regard to feedback practices in the setting)/ no feedback or an alternative approach?

The systematic review will attempt to explore, through subgroup or moderator analysis, questions about a variety of factors that may influence the impact of feedback on attainment including but limited to the following:

Does the impact of feedback vary depending on:

- The source of feedback (e.g. Teacher, TA, peer, digital, self)
- Whether feedback is given to the individual student or to a group (e.g. class)
- How the feedback is delivered e.g. verbal, non-verbal, written and verbal, written and non-verbal).
- When the feedback is provided (e.g. prior, during, immediate, delayed (short), delayed (long))
- The tone of the feedback (positive, negative, neutral)
- The content of the feedback (e.g. about outcome, process, the person, their strategies)
- Providing feedback on correct answers or incorrect answers
- Providing grades/ scores alone
- The characteristics of the learners e.g. age, phase of schooling, gender, disadvantage, level of prior attainment
- Characteristics of the subject e.g. Maths, Science, literacy

Where studies comment on the impact of feedback on workload, or if they comment on how an effective feedback intervention was successfully implemented, these will either be flagged by the review team for the EEF to explore, or the review team will synthesise these comments (this will depend on the time available to the review team after the evidence mapping stage).

[7] Thomas J, Brunton J, Graziosi S (2010) *EPPI-Reviewer 4: software for research synthesis*. EPPI-Centre Software. London: Social Science Research Unit, UCL Institute of Education

Methodology

Inclusion and exclusion criteria for the review

The inclusion criteria are set out below. These selection criteria are those used in the EEF Database project. The criterion for 'feedback intervention' have been developed for this project based on the EEF Database project definition of feedback above. There are no restrictions on the eligibility of studies to be included in the review beyond those described in the table, i.e. empirical research studies published in any format from anywhere in the world investigating any kind of feedback can be included providing all other criteria are met.

Table 1: 1st Stage Systematic map selection criteria

Inclusion criteria	Included	Excluded
Population	The majority of the sample (>50%) on which the analysis is based are learners or pupils aged between 3-18 (further education or junior college students are be included where their study is for school level qualifications).	The majority of the sample are: post-secondary education; in higher education; adults; infants under 3; other students over 18.
Intervention	*an educational intervention or approach, recognisable as Feedback that aims to help the learner improve their performance: I) Source: Feedback can be provided by a teacher or person acting in the teaching role (such as Teaching Assistant), parent/carer or other family members, or peers. Feedback can be digital or otherwise automated or generated by the learner. II) Form: Feedback can take the form of spoken, written or non-verbal statements III) Kind: Feedback can focus on the learner's academic performance/ outcome, the process, the learner's strategies/ approach or about the learner. Feedback includes praise and rewards.	Intervention or approach is not recognisable Feedback i)Consists of only feedback on Behaviour ii) student performance data given only to the teacher iii) The study/intervention is Mastery Learning iv) The study intervention is Tutoring v) The study intervention is some kind of learning strategy vi) the study intervention is aimed at developing metacognition /self-regulation
Setting	The intervention or approach is undertaken in a mainstream educational setting or environment for the learners involved, such as a nursery or school or a typical setting (e.g. an outdoor field centre or museum).	i) Laboratory studies. Children are removed from classroom or school to a Specially created environments (both physical and virtual). ii) The setting is EFL/ESL learning outside the UK
Comparison	Receiving 'treatment' as usual, no feedback or an alternative intervention	No Comparison
Study Design	A valid (see exclusion criteria) counterfactual comparison between those receiving the Feedback	Single group and single subject designs where there is no control for maturation or growth.

	intervention or approach and those not receiving it.	
Outcomes	Assessment of educational or cognitive attainment /achievement which reports quantitative results from testing of attainment / achievement or learning outcomes such as by standardised tests or other appropriate curriculum assessments or school examinations or appropriate cognitive measures.	No quantitative outcomes measured Purely qualitative outcomes
Language	English only	Not published in English
Publication Date	Post 1960**	Prior to 1960

*Review specific based on EEF database definition of feedback given above.

** The EEF Teaching and Learning Toolkit Database currently does not contain any studies before 1960. On this basis we have selected this cut-off date for selection.

Search strategy for identification of studies

Initial strategy

We will use a novel, semi-automated method to identify eligible studies for this review, enabled by an automated search of the *Microsoft Academic Graph* (*MAG*) dataset[8] , which is hosted in *MAG Browser* – a new suite of tools in *EPPI-Reviewer*[9] (see below for further details). The *MAG* dataset currently comprises approx. 240 million bibliographic records of research articles from across science, connected in large network graph of conceptual and citation relationships. *MAG* records include abstracts and (often multiple) links to online full-text sources, when available.

We also initially intended to conduct a conventional electronic search of the *ProQuest Dissertations and Theses Global* database. This decision was based on a provisional finding (from our ongoing research and development) that a subset of study reports in the *EEF Education Evidence Database* encompassing a set of 'known includes' eligible for the current review that were originally identified by searching ProQuest (i.e. dissertations and theses) are not included in the *MAG* dataset; representing a major gap in coverage of the *MAG* dataset with respect to the current use scenario.

We also intended to conduct forwards and backwards citation searches (using *MAG Browser*, linked to academic.microsoft.com, when possible), 'seeded' by 'includes' (full-text decision) identified from *MAG* or *ProQuest*. Similarly, we intended to search lists of 'related publications' (using *MAG Browser*), again 'seeded' by 'includes' (full-text decision). Microsoft has analysed the large number of different ways in which research articles (MAG records) can be related to one another within the MAG dataset; and has created a 'composite' of these relationships known as the 'related publications' feature. Each record in the MAG dataset has 20 linked 'related publications' (MAG records) and each of these will be examined for the current review. Finally, we had intended to contact topic experts to identify any further potentially eligible studies.

Other 'known gaps' in coverage of the MAG dataset with respect to the current use scenario are: (a) conference abstracts (not always indexed in *MAG*); and (b) other types of grey literature (i.e. other than dissertations and theses – not always indexed in *MAG*). Education research is a broad field and

[8] Sinha A, Shen Z, Song S, Ma H, Eide D, Hsu B-J, Wang Kuansan. An Overview of Microsoft Academic Service (MA) and Applications. In Proceedings of the 24th International Conference on World Wide Web (WWW '15 Companion): 243-246. ACM, New York, NY, USA. 2015.
[9] Thomas J, Graziosi S, Brunton J, Ghouze Z, O'Driscoll P, Bond M (2020) EPPI-Reviewer: advanced software for systematic reviews, maps and other evidence synthesis.

'Feedback' is a broad concept. Thus education (including 'Feedback') research is reported at many different conferences and meetings globally. Also, conference proceedings in the field are typically not easily accessible or available for electronic searching. Similarly, education research is commissioned and/or funded by a wide range of government and third sector institutions internationally; and it is reported and published in a variety of publication formats (e.g. interim and final reports, (other) documents on the internet, or webpages). We therefore judge that any systematic attempt identify further eligible study reports published as (a) conference abstracts and/ or (b) other types of grey literature would be highly resource intensive, with an expected low yield of additional eligible studies. Therefore, we do not plan to conduct any supplementary searches for these two specific types of publication.

Our initial search strategy included five strands:

1. An automated electronic search of the *MAG* dataset;
2. A conventional search of the *ProQuest Dissertations and Theses Global* database;
3. Forwards and backwards citation searches;
4. Related publications searches; and
5. Contacting experts.

Revised search strategy

The results of the MAG database search and initial screening yielded a high number of potential study includes (see further details below). We have therefore only included the automated electronic search of the MAG dataset.

Microsoft Academic Graph (MAG) dataset

A corpus of n=144 unique study reports ('known includes') eligible for this systematic review were identified by the team based at the University of Durham that is currently establishing the *EEF Education Evidence Database*. Of these, n=133 study reports have been automatically or manually matched to n=132 corresponding MAG records (in one instance n=2 study reports were matched to n=1 MAG record). As part of our wider ongoing research and development on the use of *MAG* for maintaining the *EEF Education Evidence Database*, we have also matched (to their corresponding *MAG* records when available) all study reports 'unzipped' from meta-analyses in the 'Feedback strand' of the *EEF Toolkit* (n=1,025 *MAG*-matched records, of which n=133 are 'known includes' eligible for current review); and all study reports 'unzipped' from meta-analyses in six 'strands' of the *EEF Toolkit* (n=2,066 *MAG*-matched records, of which n=1,025 were 'unzipped' in the 'Feedback strand').

Building on the three overlapping corpuses of eligible '*MAG*-matched' study reports described above, we will further develop and test (by undertaking a preliminary retrospective simulation study) a semi-automated study identification workflow, powered by the *MAG* dataset and hosted in EPPI-Reviewer[10] [11]. This retrospective simulation study will serve to:

I. Evaluate options for generating 'MAG network graphs', based on:
   a. Three different sets of 'seed' ('MAG-matched) records (described above); and
   b. 'One-hop' ('proximal') and 'two-hop' ('extended') networks (citation and/or 'related publications' relationships)[12] ; and

[10] Shemilt I, Thomas J. MAG-Net-ise it! How the use of Microsoft Academic Graph with machine learning classifiers can revolutionise study identification for systematic reviews. Oral paper accepted for presentation at the 26th Cochrane Colloquium, Santiago, Chile, 22-25 October 2019.
[11] Thomas J, Graziosi S, Brunton J, Ghouze Z, O'Driscoll P, Bond M (2020) EPPI-Reviewer: advanced software for systematic reviews, maps and other evidence synthesis.
[12] Shemilt I, Thomas J. MAG-Net-ise it! How the use of Microsoft Academic Graph with machine learning classifiers can revolutionise study identification for systematic reviews. Oral paper accepted for presentation at the 26th Cochrane Colloquium, Santiago, Chile, 22-25 October 2019.

II. Simulate precision and screening workload (using 'priority screening' mode in EPPI-Reviewer – see 'Selection of studies' below) at pre-specified threshold levels of recall among 'target' records.

In all evaluated options, the 'target' set of MAG-matched records will be specified as those published from 2007 onwards (i.e. this study will retrospectively simulate an update of the current systematic review from the start of 2007 up to the end of 2018).

For prospective deployment, the final MAG-enabled workflow will be specified with those options expected to maximise recall whilst also keeping screening workload manageable within available resources. We will then prospectively deploy this workflow to automatically identify and select further 'new' (i.e. previously unseen), candidate, potentially eligible study reports (MAG records) and their corresponding full-texts for manual screening against our eligibility criteria. Study reports (MAG records) published before 1960 will be excluded from the 'MAG-enabled workflow' before the records enter the 'priority screening' workflow.

Screening

Initial screening strategy

A screening training and moderation exercise will be carried out whereby the EPPI-centre team 'rescreen' a random selection of the studies included and excluded by EEF database team at Durham. Screening will be undertaken by all members of the review team. Each study will only be reviewed by one member of the team. A sample of studies will be double screened by two independent reviewers.

Manual screening of records retrieved from the MAG dataset will be conducted using 'priority screening' mode in EPPI-Reviewer. 'Priority screening' mode utilises 'active learning', which involves periodic automatic reprioritisation of the rank-ordered lists of 'new' candidate records by a machine learning classifier, based on all preceding title and abstract eligibility screening decisions made by the researchers (also 'seeded' by our corpus of 'known includes') in each workflow[13]. In the MAG-enabled workflow, we will screen a minimum number of records, based on results of our retrospective simulation study.

Revised screening strategy

The MAG search identified 23,725 potential studies for screening. The retrospective simulation study estimated that approximately 5000 of these would need to be screened to identify all the studies meeting the review selection criteria.

We also monitored the screening using 'screening progress' graph in EPPI-Reviewer, to inform a pragmatic decision about when to truncate screening (within available resources). The title and abstract screening was initially paused after 3020 studies had been screened and 745 potentially includable studies had been identified for full text screening.

Our searching and study selection processes will be recorded using a PRISMA flow chart (see appendix 1).

In the case of identifying multiple publications reporting the same study, EPPI Reviewer will 'link' all associated reports or documents. This process allows the reviewers to designate one publication the primary report and draw on subsidiary publications, if necessary, in preparation for the coding and synthesis stages of this review.

[13] O'Mara-Eves A, Thomas J, McNaught J, Miwa M, Ananiadou S (2015) Using text mining for study identification in systematic reviews: a systematic review of current approaches. Systematic Reviews 4:5. doi:10.1186/2046-4053-4-5

Data extraction for the systematic map

The review team will undertake a coding moderation exercise prior to undertaking any coding where all of the team code the same studies and compare results.

The full text screening identified 304 studies to include in the systematic map. The first stage of coding coded the studies for whether the intervention was feedback (or variations of feedback) only or feedback and other components. The second stage of coding for the map was carried out on the 171 studies that were feedback only. These studies were coded on the following characteristics

- The Educational setting
- What was the source of the feedback?
- Who was the feedback directed to?
- What form did the feedback take?
- When did the feedback happen?
- What kind of feedback was provided?
- What was the emotional tone of the feedback?

Stage 2 in depth review

Once the Evidence Map was presented to the EEF, the review team and EEF discussed the focus of the in-depth review.

Given the large number of studies, a pragmatic decision was taken in order to complete the review within resource constraints. We will, therefore, carry out in-depth data extraction on studies published post-2000, in which the sources of feedback are teacher, researcher and/or digital/automated feedback.

The research question for the in depth review is:

What is the difference in attainment of learners, aged 5-18, receiving a feedback intervention/ approach from a teacher/ researcher/ digital/ automated source in comparison to learners receiving 'the usual treatment' (with regard to feedback practices in the setting)/ no feedback or an alternative approach?

Stage 2 selection criteria

Following the pragmatic decision mentioned above, studies will be included at stage 2 if:

- The source of feedback is either the teacher, researcher or digital/automated
- The study takes place in mainstream setting among 5-18 year olds
- The study was published after 2000

Data extraction for the in depth review

Full review papers that meet this inclusion criteria (all of which will also meet the stage one selection criteria(Table 1)) will be coded using EEF's Teaching and Learning Toolkit general and quantitative outcomes coding frame and the EEF's Teaching and Learning Toolkit Feedback coding frame (see appendix 2). Small amendments may be made to this coding frame. For instance, with regards to digital and automated studies, we will also add a code to separate studies that use digital tech, and studies where teachers use automated resources (e.g booklets).

This coding will be carried out on the EPPI-reviewer systematic review software tool. We will adopt the EEF Teacher toolkit approach for the assessment of risk of bias/ quality of included studies. The risk of bias assessment will be used in the development of findings as part of a grading of recommendations.

Data Synthesis

We will carry out a quantitative synthesis using statistical meta-analysis. The specification of the meta-analysis will be set out in the final report, including methods for the investigation of heterogeneity, plans for moderator and sensitivity analysis. Subgroup and exploratory analysis will be undertaken as appropriate to address the various sub-questions about the type, context, and mechanism of feedback.

Reporting

The findings of the review will use the EEF's Systematic Review Report Template, which draws on the Campbell Collaboration MECCIR conduct and reporting standards for intervention reviews documents (The Methods Coordinating Group of the Campbell Collaboration, 2019). The review will therefore follow the following structure (see the template for further detail on each section):

- Background and review rationale
- Objectives
- Search results (and results of the descriptive map)
- Results of the in depth review, which will include as a minimum:
    - Definitions
    - Description of the evidence base
    - Findings (describing the analysis undertaken, including summary of findings tables, and a discussion of the results)
    - A synthesis of messages relating to workload and implementation (see objectives section above)
    - Relevance of the evidence base
    - Gaps in the evidence base
    - An overall evidence statement
- Implications
    - Implications for practice
    - Implications for research
- Limitations

The 'Results of the in depth review' section may be repeated for each research question or areas of research questions, and this decision will be made once analysis is completed. Considerable detail will also be reported on review methodology, including all sections listed in Appendix 1 of the EEF's Systematic Review Report Template.

Implications will be discussed with the EEF Guidance Report Panel, who will use the review to produce recommendations for an EEF Guidance Report on Feedback, to be published in June 2021.

The review protocol will registered on the Open Science Framework registry and we will explore the possibility of registration with the Campbell Collaboration Library of Systematic Reviews.

Personnel

Dr Mark Newman (EPPI-Centre, UCL Institute of Education). Mark will lead the project and systematic review team.

Dr Karen Schucan Bird (EPPI-Centre, UCL Institute of Education) – Co-investigator

Irene Kwan (EPPI-Centre, UCL Institute of Education) – Co-investigator

Dr Mary Richardson (Dept of Curriculum Pedagogy and Assessment, UCL Institute of Education) Co-investigator will lead the scoping review.

Dr Hui-Teng Hoo – Nanyang Technological University Singapore, Development Associate

Ian Shemilt (EPPI-Centre, UCL Institute of Education) will lead the development of the MAG workflows

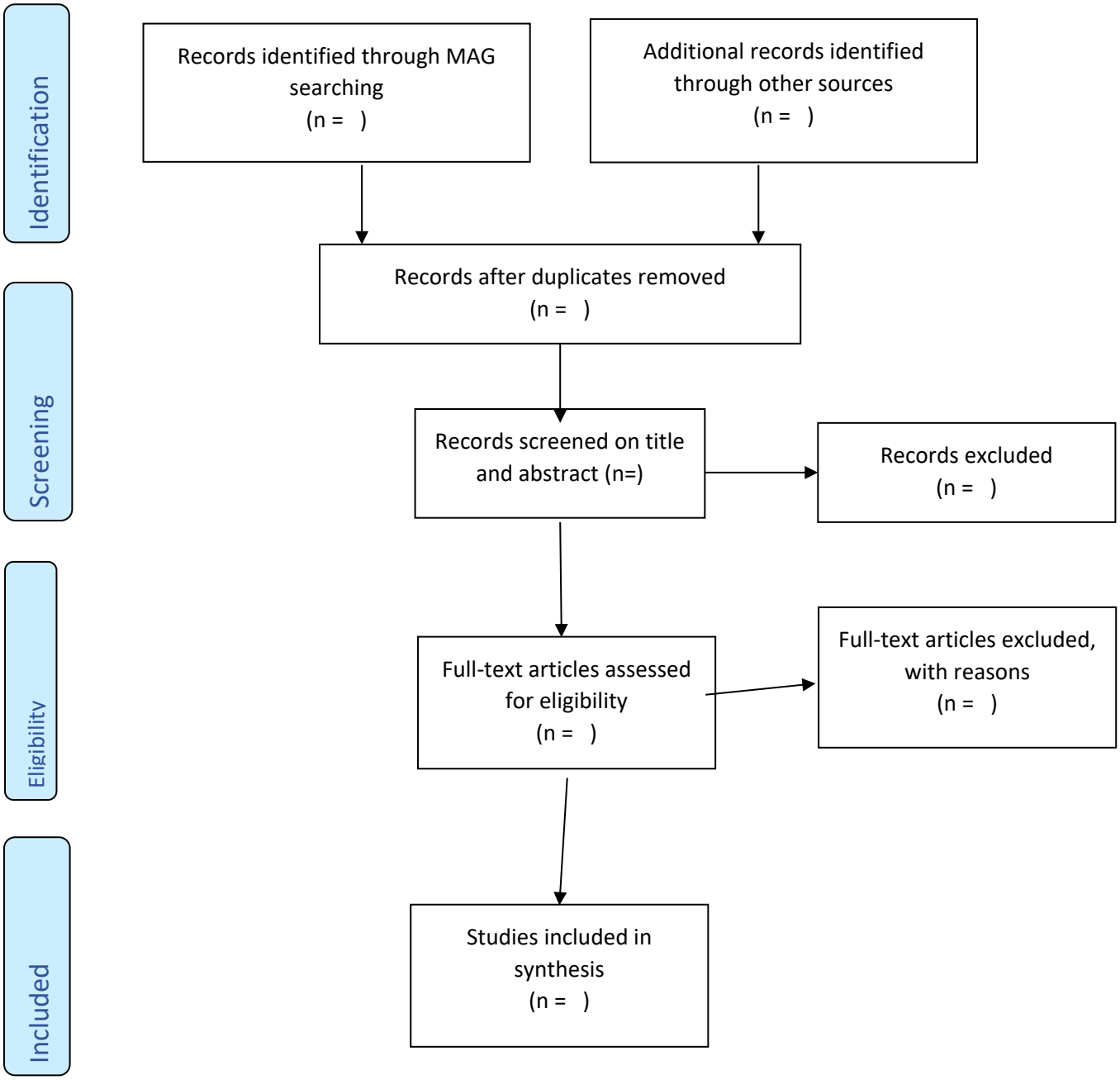
Conflicts of interest

The team members are all members of staff at University College London. Dr Hoo is a member of staff at Nanyang Technological University, Singapore. They are not in receipt of personal or research funding from any third parties relevant to this review or topic. They are not in receipt of any other funding from EEF. None of the team have published academic research directly on the topic of feedback. EPPI-Centre collaborates with Microsoft on the developmental use of MAG for systematic reviews but receives no funding from Microsoft.

Timeline

Dates	Activity	Staff responsible/ leading
16 July 2020	Set up, scoping and planning. Attend set up meeting, conduct scoping review, and provide EEF with a draft scoping review and draft protocol.	Mark Newman & Mary Richardson
30 October 2020	Completion of systematic 'map'. Conduct searches according to the pre-agreed search strategy, and produce evidence map. Meet with EEF to discuss which areas of the evidence map will be the focus of in depth coding and reporting. An updated protocol will be produced to reflect this.	Mark Newman, Karen Schucan Bird, Irene Kwan, Ian Shemilt
5th March 2021	Extraction, Analysis and synthesis. Extract data from the studies in the chosen area of focus. Analyse and synthesise this data and produce a final draft of the review.	Mark Newman , Karen Schucan Bird, Irene Kwan, Mary Richardson
7th June 2021	Guidance Report support and Database project liaison. Attend a panel meeting to present the review and discuss recommendations. Comment on drafts of the guidance reports as they are produced. Liaise with the Database team to ensure that studies and coding have been shared.	Mark Newman, Mary Richardson

Appendix 1 EEF Feedback Review PRISMA Flow Diagram



Appendix 2: EEF Feedback Review Data Extraction tool (Draft 210720)

This tool is a draft of the data extraction tool to be used in the EEF Feedback review. It is comprised of the EEF Database extraction tools (main, subject specific and outcome) put together in a single document.

EEF main data extraction v 1.0 October 2019 [Standard]

- Section 1 What is the publication type? [Not selectable (no checkbox)]

  - Journal article [Selectable (show checkbox)]
    A report published in a peer-reviewed journal with an ISSN.
  - Dissertation or thesis [Selectable (show checkbox)]
    A report of a study in a dissertation or thesis submitted as all or part of the assessment for a higher degree.
  - Technical report [Selectable (show checkbox)]
    An unpublished report, technical report or document providing details of a research study or studies without an ISSN or ISBN. (EEF evaluation reports are classified as technical reports.)
  - Book or book chapter [Selectable (show checkbox)]
    A report of a research study published in a book or book chapter with an ISBN
  - Conference paper [Selectable (show checkbox)]
    A report of a study presented at a research conference and subsequently made more widely available.
    NB Peer-reviewed conference proceedings with an ISBN should still be classified as a conference paper.
  - Other (Please specify) [Selectable (show checkbox)]
    A report not classifiable according to the categories above (e.g. a website). Please add further details in the notes field.

- Section 2 What is the research design and which methods were used? [Not selectable (no checkbox)]
  - What is the intervention name? [Selectable (show checkbox)]
    Provide the name of the intervention, programme or approach as given in the report.
  - How is the intervention described? [Selectable (show checkbox)]
    Brief summary of the intervention as provided in the report(s). Please include the rationale for impact on learning if given.
  - What are the intervention objectives? [Selectable (show checkbox)]
    Please provide the specific objectives or aims of the intervention, programme or approach as provided in the report
  - Is there more than one treatment group? [Not selectable (no checkbox)]
    Does the research design include more than one arm or contrast so that more than one estimate of the impact of the intervention or approach can be made from a different comparison group or version of the intervention?
    - Yes (Please specify) [Selectable (show checkbox)]
      Highlight in the text (or use the info box) to describe the design and specify the other interventions or comparisons relative to the main intervention group.
    - No [Selectable (show checkbox)]
    - Not specified or N/A [Selectable (show checkbox)]
  - How were participants assigned? [Not selectable (no checkbox)]
    How were the participants assigned or allocated to their group (i.e. treatment and control)?
    - Random (please specify) [Selectable (show checkbox)]
      Select this code where the report describes the participants' allocation to their group as random or pseudo-random (computer generated). Please highlight in the text or add information to the info box about the randomisation details.
    - Non-random, but matched [Selectable (show checkbox)]
      No randomisation, but matched at allocation prospectively to balance on attainment (or on attainment and other variables).
    - Non-random, not matched prior to treatment [Selectable (show checkbox)]
      No random allocation and not matched prior to treatment. The nature and extent of any group differences in attainment at baseline is described and then accounted for in the analysis of impact (retrospective matching).
    - Unclear [Selectable (show checkbox)]
      Please only select this code if there are no details about control and intervention allocation or if the information is so unclear as to prevent a reasonable inference.
    - Not assigned - naturally occurring sample [Not selectable (no checkbox)]
      This is where researchers take advantage of a situation where a comparison

can be made between groups from changes that either are planned or have already happened which will give and estimate of the impact of the intervention or approach of interest.

- Retrospective Quasi Experimental Design (QED) [Selectable (show checkbox)]
  Where an experiment is created from a naturally occuring situation and two groups (or more) are compared to give an estimate of impact.
- Regression discontinuity [Selectable (show checkbox)]
  This is a type is a quasi-experimental pretest-posttest design that identifies the causal effects of an intervention or approach by assigning a cutoff or threshold above or below which an intervention is assigned (e.g. policy change where smaller classses are introduced in a district or a test is used to allocate students to additional support). By comparing results close to but either side of the threshold, it is possible to estimate effect.

- What was the level of assignment? [Not selectable (no checkbox)]
  At which level was the assignment to intervention and control group conducted?
  - Individual [Selectable (show checkbox)]
    The assignment was at the level of the individual student or pupil. No account was taken of class or school. All of the individual participants were included as a single group for allocation or randomisation.
  - Class [Selectable (show checkbox)]
    The class or usual teaching group of the students was the level at which the intervention or approach was allocated. Intact classes were allocated or assigned to the intervention or approach (taking no account of school).
  - School - cluster [Selectable (show checkbox)]
    The school was the level of assignment and all pupils in a single school are allocated to the same grouping (i.e. a single school would not include both intervention and control).
  - School - multi-site [Selectable (show checkbox)]
    The school is the level of assignment, but each school contains both intervention and control groups. The design allows a within school comparison to be made.
  - Region or district [Selectable (show checkbox)]
    The region or district is the level at which the assignment is made.
  - Not provided/ not available [Selectable (show checkbox)]
    A description of the level of allocation is not provided or available in the report.
  - Not applicable [Selectable (show checkbox)]
- How realistic was the study? [Not selectable (no checkbox)]
  Was the intervention implemented under "real world" conditions? Factors to

consider in assessing the 'ecological validity' include where the intervention took place (usual educational setting for educational approaches of this kind) and who taught or led the intervention with the pupils (e.g. did it involve usual teachers or other education professionals).

- High ecological validity [Selectable (show checkbox)]
  Select this code where the intervention or approach seems realistic for schools or teachers to adopt.
  Any adaptations to enable the research to be conducted do not appear to affect the validity of the findings and implications for schools. Studies which take place in schools and are taught by the usual teachers or staff have high ecological validity.
- Low ecological validity [Selectable (show checkbox)]
  Select this code where the intervention or approach does not seems realistic or practical for schools or teachers to adopt. Studies which take place in laboratory settings and are only taught by researchers have low ecological validity.
- Unclear [Selectable (show checkbox)]
  Select this code where there are no details about where the intervention took place or who was responsible for its delivery and it is not possible to infer sufficient details to make a judgement about the ecological validity of the study.

- Section 3 Where did the study take place? [Not selectable (no checkbox)]
  - In which country/countries was the study carried out? (Select ALL that apply) [Not selectable (no checkbox)]
    Countries which are recognised as sovereign states by the United Nations. If you think there is a country missing please ask!
    - UK (Select all that apply) [Selectable (show checkbox)]
      - England [Selectable (show checkbox)]
      - Northern Ireland [Selectable (show checkbox)]
      - Scotland [Selectable (show checkbox)]
      - Wales [Selectable (show checkbox)]
    - USA [Selectable (show checkbox)]
    - Afghanistan [Selectable (show checkbox)]
    - Albania [Selectable (show checkbox)]
    - Argentina [Selectable (show checkbox)]
    - Angola [Selectable (show checkbox)]
    - Armenia [Selectable (show checkbox)]
    - Austria [Selectable (show checkbox)]
    - Australia [Selectable (show checkbox)]
    - Azerbaijan [Selectable (show checkbox)]

- Bahamas, The [Selectable (show checkbox)]
- Bahrain [Selectable (show checkbox)]
- Bangladesh [Selectable (show checkbox)]
- Belarus [Selectable (show checkbox)]
- Barbados [Selectable (show checkbox)]
- Belize [Selectable (show checkbox)]
- Belgium [Selectable (show checkbox)]
- Benin [Selectable (show checkbox)]
- Bhutan [Selectable (show checkbox)]
- Bosnia and Herzegovina [Selectable (show checkbox)]
- Botswana [Selectable (show checkbox)]
- Brazil [Selectable (show checkbox)]
- Bolivia [Selectable (show checkbox)]
- Brunei Darussalam [Selectable (show checkbox)]
- Burkina Faso [Selectable (show checkbox)]
- Bulgaria [Selectable (show checkbox)]
- Cabo Verde [Selectable (show checkbox)]
- Cambodia [Selectable (show checkbox)]
- Canada [Selectable (show checkbox)]
- Cameroon [Selectable (show checkbox)]
- Central African Republic [Selectable (show checkbox)]
- Chad [Selectable (show checkbox)]
- Chile [Selectable (show checkbox)]
- Colombia [Selectable (show checkbox)]
- Congo [Selectable (show checkbox)]
- Costa Rica [Selectable (show checkbox)]
- Côte d'Ivoire / Ivory Coast [Selectable (show checkbox)]
- Croatia [Selectable (show checkbox)]
- China [Selectable (show checkbox)]
  If just Hong Kong, use Hong King code only, NOT China
- Cuba [Selectable (show checkbox)]
- Cyprus [Selectable (show checkbox)]
- Denmark [Selectable (show checkbox)]
- Czech Republic [Selectable (show checkbox)]
- Dominican Republic [Selectable (show checkbox)]
- Egypt [Selectable (show checkbox)]
- Ecuador [Selectable (show checkbox)]
- El Salvador [Selectable (show checkbox)]
- Equatorial Guinea [Selectable (show checkbox)]

- Estonia [Selectable (show checkbox)]
- Eritrea [Selectable (show checkbox)]
- Ethiopia [Selectable (show checkbox)]
- Finland [Selectable (show checkbox)]
- Fiji [Selectable (show checkbox)]
- France [Selectable (show checkbox)]
- Gabon [Selectable (show checkbox)]
- Georgia [Selectable (show checkbox)]
- Gambia, The [Selectable (show checkbox)]
- Germany [Selectable (show checkbox)]
- Greece [Selectable (show checkbox)]
- Ghana [Selectable (show checkbox)]
- Guatemala [Selectable (show checkbox)]
- Grenada [Selectable (show checkbox)]
- Guinea-Bissau [Selectable (show checkbox)]
- Guinea [Selectable (show checkbox)]
- Guyana [Selectable (show checkbox)]
- Haiti [Selectable (show checkbox)]
- Honduras [Selectable (show checkbox)]
- Hong Kong (see China) [Selectable (show checkbox)]
- Hungary [Selectable (show checkbox)]
- Iceland [Selectable (show checkbox)]
- Indonesia [Selectable (show checkbox)]
- India [Selectable (show checkbox)]
- Iran [Selectable (show checkbox)]
- Iraq [Selectable (show checkbox)]
- Ireland [Selectable (show checkbox)]
- Italy [Selectable (show checkbox)]
- Israel [Selectable (show checkbox)]
- Jamaica [Selectable (show checkbox)]
- Japan [Selectable (show checkbox)]
- Jordan [Selectable (show checkbox)]
- Kenya [Selectable (show checkbox)]
- Kazakhstan [Selectable (show checkbox)]
- Kuwait [Selectable (show checkbox)]
- Kiribati [Selectable (show checkbox)]
- Lao (or Laos) [Selectable (show checkbox)]
  Lao People's Democratic Republic
- Kyrgyzstan [Selectable (show checkbox)]

- Latvia [Selectable (show checkbox)]
- Lebanon [Selectable (show checkbox)]
- Liberia [Selectable (show checkbox)]
- Lesotho [Selectable (show checkbox)]
- Libya [Selectable (show checkbox)]
- Liechtenstein [Selectable (show checkbox)]
- Luxembourg [Selectable (show checkbox)]
- Lithuania [Selectable (show checkbox)]
- Madagascar [Selectable (show checkbox)]
- Macedonia [Selectable (show checkbox)]
- Malaysia [Selectable (show checkbox)]
- Malawi [Selectable (show checkbox)]
- Mali [Selectable (show checkbox)]
- Maldives [Selectable (show checkbox)]
- Malta [Selectable (show checkbox)]
- Marshall Islands [Selectable (show checkbox)]
- Mauritania [Selectable (show checkbox)]
- Mauritius [Selectable (show checkbox)]
- Micronesia [Selectable (show checkbox)]
- Mexico [Selectable (show checkbox)]
- Moldova [Selectable (show checkbox)]
- Mongolia [Selectable (show checkbox)]
- Mozambique [Selectable (show checkbox)]
- Namibia [Selectable (show checkbox)]
- Myanmar (Burma) [Selectable (show checkbox)]
- Nepal [Selectable (show checkbox)]
- Nauru [Selectable (show checkbox)]
- The Netherlands [Selectable (show checkbox)]
- New Zealand [Selectable (show checkbox)]
- Nicaragua [Selectable (show checkbox)]
- Nigeria [Selectable (show checkbox)]
- Niger [Selectable (show checkbox)]
- Pakistan [Selectable (show checkbox)]
- Norway [Selectable (show checkbox)]
- Palau [Selectable (show checkbox)]
- Panama [Selectable (show checkbox)]
- Papua New Guinea [Selectable (show checkbox)]
- Peru [Selectable (show checkbox)]
- Philippines [Selectable (show checkbox)]

- Poland [Selectable (show checkbox)]
- Puerto Rico (US dependency) [Selectable (show checkbox)]
- Portugal [Selectable (show checkbox)]
- Qatar [Selectable (show checkbox)]
- Romania [Selectable (show checkbox)]
- Rwanda [Selectable (show checkbox)]
- Russia [Selectable (show checkbox)]
- Saint Kitts and Nevis [Selectable (show checkbox)]
- Saint Lucia [Selectable (show checkbox)]
- Saint Vincent and the Grenadines [Selectable (show checkbox)]
- San Marino [Selectable (show checkbox)]
- Samoa [Selectable (show checkbox)]
- Saudi Arabia [Selectable (show checkbox)]
- São Tomé and Príncipe [Selectable (show checkbox)]
- Serbia [Selectable (show checkbox)]
- Senegal [Selectable (show checkbox)]
- Seychelles [Selectable (show checkbox)]
- Sierra Leone [Selectable (show checkbox)]
- Slovakia [Selectable (show checkbox)]
- Singapore [Selectable (show checkbox)]
- Slovenia [Selectable (show checkbox)]
- Solomon Islands [Selectable (show checkbox)]
- South Africa [Selectable (show checkbox)]
- Somalia [Selectable (show checkbox)]
- South Korea / Republic of Korea [Selectable (show checkbox)]
- South Sudan [Selectable (show checkbox)]
- Sri Lanka [Selectable (show checkbox)]
- Spain [Selectable (show checkbox)]
- Sudan [Selectable (show checkbox)]
- Suriname [Selectable (show checkbox)]
- Swaziland / Eswatini [Selectable (show checkbox)]
- Sweden [Selectable (show checkbox)]
- Switzerland [Selectable (show checkbox)]
- Taiwan [Selectable (show checkbox)]
- Syria [Selectable (show checkbox)]
- Tanzania [Selectable (show checkbox)]
- Tajikistan [Selectable (show checkbox)]
- Thailand [Selectable (show checkbox)]
- Timor-Leste [Selectable (show checkbox)]

- Togo [Selectable (show checkbox)]
- Tonga [Selectable (show checkbox)]
- Tunisia [Selectable (show checkbox)]
- Trinidad and Tobago [Selectable (show checkbox)]
- Turkey [Selectable (show checkbox)]
- Turkmenistan [Selectable (show checkbox)]
- Tuvalu [Selectable (show checkbox)]
- Ukraine [Selectable (show checkbox)]
- Uganda [Selectable (show checkbox)]
- United Arab Emirates [Selectable (show checkbox)]
- Uruguay [Selectable (show checkbox)]
- Uzbekistan [Selectable (show checkbox)]
- Vanuatu [Selectable (show checkbox)]
- Venezuela [Selectable (show checkbox)]
- Vietnam [Selectable (show checkbox)]
- West Indies (Use for Caribbean colonial dependencies) [Selectable (show checkbox)]
  Cayman Islands (United Kingdom)
  Anguilla (United Kingdom)
  Antigua and Barbuda
  Aruba (Netherlands)
  Bonaire (Netherlands)
  British Virgin Islands (United Kingdom)
  Curaçao (Netherlands)
  Guadeloupe (France)
  Martinique (France)
  Montserrat (United Kingdom)
  Nueva Esparta (Venezuela)
  Saba (Netherlands)
  Saint Barthélemy (France)
  Saint-Martin (France)
  Sint Eustatius (Netherlands)
  Sint Maarten (Netherlands)
  United States Virgin Islands (United States)
  Federal Dependencies of Venezuela (Venezuela)
  Turks and Caicos Islands (United Kingdom)
- Yemen [Selectable (show checkbox)]
- Zambia [Selectable (show checkbox)]
- Zimbabwe [Selectable (show checkbox)]

- Is there more specific information about the location? [Not selectable (no checkbox)]
  Further information on where the study took part (e.g. city, district, urban, suburban, rural etc.) as provided by the study.
  - Specific to the location or place [Selectable (show checkbox)]
    Information about the specific place where the research was undertaken (e.g. name of the city, state, city or region)
  - Information about the type of location [Selectable (show checkbox)]
    Information about what kind of location (e.g. urban, rural, suburban).
  - No information provided [Selectable (show checkbox)]
    Please use this code if there is no further information about the specific location (place name) or the type of location (e.g. urban/ rural).
- What is the educational setting (Select ALL that apply) [Not selectable (no checkbox)]
  What is the type of educational setting that the students attend which is the focus of the intervention or approach?
  - Nursery school/pre-school [Selectable (show checkbox)]
    A separate nursery school or pre-school setting or a nursery or early years class in a primary school.
    The focus is on the type of setting or educational provision.
  - Primary/elementary school [Selectable (show checkbox)]
    A school for children of normal school age (depending on the jurisdiction). The focus is on the type of school or setting. Pupils will typically be between the ages of 5 and 11.
  - Middle school [Selectable (show checkbox)]
    An intermediate school provided in some jurisdictions for pupils between their primary (or elementary) and secondary educational stages.
  - Secondary/High school [Selectable (show checkbox)]
    A school for older pupils, after primary or elementary education (and after middle school where provided). Pupils will usually be between the ages of 11 and 18.
  - Residential/boarding school [Selectable (show checkbox)]
    A school where pupils reside as well as study; boarding either by week or over a term.
  - Independent/private school [Selectable (show checkbox)]
  - Home [Selectable (show checkbox)]
  - Further education/junior or community college [Selectable (show checkbox)]
    A formal educational setting for older secondary pupils. Students will usually be 16 or older, but still studying for school-level, vocational or professional qualifications (i.e. not higher education or leading to a Bachelor's degree)

    - Other educational setting (please specify) [Selectable (show checkbox)]
      An educational setting which cannot be classified under one of the other definitions. Please provide details of the educational setting as given in the study (e.g. field centre, museum classroom, concert or rehearsal hall, public theatre, workplace training, etc.)
    - Outdoor adventure setting [Selectable (show checkbox)]
      Educational activities taking place outdoors such as Outward Bound courses, sailing and kayaking or canoeing, camping, climbing or courses based at an outdoor education centre.
      All studies classified under the Toolkit strand 'Outdoor adventure learning' should be included.
      Field studies centres where the activities focus solely on school subjects like Geography or Biology should not be included (please use 'Other' for these and specify the type of setting).
    - No information provided [Selectable (show checkbox)]
- Section 4 What is the sample of the study? [Not selectable (no checkbox)]
  - What is the overall sample analysed? [Selectable (show checkbox)]
    What is the total number of participants in the data analysed (both intervention and control/comparison)? Please add additional details in the notes.
  - What is the gender of the students? [Not selectable (no checkbox)]
    Please indicate the gender of the total sample.
    - Female only [Selectable (show checkbox)]
    - Male only [Selectable (show checkbox)]
    - Mixed gender [Selectable (show checkbox)]
      Provide the percentage or number of female pupils in the study. Please highlight the section or add details of where this can be found in the report.
    - No information provided [Selectable (show checkbox)]
  - What is the age of the students? (Select ALL that apply) [Not selectable (no checkbox)]
    Please provide additional information if available (e.g. grade level(s), mean age, or mean and standard deviation).
    - 3 [Selectable (show checkbox)]
    - 4 [Selectable (show checkbox)]
    - 5 [Selectable (show checkbox)]
    - 6 [Selectable (show checkbox)]
    - 7 [Selectable (show checkbox)]
    - 8 [Selectable (show checkbox)]
    - 9 [Selectable (show checkbox)]
    - 10 [Selectable (show checkbox)]
    - 11 [Selectable (show checkbox)]

    - 12 [Selectable (show checkbox)]
    - 13 [Selectable (show checkbox)]
    - 14 [Selectable (show checkbox)]
    - 15 [Selectable (show checkbox)]
    - 16 [Selectable (show checkbox)]
    - 17 [Selectable (show checkbox)]
    - 18 [Selectable (show checkbox)]
    - No information provided [Selectable (show checkbox)]
  - What is the proportion of low SES/FSM students in the sample? [Not selectable (no checkbox)]
    What proportion of the students in the study are receiving free school meals (FSM) or reduced price lunches or are identified as being from a low socio-economic status? If possible, record this as a percentage. Please highlight or add further details as reported in the study.
    - FSM or low SES student percentage [Selectable (show checkbox)]
      Please add the percentage of pupils in the sample who are are receiving free school meals (FSM) or reduced price lunches or are identified as being from a low socio-economic status background.
    - Further information about FSM or SES in the study sample. [Selectable (show checkbox)]
      Please highlight any details provided in the study about the socio-economic status of the students involved in the research (such as eligibility for free or reduced price school meals or lunches).
    - No SES/FSM information provided [Selectable (show checkbox)]
      Select this option if there is no information about the socio-economic status of the students involved in the research (such as eligibility for free or reduced price school meals or lunches).
- Section 5 What was involved in the intervention? [Not selectable (no checkbox)]
  Details about the intervention, approach or policy being evaluated.
  - What type of organisation was responsible for providing the intervention? [Not selectable (no checkbox)]
    Please indicate what kind of organisation was responsible for the provision or management and organisation of the intervention?
    - School or group of schools [Selectable (show checkbox)]
    - Charity or voluntary organisation [Selectable (show checkbox)]
    - University/ researcher design [Selectable (show checkbox)]
    - Local education authority or district [Selectable (show checkbox)]
      Local education authority or district (government or public funding)
    - Private or commercial company [Selectable (show checkbox)]
    - Other (please provide details) [Selectable (show checkbox)]

- Was training for the intervention provided? [Not selectable (no checkbox)]
  Was training provided to the delivery team as part of the preparation and support for the intervention? If so, who provided it?
  - Yes (Please specify) [Selectable (show checkbox)]
    Please highlight the text or add details to the info box as provided in the report.
  - No [Selectable (show checkbox)]
  - Unclear/ Not specified [Selectable (show checkbox)]
- Who is the focus of the intervention? (Select ALL that apply) [Not selectable (no checkbox)]
  Who is the main focus of the intervention study? Although the interest of the Toolkit is on student outcomes, the focus of behavioural change may be on others in educational settings, such as teachers or parents. NB All interventions must report outcomes on student's attainment.
  - Students [Selectable (show checkbox)]
    The main focus of the intervention is on the behaviours, interactions or activities of the students or pupils. Others may be involved (such as in training to deliver or implement a new approach), but the main aim is to change students' activities, behaviours and interactions to improve educational outcomes.
  - Teachers [Selectable (show checkbox)]
    The main focus of the intervention is on the teachers and their behaviours, interactions and activities. Although the final outcome may be to improve students' attainment, the focus and study aims focus on the teachers as a clear or explicit part of the rationale.
  - Teaching assistants [Selectable (show checkbox)]
    The focus of the intervention includes teaching assistants or teacher's aides (and/or other para-professionals) and their behaviours, interactions and activities. Although the final outcome may be to improve students' attainment, the focus and study aims involve teaching assistants as part of the process.
  - Other education practitioners [Selectable (show checkbox)]
  - Non-teaching staff [Selectable (show checkbox)]
    The main focus of the intervention is on the non-teaching staff in schools and their behaviours, interactions and activities. This includes all staff who would not normally have a teaching role (e.g. administrative staff, lunchtime supervisors, facilities management etc.). Although the final outcome may be to improve students' attainment, the focus and study aims include the non-teaching staff as part of the rationale.
  - Senior management [Selectable (show checkbox)]
    The main focus of the intervention is on the senior management in schools

(e.g. headteachers, deputy head teachers, heads of department) and their behaviours, interactions and activities. Although the final outcome may be to improve students' attainment, the focus and study aims include the senior management as part of the rationale.

- Parents [Selectable (show checkbox)]
  Parents or carers of students in the educational settings involved are involved because of their parental or caring responsibilities.
- Other (Please specify) [Selectable (show checkbox)]

- What is the intervention teaching approach? (Select ALL that apply) [Not selectable (no checkbox)]
  What was the main teaching or learning approach used for an intervention session?
  - Large group/class teaching (+6) [Selectable (show checkbox)]
    A large group (more than 6 students) with a teacher or supporter of the intervention, typically in a classroom setting.
  - Small group/intensive support (3-5) [Selectable (show checkbox)]
    Intensive small group provision by a teacher, teaching assistant or other supporter of the intervention in small group setting (3 - 5 participants in a group), sometimes in a separate teaching space or classroom.
  - Paired learning [Selectable (show checkbox)]
    Two pupils either working together, or peer teaching each other
  - One to one [Selectable (show checkbox)]
    One to one instruction where the teacher is not a peer, but a teacher, teaching assistant, volunteer or other education professional.
  - Student alone (self-administered) [Selectable (show checkbox)]
    Pupils or students working through study materials independently and/or unsupervised.
  - Other (Explain in notes) [Selectable (show checkbox)]
- Were any of the following involved in the intervention or approach? [Not selectable (no checkbox)]
  - Digital technology [Not selectable (no checkbox)]
    The main approach depends on the use of digital technology (e.g. tablets, laptops, software, internet) by pupils or teachers (e.g. interactive whiteboards).
    - Yes [Selectable (show checkbox)]
    - No [Selectable (show checkbox)]
  - Parents or community volunteers [Not selectable (no checkbox)]
    Parents or community volunteers working with their children (or other pupils).

    - Yes [Selectable (show checkbox)]
    - No [Selectable (show checkbox)]
- When did the intervention take place? (Select ALL that apply) [Not selectable (no checkbox)]
  When was the intervention delivered?
    - During regular school hours [Selectable (show checkbox)]
      The intervention or approach takes place completely or mainly during regular school hours.
    - Before/after school [Selectable (show checkbox)]
      The intervention or approach takes place completely or mainly before or immediately after normal school hours. This should mainly apply to activities taking place on school or normal educational settings.
    - Evenings and/or weekends [Selectable (show checkbox)]
      Where the intervention or approach takes place during evenings or weekends. Activities which take place immediately after school and at school (or in the same educational setting) should not be included.
    - Summer/ holiday period [Selectable (show checkbox)]
      Where the educational activity takes place as additional time in what would normally be a holiday period (e.g. summer holidays or other vacation times).
    - Other (please specify) [Selectable (show checkbox)]
    - Unclear/ not specified [Selectable (show checkbox)]
      Use this code where there are no details provided of when the intervention was delivered and where the information provided does not allow a reasonable inference to be made about timing.
      The usual inference for most interventions where the timing is not specified will be 'During regular school hours'. If this inference cannot reasonably be made please indicate in the notes the details in the report which produce the ambiguity or lack of clarity.
- Who was responsible for the teaching at the point of delivery? (Select ALL that apply) [Not selectable (no checkbox)]
  Please provide details (e.g. staff involved, training level provided, number/ proportions of staff).
  This should focus on the experience of pupils, rather than any initial training and support.
    - Research staff [Selectable (show checkbox)]
      Select this code where the intervention or approach was delivered largely or exclusively by researchers or the research team.
    - Class teachers [Selectable (show checkbox)]
      Select this code when the intervention or approach was taught or delivered by

professional teachers as part of their usual teaching or wider professional activity.

- Teaching assistants [Selectable (show checkbox)]
  Select this code where the majority of the teaching or delivery of the intervention is undertaken by teaching assistants (or teacher's aides, para-professionals, auxiliary teachers, nursery nurses in early years settings and other cognate terms). These will be staff usually employed by a school, but without a full teaching qualification.
- Other school staff [Selectable (show checkbox)]
  Staff employed by the school, but neither teachers nor teaching assistants (or those in similar paid roles). It includes administrative staff, lunch-time supervisors, facilities staff.
- External teachers [Selectable (show checkbox)]
  Teachers or other professional educational staff hired or employed by the research team or the delivery organisation.
- Parents/carers [Selectable (show checkbox)]
  Parents or carers whose main relationship with the intervention is through their parental or caring responsibilities. This includes where parents working with their own children, or working with other children in the school or educational setting that their own children attend.
- Lay persons/volunteers [Selectable (show checkbox)]
  Adults (over 18 years) involved as volunteers or undertaking unpaid work who provide the majority of the support to pupils or lead in the delivery of the intervention to students.
- Peers [Selectable (show checkbox)]
  Other students or pupils at the same school or educational setting as the intervention group; or at another local school (e.g. secondary students tutoring pupils at their own or their peers' primary schools). Peers will normally be of similar age and socio-economic or cultural background. University students tutoring primary school pupils would not be classified as 'peers'.
- Digital technology [Selectable (show checkbox)]
  Include digital technology where the technology has a role in the educational activity, such as where automated feedback or marking is provided, or where it provides an explicit teaching role (intelligent tutoring or the use of explanatory videos) or where differentiated activities are offered or allocated automatically to learners. Incidental use of technology which is usually involved in the normal teaching and learning activities of the intervention group should not be included as this has already been recorded.
- Unclear/not specified [Selectable (show checkbox)]
  Use this code where there are no details provided of who or how the

intervention was delivered or where the information provided does not allow a reasonable inference to be made.

- What was the duration of the intervention? (Please add to info box and specify units) [Selectable (show checkbox)]
  Duration of the intervention or approach (from beginning to end). Please specify units (e.g. months, weeks, days). This may differ from the duration of the research project or evaluation which could involved pre- and post-testing periods.
- What was the frequency of the intervention? [Selectable (show checkbox)]
  What is the frequency of the intervention (as delivered)? e.g. daily, twice weekly, weekly monthly.
- What is the length of intervention sessions? [Selectable (show checkbox)]
  What is the length in minutes of a typical session?
- Are implementation details and/or fidelity details provided? [Not selectable (no checkbox)]
  Are details provided about how successfully the intervention was implemented or taken up? Please indicate what type of information by selecting the appropriate checkbox and higlighting relevant text in the report.
  - Qualitative [Selectable (show checkbox)]
    Please select if qualitative details about the intervention or approach are provided, such as describing and issues or challenges about implementation, or comments on the training and/ or implementation process.
  - Quantitative [Selectable (show checkbox)]
    Please select if quantitative details about implementation are provided, such as number of schools or teachers trained, or number of sessions attended.
  - No implementation details provided. [Selectable (show checkbox)]
    No details about the implementation process are provided.
- Are the costs reported? [Not selectable (no checkbox)]
  Are there any financial costs or details reported?
  - Yes (Please add details) [Selectable (show checkbox)]
    If this option is selected, please add details as provide in the report(s).
  - No [Selectable (show checkbox)]
- Who undertook the outcome evaluation? [Not selectable (no checkbox)]
  Here we are interested in how independent the evalution was.
  - The developer [Selectable (show checkbox)]
    This is the usual option and should be selected unless the information is unclear or confusing. This is where the researcher or developer evaluated their own programme or approach.
  - A different organization paid by developer [Selectable (show checkbox)]
    The development team is different from the evaluation team but it is

commissioned directly by the developer or researcher who developed the intervention approaches.

- An organization commissioned independently to evaluate [Selectable (show checkbox)]
  The research team is different from the evaluation team and commissioned independently (e.g. EEF reports).
- Unclear/not stated [Selectable (show checkbox)]
  There is insufficient information about the status of the evaluation research to indicate or infer how independent the evaluation is.
- Is this an EEF evaluation? [Selectable (show checkbox)]
  If the evaluation was funded by the Education Endowment Foundation please select.

- Section 6 What kind of primary outcomes are reported? [Not selectable (no checkbox)]
  - What kind of tests were used? (Select ALL that apply) [Not selectable (no checkbox)]
    What type(s) of test(s) were used to measure the intervention outcomes on learning at pupil/student level?
    - Standardised test (Please specify) [Selectable (show checkbox)]
      A standardised test is administered and scored in a consistent way. The properties of the test are established through piloting on a group to determine the mean and spread of the scores for a particular target group. Standardised tests are usually named and the properties published.
      Please add the name of the test(s) used, a brief description and any details reported.
    - Researcher developed test (Please add details) [Selectable (show checkbox)]
      A test developed or designed for a specific research project. Please add any details as provided in the report(s).
    - School-developed test (Please add details) [Selectable (show checkbox)]
      A test or examination developed and used by a school or schools involved in the research as part of their usual assessment approach. Please add any details as provided in the report(s).
    - National test or examination (Please specify) [Selectable (show checkbox)]
      A test or examination used in regional or national evaluations of student and school performance. These may be optional or compulsory, but are organised and/ or administered by the regional or national education administration in a particular jurisdiction.
    - International tests (Please specify) [Selectable (show checkbox)]
      Tests used for international comparisons of student performance (e.g. PISA, TIMMS, PIRLS etc.). Please specify the name of the test.

- Curriculum subjects tested (Select ALL that apply) [Not selectable (no checkbox)]
  If the outcomes relate to the subjects of the school curriculum outcomes, record which subjects are included.
  - Literacy (first language) [Not selectable (no checkbox)]
    Aspects of literacy including speaking and listening, reading and writing. Include study of literature when this is first language study.
    - Reading comprehension [Selectable (show checkbox)]
      This may include aspects such as main idea identification and passage comprehension. When a test provides different outcomes, e.g. TOWRE (Test of Word Reading Efficacy) provides word attack, word identification, & passage comprehension, choose passage comprehension as main outcome.
    - Decoding/phonics [Selectable (show checkbox)]
      These measures gave a focus on recognizing letters and making the correct sounds associated with the letters or letter combinations. They made be referred to as phonological or phonemic awareness.
    - Spelling [Selectable (show checkbox)]
      Where the focus is on the correct spelling of words.
    - Reading other [Selectable (show checkbox)]
      e.g. phonics, reading fluency, vocabulary comprehension (receptive vocabulary)
      When a test provides different outcomes, e.g. TOWRE (Test of Word Reading Efficacy) provides word attack, word identification, & passage comprehension, choose passage comprehension as main outcome
    - Speaking and listening/Oral language [Selectable (show checkbox)]
      Speaking and listening or oral language and communication outcomes, including vocabulary use (productive spoken vocabulary).
    - Writing [Selectable (show checkbox)]
      A test of written language including quality, quantity and written vocabulary (range).
  - Mathematics [Selectable (show checkbox)]
    All aspects of mathematics including number and numerical operations, shape and space (geometry), algebra, data-handling etc.
  - Science [Selectable (show checkbox)]
    All general science subjects including physics, chemistry, biology as well as specific subjects such as ecology or astronomy.
  - Social studies [Selectable (show checkbox)]
    Either integrated social studies courses or programmes or separate curriculum areas of social studies (e.g. history, geography, civics, sociology, economics or anthropology).

- Arts [Selectable (show checkbox)]
  Expressive and performing arts, including music, art, drama, drawing, painting, sculpture and the decorative arts.
- Languages [Selectable (show checkbox)]
  Where the aim is to develop communicative or literacy capability in a language other than the first language or usual language of instruction in the school.
- Other curriculum test [Selectable (show checkbox)]
  Please provide a description of the outcome as reported where it is a test of a school curriculum subject not included in the categories above (e.g. music, art, classics).

- In addition to the primary educational attainment outcome, are there other outcomes reported? [Not selectable (no checkbox)]
  - Yes [Selectable (show checkbox)]
  - No [Selectable (show checkbox)]
- If yes, which other outcomes are reported? [Not selectable (no checkbox)]
  - Cognitive outcomes measured (Please specify) [Selectable (show checkbox)]
    If non-curricular cognitive outcomes are measured, please indicate and specify the outcomes (e.g. reasoning, memory, intelligence, etc.). Include the name of the test where possible (e.g. Raven's Matrices, Stanford–Binet Intelligence Scales etc.).
  - Other types of student outcomes (Please specify) [Selectable (show checkbox)]
    e.g. attendance, measures of behaviour, health status, non-cognitive attitudes/dispositions, etc. as assessed through a test or a survey.
  - Other participants (i.e. not students) outcomes (Please specify) [Selectable (show checkbox)]
    If outcomes are measured and reported for other participants involved in the research (such as teachers or parents), please note which participants and which outcomes have been measured e.g. parental participation.

- **Feedback v.02 Oct 2018 [Not selectable (no checkbox)]**
  Feedback is information given to the learner and/or the teacher about the learner's performance relative to learning goals. It should aim towards (and be capable of producing) improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome. It can be about the learning activity itself, about the process of activity, about the student's management of their learning or self-regulation or (the least effective) about them as individuals. This feedback can be verbal, written, or can be given through tests or via digital technology. It can come from a teacher or someone taking a teaching role, or from

What was the source of the feedback? [Not selectable (no checkbox)]

- Teacher [Selectable (show checkbox)]
- Teaching assistant [Selectable (show checkbox)]
- Volunteer [Selectable (show checkbox)]
- Parent(s) or other relatives [Selectable (show checkbox)]
  Parent(s), carer(s) or guardian(s). Also use for other family members (such as grandparents or siblings).
- Researcher [Selectable (show checkbox)]
- Peer (same age/ class) [Selectable (show checkbox)]
- Peer (group) [Selectable (show checkbox)]
  Feedback from more than one same age pupil (e.g. when feedback is formalised in collaborative learning)
- Peer (older) [Selectable (show checkbox)]
- Digital or automated [Selectable (show checkbox)]
  Feedback from a computer or other digital device (e.g. mobile phone, website or program) where there is some automation involved.
- Other non-human [Selectable (show checkbox)]
  Such as from a worked example or where answers are checked after the task has been completed.
- Self [Selectable (show checkbox)]
  Only use this code when checking or self-assessment is strategic and self-regulated (such as applying a checking algorithm or mnemonic).
- Other (please specify) [Selectable (show checkbox)]
  Please add notes about the source for this category, as described in the study.

- Who was the feedback directed to? [Not selectable (no checkbox)]
  This will almost always be to pupils, but may be to the teacher. If to the teacher, then there should be some explicit model of further feedback to change subsequent pupil behaviours or performance.
  - Individual pupil [Selectable (show checkbox)]
  - General (group or class) [Selectable (show checkbox)]
    Where the feedback is not specific to an individual learner, please indicate.
  - Teacher [Selectable (show checkbox)]
    Only select this code when this is explicitly part of the model of feedback in the research study.

- What form did the feedback take? (Select one) [Selectable (show checkbox)]
  This focuses on how the feedback was communicated. Choose the main feedback approach if there is more than one.
  - Spoken verbal [Selectable (show checkbox)]
    Feedback provided in spoken form, this includes audio recorded comments.
  - Non-verbal [Selectable (show checkbox)]
    Where feedback was communicated physically other that with words, such a through body language, gesture or other non-verbal means, such as extended wait time.
  - Written verbal [Selectable (show checkbox)]
    Where written comments are provided, either handwritten or digitally.
  - Written, non-verbal [Selectable (show checkbox)]
    Such as tick or check marks, or with symbols or icons (this includes marked tests or test results).

- When did the feedback happen? (Select one) [Not selectable (no checkbox)]
  Choose the option which best describes the feedback timing.
  - Prior to the task [Selectable (show checkbox)]
    Sometimes described as 'feedforward', this is where pupils are primed with information before undertaking a task (e.g. students complete test and get positive, negative results regardless of actual score and then their performance on a following test is measured).
  - During the task [Selectable (show checkbox)]
    Where the feedback is contemporaneous with the task or part of the task.

- Immediate [Selectable (show checkbox)]
  Where the feedback was provided immediately or shortly after the activity was completed (such as at the end of the task, or later the same day.
- Delayed (short) [Selectable (show checkbox)]
  Where the feedback occurred more than one day and up to a week after the task or activity.
- Delayed (long) [Selectable (show checkbox)]
  Where the feedback occurred more that a week after the task of activity.

- What kind of feedback was provided? [Not selectable (no checkbox)]
  - About the outcome [Selectable (show checkbox)]
    Where the feedback was about the outcome or completed task (e.g. correct or incorrect).
    - Correct [Selectable (show checkbox)]
      Where feedback was about the correct answers or responses
    - Incorrect [Selectable (show checkbox)]
      Where feedback focussed on the incorrect answers or responses.

  - About the process of the task [Selectable (show checkbox)]
    Where the feedback is about how the task or activity is currently being, or should be, undertaken (process rather than outcome).
  - About the learner's strategies or approach [Selectable (show checkbox)]
    Where the feedback was to support the learner's own regulation or control of what they were doing (i.e. metacognition and/or self-regulation) often in the form or prompts or cues.
  - About the person [Selectable (show checkbox)]
    Feedback directed at the individual or self, such as good boy or clever girl.

- What was the emotional tone of the feedback? [Not selectable (no checkbox)]
  Select the most appropriate description for the emotional tone of the feedback. Select more than one only where this is explicitly part of the design, otherwise select the best overall description, based on how it is described in the study.
  - Positive [Selectable (show checkbox)]
  - Neutral [Selectable (show checkbox)]
    Where the feedback was designed or perceived to be neutral in tone.

- Negative [Not selectable (no checkbox)]
  This is where the feedback is deliberately designed to be discouraging. It should not be used for feedback about incorrect responses or results.

Appendix 2 EEF Toolkit effect size data extraction v 1.0 October 2019 [Standard]

Data extraction tool to support meta-analysis of the impact data from included studies. Updated October, 2019.

This coding tool will be used in the EEF review with addition of codes on implementation and teacher workload

- Section 1 What are the details of the study design? [Not selectable (no checkbox)]
  - What was the study design? [Not selectable (no checkbox)]
    What type of study design is used for the evaluation of impact?
    - Individual RCT [Selectable (show checkbox)]
      An experimental design where individual participants are the unit of randomisation and no provision is made for clustering in the design or analysis.
    - Cluster RCT [Selectable (show checkbox)]
      An experimental design where school or class is the unit of randomisation (i.e. all pupils in the same school are in same group and where classes are randomised between schools. The school-level variance should be assigned to either intervention or control in the analysis.
    - Multisite RCT [Selectable (show checkbox)]
      An experimental design where both control and intervention pupils may be in the same class or school (within school/class) so that in the analysis the school or class level variance should be shared between intervention and control groups.
    - Prospective QED [Selectable (show checkbox)]
      A quasi-experimental design which is planned in advance. There may be a prospective allocation, but the design may also take advantage of a naturally occuring experiment. There is often some matching but no randomisation.
    - Retrospective QED [Selectable (show checkbox)]
      A post-hoc natural experiment where matching and/ or equivalence is achieved through the design and/or analysis. There is no attempt to mange control the intervention or phemomenon under investigation.
    - Interrupted time series QED [Selectable (show checkbox)]
      A design where the same group is treated as control and comparison e.g. ABAB and the counterfactual is created over time.
    - Regression Discontinuity with randomisation [Selectable (show checkbox)]
      Prospective regression discontinuity design where participants around the cut off are randomised to treatment or control.

- Regression Discontinuity - not randomised [Selectable (show checkbox)]
  RD with non-random allocation (prospective matching to create equivalence)
- Regression Continuity - naturally occurring [Selectable (show checkbox)]
  Regression Continuity design naturally occurring - retrospective matching.

  Exploits or manipulates a naturally occurring discontinuity to explore the causal effect of an educational intervention or approach. Regression discontinuity designs elicits the causal effects of interventions by assigning a cut off or threshold above or below which an intervention is assigned

- What is the number of schools involved in the study? [Not selectable (no checkbox)]
  - What is the number of schools involved in the intervention group(s)? [Selectable (show checkbox)]
    Please provide the number of schools involved in the intervention or versions of the intervention. Please only enter numeric data in the info box.
  - What is the number of schools involved in the control or comparison group? [Selectable (show checkbox)]
    Please provide the number of schools involved in the control group. Please only enter numeric data in the info box.
  - What is the total number of schools involved? [Selectable (show checkbox)]
    Please record the total number of schools involved in the study. This will be the sum of intervention and control schools in a cluster randomised trial, but in a multisite trial, where there are control and intervention pupils in each school, it may be the same as for intervention/ control. Please only enter numeric data in the info box.
  - Not provided/ unclear / not applicable [Selectable (show checkbox)]
    Please indicate if the number of schools involved in not provided, is unclear, or not applicable (such as in a Outdoor Education study).

- What is the number of classes involved? [Selectable (show checkbox)]
  - What is the total number of classes involved in the intervention group? [Selectable (show checkbox)]
    Please provide the number of classes involved in the intervention or versions of the intervention. Please only enter numeric data in the info box.
  - What is the total number of classes involved in the control or comparison group? [Selectable (show checkbox)]

Please provide the number of classes involved in the control group. Please only enter numeric data in the info box.

- What is the total number of classes involved? [Selectable (show checkbox)]
  Please record the total number of classes involved in the study. Please only enter numeric data in the info box.
- Not provided/ unclear / not applicable [Selectable (show checkbox)]
  Please indicate if the number of classes involved in not provided, is unclear, or not applicable (such as in a Outdoor Education study).

- Are details of randomisation provided? [Not selectable (no checkbox)]
  - Not applicable [Selectable (show checkbox)]
    Please select if the study is not described as a randomised design (e.g. Quasi-experimental or naturally occuring experiment).
  - No / Unclear [Selectable (show checkbox)]
    Please select if the study is described as randomised but no details are provided or these details are unclear. If the details are unclear, please highlight the relevant section of the report.

- Section 2 How is the sample described? [Not selectable (no checkbox)]
  Information about the sample size, groups and comparability.
  - What is the sample size for the intervention group? [Selectable (show checkbox)]
    Record the initial or assigned sample size for the treatment group in the notes. Please enter numeric data only in the info box. This should be either the main counterfactual comparison of the intervention or approach for the Toolkit from this study, or the first reported.
  - What is the sample size for the control group? [Selectable (show checkbox)]
    Record the initial or assigned sample size for the control group in the notes. Please enter numeric data only in the info box.
  - *What is the sample size for the second intervention group? [Selectable (show checkbox)]
    *Record the initial or assigned sample size for a second or alternative treatment group in the notes (*if there is one). This should be an equally valid comparison of the intervention or approach for the Toolkit as the first intervention group reported above. Please enter numeric data only in the info box.*

- *What is the sample size for the third intervention group? [Selectable (show checkbox)]
  *Record the initial or assigned sample size for a third or different treatment group in the notes (*if there is one). This should be an equally valid comparison of the intervention or approach for the Toolkit as the other intervention groups reported above. Please enter numeric data only in the info box.*
- Does the study report any group differences at baseline? [Not selectable (no checkbox)]
  Is there quantitative information about the similarity of treatment and control groups at the beginning of the intervention?
  - Yes [Selectable (show checkbox)]
    Please select if there is information provided about how comparable the intervention and control groups are at the beginning of the study in terms of the analysis. Please also highlight the relevant section of the text where this is possible.
  - No/Unclear [Selectable (show checkbox)]
    Please select this option if there is no information about the baseline comparability of the groups or if this is unclear. If there is information, but it is unclear, please highlight the relevant section of the study, where this is possible.
- Is comparability taken into account in the analysis? [Not selectable (no checkbox)]
  Are covariates in treatment and control groups assessed, and, if unbalanced, controlled in adjusted analysis?
  - Yes [Selectable (show checkbox)]
  - No [Selectable (show checkbox)]
  - Unclear or details not provided [Selectable (show checkbox)]
- Is attrition or drop out reported? [Not selectable (no checkbox)]
  If the sample recruited differs from the sample analysed, are the reasons for this reported? Please include details of attrition or drop-out or any pupils excluded from the analysis.
  - Yes [Selectable (show checkbox)]
  - No [Selectable (show checkbox)]
  - Unclear (please add notes) [Selectable (show checkbox)]
    Please check this option if the amount of atttrition is unclear. Please also add notes about attrition if there is information about different groups or outcomes.
- What is the attrition in the treatment group? [Selectable (show checkbox)]
  Number of drop-outs in the intervention group as a percentage of the n of the intervention group. Please enter numeric data only in the info box

- Are the variables used for comparability reported? [Not selectable (no checkbox)]
  Does the study state which variables are used to assess the comparability of the treatment and control groups?
  - Yes [Selectable (show checkbox)]
  - No [Selectable (show checkbox)]
  - N/A [Selectable (show checkbox)]
  - If yes, which variables are used for comparability? [Not selectable (no checkbox)]
    Select the variables considered in assessment of similarity e.g. prior attainment, age, gender, SES, special educational needs, ethnicity.
    - Educational attainment [Selectable (show checkbox)]
      A measure of either direct (e.g. reading comprehension) or indirect (reasoning) educational performance or capability.
    - Gender [Selectable (show checkbox)]
    - Socio-economic status [Selectable (show checkbox)]
    - Special educational needs [Selectable (show checkbox)]
    - Other (please specify) [Selectable (show checkbox)]
  - What is the total or overall percentage attrition? [Selectable (show checkbox)]
    Please report the percentage of drop-outs or overall attrition in the whole sample. This is the number of drop-outs divided by the initial sample x 100.Or you can calculate as the (initial sample minus the analysed sample) divided by the initial sample time 100. ((N-n)/N) x 100. Please add the % sign (e.g. 15.8%). For more information see: https://ies.ed.gov/ncee/wwc/Docs/OnlineTraining/wwc_training_m2.pdf
- Is clustering accounted for in the analysis? [Not selectable (no checkbox)]
  Does analysis take account of clustering? e.g. regression with school or cluster or MLM (multi-level modelling) or HLM (hierarchical linear modelling)?
  - Yes [Selectable (show checkbox)]
  - No [Selectable (show checkbox)]
  - Unclear [Selectable (show checkbox)]
- Yes [Selectable (show checkbox)]
  Please select if details are provided about how any randomisation was undertaken. Please highlight the relevant section of the study where possible.

- Section 3 Outcome details [Not selectable (no checkbox)]
  - Outcomes [Not selectable (no checkbox)]
    - Are descriptive statistics reported for the primary outcome? [Not selectable (no checkbox)]

- Yes [Selectable (show checkbox)]
  - If yes, please add for the intervention* group [Not selectable (no checkbox)]
    *Descriptive statistics for the intervention group. *If there is more than one intervention group please add this below.*
    - Number (n) [Selectable (show checkbox)]
      What is the number for the intervention group in the data analysed for this outcome? Add numeric data only to the info box.
    - Pre-test mean [Selectable (show checkbox)]
      Please record the pre-test mean (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
    - Pre-test standard deviation [Selectable (show checkbox)]
      Please record the pre-test standard deviation (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
    - Post-test mean [Selectable (show checkbox)]
      Please report the post-test mean for this outcome for the intervention group (if provided) for this outcome. Add numeric data only to the info box.
    - Post test standard deviation [Selectable (show checkbox)]
      Please record the post-test standard deviation for the intervention group for this outcome (if provided). Add numeric data only to the info box.
    - Gain score mean (if reported) [Selectable (show checkbox)]
      Please add the gain score (pre-test to post test) mean for the intervention group. Add numeric data only to the info box.
    - Gain score standard deviation (if reported) [Selectable (show checkbox)]
      Please add the gain score (pre-test to post test) standard deviation for the intervention group. Add numeric data only to the info box.
    - Any other information? [Selectable (show checkbox)]
      Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)), or use to add notes about the numeric data in the categories above.
  - If yes please add for the control group [Not selectable (no checkbox)]
    Descriptive statistics for the intervention group
    - Number (n) [Selectable (show checkbox)]
      What is the number for the control group in the data analysed for this outcome? Add numeric data only to the info box.

- Pre-test mean [Selectable (show checkbox)]
  Please record the pre-test mean (if provided) for the control group for this outcome. Add numeric data only to the info box.
- Pre-test standard deviation [Selectable (show checkbox)]
  Please record the pre-test standard deviation (if provided) for the control group for this outcome. Add numeric data only to the info box.
- Post-test mean [Selectable (show checkbox)]
  Please report the post-test mean for this outcome for the control group (if provided) for this outcome.
- Post test standard deviation [Selectable (show checkbox)]
  Please record the post-test standard deviation for the control group for this outcome (if provided).
- Gain score mean (if reported) [Selectable (show checkbox)]
  Add numeric data only to the info box.
- Gain score standard deviation (if reported) [Selectable (show checkbox)]
  Add numeric data only to the info box.
- Any other information? [Selectable (show checkbox)]
  Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)).

- If yes, please add for a second intervention* group (if needed) [Not selectable (no checkbox)]
  Descriptive statistics for a second intervention group, if needed.
  - Number (n) [Selectable (show checkbox)]
    What is the number for the intervention group in the data analysed for this outcome? Add numeric data only to the info box.
  - Pre-test mean [Selectable (show checkbox)]
    Please record the pre-test mean (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
  - Pre-test standard deviation [Selectable (show checkbox)]
    Please record the pre-test standard deviation (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
  - Post-test mean [Selectable (show checkbox)]
    Please report the post-test mean for this outcome for the intervention group (if provided) for this outcome. Add numeric data only to the info box.
  - Post test standard deviation [Selectable (show checkbox)]
    Please record the post-test standard deviation for the intervention

group for this outcome (if provided). Add numeric data only to the info box.

- Gain score mean (if reported) [Selectable (show checkbox)]
  Please add the gain score (pre-test to post test) mean for a second intervention group (if needed). Add numeric data only to the info box.
- Gain score standard deviation (if reported) [Selectable (show checkbox)]
  Please add the gain score (pre-test to post test) standard deviation for a second intervention group (if need). Add numeric data only to the info box.
- Any other information? [Selectable (show checkbox)]
  Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)), or use to add notes about the numeric data in the categories above.
- If needed, please add for the control group [Not selectable (no checkbox)]
  Descriptive statistics for the second control group (if needed and if different from the primary outcome control)
  - Number (n) [Selectable (show checkbox)]
    What is the number for the control group in the data analysed for this outcome? Add numeric data only to the info box.
  - Pre-test mean [Selectable (show checkbox)]
    Please record the pre-test mean (if provided) for the control group for this outcome. Add numeric data only to the info box.
  - Pre-test standard deviation [Selectable (show checkbox)]
    Please record the pre-test standard deviation (if provided) for the control group for this outcome. Add numeric data only to the info box.
  - Post-test mean [Selectable (show checkbox)]
    Please report the post-test mean for this outcome for the control group (if provided) for this outcome.
  - Post test standard deviation [Selectable (show checkbox)]
    Please record the post-test standard deviation for the control group for this outcome (if provided).
  - Gain score mean (if reported) [Selectable (show checkbox)]
    Please add the gain score (pre-test to post test) mean for this group (if need). Add numeric data only to the info box.
  - Gain score standard deviation (if reported) [Selectable (show checkbox)]
    Please add the gain score (pre-test to post test) standard

deviation for this group (if need). Add numeric data only to the info box.

- Any other information? [Selectable (show checkbox)]
  Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)).

- If yes, please add for a third intervention* group (if needed) [Not selectable (no checkbox)]
  Descriptive statistics for a third intervention group, if needed.
  - Number (n) [Selectable (show checkbox)]
    What is the number for the intervention group in the data analysed for this outcome? Add numeric data only to the info box.
  - Pre-test mean [Selectable (show checkbox)]
    Please record the pre-test mean (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
  - Pre-test standard deviation [Selectable (show checkbox)]
    Please record the pre-test standard deviation (if provided) for the intervention group for this outcome. Add numeric data only to the info box.
  - Post-test mean [Selectable (show checkbox)]
    Please report the post-test mean for this outcome for the intervention group (if provided) for this outcome. Add numeric data only to the info box.
  - Post test standard deviation [Selectable (show checkbox)]
    Please record the post-test standard deviation for the intervention group for this outcome (if provided). Add numeric data only to the info box.
  - Gain score mean (if reported) [Selectable (show checkbox)]
    Please report the gain score (pre-test to post-test) mean for this outcome for a third intervention group (if needed) for this outcome. Add numeric data only to the info box.
  - Gain score standard deviation (if reported) [Selectable (show checkbox)]
    Add numeric data only to the info box.
  - Any other information? [Selectable (show checkbox)]
    Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)), or use to add notes about the numeric data in the categories above.
  - If needed please add for a control group [Not selectable (no checkbox)]
    Descriptive statistics for a third control group (if needed and if different from the primary outcome control)

        - Number (n) [Selectable (show checkbox)]
          What is the number for the control group in the data analysed for this outcome? Add numeric data only to the info box.
        - Pre-test mean [Selectable (show checkbox)]
          Please record the pre-test mean (if provided) for the control group for this outcome. Add numeric data only to the info box.
        - Pre-test standard deviation [Selectable (show checkbox)]
          Please record the pre-test standard deviation (if provided) for the control group for this outcome. Add numeric data only to the info box.
        - Post-test mean [Selectable (show checkbox)]
          Please report the post-test mean for this outcome for the control group (if provided) for this outcome.
        - Post test standard deviation [Selectable (show checkbox)]
          Please record the post-test standard deviation for the control group for this outcome (if provided).
        - Gain score mean (if reported) [Selectable (show checkbox)]
          Add numeric data only to the info box.
        - Gain score standard deviation (if reported) [Selectable (show checkbox)]
          Add numeric data only to the info box.
        - Any other information? [Selectable (show checkbox)]
          Please add any other statistical information reported about this outcome for the intervention group (e.g. standard error (SE)).
    - No [Selectable (show checkbox)]
- Is there follow up data? [Not selectable (no checkbox)]
  Please provide details of any assessment to measure long lasting effects (e.g. delayed post-test or long term follow up)
    - Yes [Selectable (show checkbox)]
    - No [Selectable (show checkbox)]
- Primary outcome [Outcome]
  Please indicate the primary outcome and enter additional data using the 'Outcomes' box.
  The primary outcome should be the outcome most relevant to the Toolkit strand(s) in terms of educational impact, such as standardised tests of reading or mathematics (for literacy or mathematics interventions) or national test or examination results. See handbook and supporting resources for further information.
- Secondary outcome(s) [Outcome]
  Please add secondary outcomes in this section where they represent a fair test

of the impact of the evaluation at post test. This should not include delayed or follow up tests, or outcomes used to check the specificity of impact (e.g. a maths test use to control for intervention effect in a literacy intervention) or checking for transfer outcomes.

- SES/FSM outcome [Outcome]
  If a separate effect is reported for low socio-economic status or free or reduced price school meals pupils please add here.

- Outcome classification [Not selectable (no checkbox)]
  Outcome classifications for meta-analysis and meta-regressions. Please select all that apply
  - Sample (select one from this group) [Not selectable (no checkbox)]
    Outcome classification relating to the sample.
    - Sample: All [Outcome classification code]
      Analysis applied to normal or typical sample of pupils. The whole range of attainment or 'ability' for the educational setting was included in the intervention.
    - Sample: Exceptional [Outcome classification code]
      Students described as gifted and talented or of exceptional 'ability'. Usually those in the top 10 per cent of the distribution.
    - Sample: High achievers [Outcome classification code]
      Classification of the students in the sample in relation to their level of academic attainment. Those described as high attainers or high 'ability'; usually those in the top half or the top third of the distribution (depending on classifications).
    - Sample: Average [Outcome classification code]
      Classification of the students in the sample in relation to their level of academic attainment. Those described as performing at or around average attainment or of average 'ability'; usually those in the middle quartiles (depending on classifications).
    - Sample: Low achievers [Outcome classification code]
      Classification of the students in the sample in relation to their level of academic attainment. Those described as low attainers or low 'ability'; usually those in the bottom half or the bottom third of the distribution (depending on classifications).
  - Test type (select one from this group) [Not selectable (no checkbox)]
    - Test type: Standardised test [Outcome classification code]
      A standardised test is administered and scored in a consistent way. The properties of the test are established through piloting on a group to determine the mean and spread of the scores for a particular target group. Standardised tests are usually named and the properties published.

    - Test type: Researcher developed test [Outcome classification code]
      A test developed or designed for a specific research project
    - Test type: National test [Outcome classification code]
      A test or examination used in regional or national evaluations of students and school performance. These may be optional or compulsory, but are organised and/or administered by the regional or national administration in a particular jurisdiction.
    - Test type: School-developed test [Outcome classification code]
      A test or examination developed and used by a school or schools involved in the research as part of their usual assessment approach.
    - Test type: International tests [Outcome classification code]
      Tests used for international comparisons of student performance (e.g. PISA, TIMMS, PIRLS, etc.)
- Effect size calculation (select one from this group) [Not selectable (no checkbox)]
  What kind of effect size is being reported for this outcome?
    - Post-test unadjusted (select one from this group) [Outcome classification code]
      A simple comparison of the differences between control and intervention groups using only the post-test data, usually from an older randomised controlled trial (RCT) or where baseline equivalence has been established.
    - Post-test adjusted for baseline attainment [Outcome classification code]
      A post-test comparison where a measure of educational attainment at pre-test is controlled for in the analysis of the impact of the intervention or approach e.g. ANCOVA, OLS regression.
    - Post-test adjusted for baseline attainment AND clustering [Outcome classification code]
      A post-test comparison where a measure of educational attainment at pre-test is controlled for in the analysis of the impact of the intervention or approach and where the estimate is adjusted for clustering at class or school level (e.g. ANCOVA, MLM, OLS regression).
    - Pre-post gain [Outcome classification code]
      Outcome assessment based on the difference between an individual's pre-test and post test scores and the range of these difference (gain score or pre-post analysis).
- Toolkit strand(s) (select at least one Toolkit strand) [Not selectable (no checkbox)]
  Please select the Toolkit strand or strands which this outcome is evaluating. Each study has usually been classified as appropriate for the Tookit. There will not usually be more than one, but occasionally some outcomes are appropriate measures of more than one approach (such as when a teaching

assistant delivers a phonics intervention). If unsure please check with the Tookit team.

- Toolkit: Arts participation [Outcome classification code]
  Arts participation is defined as involvement in artistic and creative activities, such as dance, drama, music, painting, or sculpture. It can occur either as part of the curriculum or as extra-curricular activity. Participation may be organised as regular weekly or monthly activities, or more intensive programmes such as summer schools or residential courses. Whilst these activities have educational value in themselves, this Toolkit entry focuses on the benefits of arts participation for core academic attainment.
- Toolkit: Aspiration interventions [Outcome classification code]
  By aspirations we mean the things children and young people hope to achieve for themselves in the future. To meet their aspirations about careers, university, and further education, pupils often require good educational outcomes. Raising aspirations is therefore often believed to incentivise improved attainment.
- Toolkit: Behaviour interventions [Outcome classification code]
  Behaviour interventions seek to improve attainment by reducing challenging behaviour. This entry covers interventions aimed at reducing a variety of behaviours, from low-level disruption to general anti-social activities, aggression, violence, bullying, and substance abuse. The interventions themselves can be split into three broad categories:
  1. Approaches to developing a positive school ethos or improving discipline across the whole school which also aim to support greater engagement in learning.
  2. Universal programmes which seek to improve behaviour and generally take place in the classroom.
  3. More specialised programmes which are targeted at students with specific behavioural issues.
- Toolkit: Block scheduling [Outcome classification code]
  Block scheduling is an approach to school timetabling in secondary schools. It typically means that pupils have fewer classes (4-5) per day, for a longer period of time (70-90 minutes). The three main types of block schedules found in the research are:
  4x4 block scheduling: 4 blocks of extended (80–90 minute) classes each day, covering the same 4 subjects each day. Students take 4 subjects over 1 term, and 4 different subjects in the following term. A/B block scheduling: 3 or 4 blocks of extended (70–90 minute) classes each day, covering the same 3 or 4 subjects on alternating days. Students take 6 or 8 subjects each term. Hybrid: a hybrid of traditional models and 3/4-class-per-day

approaches. Students have 5 classes per day, of between 60 and 90 minutes.

- Toolkit: Built environment [Outcome classification code]
  Changing the physical conditions or built environment of the learning setting, either by moving to a new school building or seeking to improve the structure, air quality, noise, light, or temperature of an existing building or classroom.
- Toolkit: Collaborative learning [Outcome classification code]
  A collaborative (or cooperative) learning approach involve pupils working together on activities or learning tasks in a group small enough for everyone to participate on a collective task that has been clearly assigned. Pupils in the group may work on separate tasks contributing to a common overall outcome, or work together on a shared task.
  Some collaborative learning approaches put mixed ability teams or groups to work in competition with each other in order to drive more effective collaboration. There is a very wide range of approaches to collaborative and cooperative learning involving different kinds of organisation and tasks. Peer tutoring can also be considered as a type of collaborative learning, but in the Toolkit it is reviewed it as a separate topic.
- Toolkit: Digital technology [Outcome classification code]
  The use of digital technologies to support learning. Approaches in this area are very varied, but a simple split can be made between:
  Programmes for students, where learners use technology in problem solving or more open-ended learning, and
  Technology for teachers such as interactive whiteboards or learning platforms which may be used by the teachers, or where the technology may provide instruction more directly.
- Toolkit: Early years intervention [Outcome classification code]
  Early years or early childhood interventions are approaches that aim to ensure that young children have educationally based pre-school or nursery experiences which prepare for school and academic success, usually through additional nursery or pre-school provision. Many of the researched programmes and approaches focus on disadvantaged children. Some also offer parental support. The research summarised here looks at general or multi-component programmes and approaches.
- Toolkit: Extending school time [Outcome classification code]
  This summary focuses on extending core teaching and learning time in schools and the use of targeted before and after school programmes. Other approaches to increasing learning time are included in other sections of the Toolkit, such as Homework, Early years intervention and Summer schools.

The research focuses on three main approaches to extending teaching and learning time in schools:
extending the length of the school year;
extending the length of the school day; and
providing additional time for targeted groups of pupils, particularly disadvantaged or low-attaining pupils, either before or after school.

- Toolkit: Feedback [Outcome classification code]
  Feedback is information given to the learner and/or the teacher about the learner's performance relative to learning goals. It should aim towards (and be capable of producing) improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome. It can be about the learning activity itself, about the process of activity, about the student's management of their learning or self-regulation or (the least effective) about them as individuals. This feedback can be verbal, written, or can be given through tests or via digital technology. It can come from a teacher or someone taking a teaching role, or from peers.
- Toolkit: Homework [Outcome classification code]
  Homework refers to tasks given to pupils by their teachers to be completed outside of usual lessons. Common homework activities in primary schools tend to be reading or practising spelling and number facts, but may also include more extended activities to develop inquiry skills or more directed and focused work such as revision for tests which is more similar to homework set in secondary schools. Other homework activities may include reading or preparing for work to be done in class, or practising and completing tasks or activities already taught or started in lessons, as well as revision for exams.
- Toolkit: Individualised instruction [Outcome classification code]
  Individualised instruction involves different tasks for each learner and support at the individual level. It is based on the idea that all learners have different needs, and that therefore an approach that is personally tailored — particularly in terms of the activities that pupils undertake and the pace at which they progress through the curriculum — will be more effective. Various models of individualised instruction have been tried over the years in education, particularly in subjects like mathematics where pupils can have individual sets of activities which they complete, often largely independently. More recently, digital technologies have been employed to facilitate individual activities and feedback.
- Toolkit: Learning styles [Outcome classification code]
  The idea underpinning learning styles is that individuals all have a particular approach to or style of learning. The theory is that learning will

therefore be more effective or more efficient if pupils are taught using the specific style or approach that has been identified as their learning 'style'. For example, pupils categorised as having a 'listening' learning style, could be taught more through storytelling and discussion and less through traditional written exercises.

- Toolkit: Mastery learning [Outcome classification code]
  Mastery learning breaks subject matter and learning content into units with clearly specified objectives which are pursued until they are achieved. Learners work through each block of content in a series of sequential steps.
  Students must demonstrate a high level of success on tests, typically at about the 80% level, before progressing to new content. Mastery learning can be contrasted with other approaches which require pupils to move through the curriculum at a pre-determined pace. Teachers seek to avoid unnecessary repetition by regularly assessing knowledge and skills. Those who do not reach the required level are provided with additional tuition, peer support, small group discussions, or homework so that they can reach the expected level.
- Toolkit: Metacognition and self-regulation [Outcome classification code]
  Metacognition and self-regulation approaches aim to help pupils think about their own learning more explicitly, often by teaching them specific strategies for planning, monitoring and evaluating their learning. Interventions are usually designed to give pupils a repertoire of strategies to choose from and the skills to select the most suitable strategy for a given learning task.
  Self-regulated learning can be broken into three essential components:
  cognition - the mental process involved in knowing, understanding, and learning;
  metacognition - often defined as 'learning to learn'; and
  motivation - willingness to engage our metacognitive and cognitive skills.
- Toolkit: Mentoring [Outcome classification code]
  Mentoring in education involves pairing young people with an older peer or volunteer, who acts as a positive role model. In general, mentoring aims to build confidence, develop resilience and character, or raise aspirations, rather than to deliver specific academic skills or knowledge. Mentors typically build relationships with young people by meeting with them one to one for about an hour a week over a sustained period, either during school, at the end of the school day, or at weekends.
  Activities vary between different mentoring programmes, sometimes including direct academic support with homework or other school tasks. For programmes focused primarily on direct academic support see One to

one tuition and Peer tutoring.
Mentoring has increasingly been offered to young people who are deemed to be hard to reach or at risk of educational failure or exclusion.

- Toolkit: One to one tuition [Outcome classification code]
  One to one tuition involves a teacher, teaching assistant or other adult giving a pupil intensive individual support. It may happen outside of normal lessons as additional teaching – for example as part of Extending school time or a Summer school – or as a replacement for other lessons.
- Toolkit: Oral language interventions [Outcome classification code]
  Oral language interventions emphasise the importance of spoken language and verbal interaction in the classroom.
  They are based on the idea that comprehension and reading skills benefit from explicit discussion of either the content or processes of learning, or both. Oral language approaches include:
  Targeted reading aloud and discussing books with young children
  Explicitly extending pupils' spoken vocabulary
  The use of structured questioning to develop reading comprehension. All of the approaches reviewed in this section support learners' articulation of ideas and spoken expression, such as Thinking Together or Philosophy for Children. Oral language interventions therefore have some similarity to approaches based on metacognition, which make talk about learning explicit in classrooms, and to Collaborative Learning approaches, which promote pupils' talk and interaction in groups.
- Toolkit: Outdoor adventure learning [Outcome classification code]
  Outdoor adventure learning typically involves outdoor experiences, such as climbing or mountaineering; survival, ropes or assault courses; or outdoor sports, such as orienteering, sailing and canoeing. These can be organised as intensive residential courses or shorter courses run in schools or local outdoor centers.
  Adventure education usually involves collaborative learning experiences with a high level of physical (and often emotional) challenge. Practical problem-solving, explicit reflection and discussion of thinking and emotion (see also Metacognition and self-regulation) may also be involved.
  Adventure learning interventions typically do not include a formal academic component, so this summary does not include forest schools or field trips.
- Toolkit: Parental engagement [Outcome classification code]
  We define parental engagement as the involvement of parents in supporting their children's academic learning. It includes:
  1. approaches and programmes which aim to develop parental skills such as literacy or IT skills;

2. general approaches which encourage parents to support their children with, for example reading or homework;
3. the involvement of parents in their children's learning activities; and
4. more intensive programmes for families in crisis.

- Toolkit: Peer Tutoring [Outcome classification code]
  Peer tutoring includes a range of approaches in which learners work in pairs or small groups to provide each other with explicit teaching support. In cross-age tutoring, an older learner takes the tutoring role and is paired with a younger tutee or tutees. Peer-assisted learning is a structured approach for mathematics and reading with sessions of 25-35 minutes two or three times a week. In reciprocal peer tutoring, learners alternate between the role of tutor and tutee. The common characteristic is that learners take on responsibility for aspects of teaching and for evaluating their success. Peer assessment involves the peer tutor providing feedback to children relating to their performance and can have different forms such as reinforcing or correcting aspects of learning.
  Peers are defined as other students or pupils at the same school or educational setting as the intervention group; or at another local school (e.g. secondary students tutoring pupils at their own or their peers' primary schools). Peers will normally be of similar age and socio-economic or cultural background.
  University students tutoring primary school pupils would not usually be classified as 'peers'.
- Toolkit: Performance pay [Outcome classification code]
  Performance pay schemes aim to create a direct link between teacher pay or bonuses, and the performance of their class in order to incentivise better teaching and so improve outcomes. A distinction can be drawn between awards, where improved performance leads to a higher permanent salary, and payment by results, where teachers get a bonus for higher test scores. Approaches differ in how performance is measured and how closely those measures are linked to outcomes for learners. In some schemes, students' test outcomes are the sole factor used to determine performance pay awards. In others, performance judgements can also include information from lesson observations or feedback from pupils, or be left to the discretion of the headteacher.
- Toolkit: Phonics [Outcome classification code]
  Phonics is an approach to teaching reading, and some aspects of writing, by developing learners' phonemic awareness. This involves the skills of hearing, identifying and using phonemes or sound patterns in English. The aim is to systematically teach learners the relationship between these sounds and the written spelling patterns, or graphemes, which represent

them. Phonics emphasises the skills of decoding new words by sounding them out and combining or 'blending' the sound-spelling patterns.

- Toolkit: Reading comprehension strategies [Outcome classification code]
  Reading comprehension strategies focus on the learners' understanding of written text. Pupils are taught a range of techniques which enable them to comprehend the meaning of what they read. These can include: inferring meaning from context; summarising or identifying key points; using graphic or semantic organisers; developing questioning strategies; and monitoring their own comprehension and identifying difficulties themselves (see also 'Metacognition and self-regulation').
- Toolkit: Reducing class size [Outcome classification code]
  As the size of a class or teaching group gets smaller it is suggested that the range of approaches a teacher can employ and the amount of attention each student will receive will increase, thereby improving outcomes for pupils.
- Toolkit: Repeating a year [Outcome classification code]
  Pupils who do not reach a given standard of learning at the end of a year are required to repeat the year by joining a class of younger students the following academic year. This is also known as "grade retention", "non-promotion" or "failing a grade". For students at secondary school level, repeating a year is usually limited to the particular subject or classes that a student has not passed.
  Repeating a year is very rare in the UK but is relatively common in the USA where the No Child Left Behind Act (2002) recommended that students be required to demonstrate a set standard of achievement before progressing to the next grade level. Students can also be required to repeat a year in some European countries including Spain, France and Germany. In some countries, such as Finland, pupils can repeat a year in exceptional circumstances, but this decision is made collectively by teachers, parents and the student rather than on the basis of end of year testing.
- Toolkit: School uniform [Outcome classification code]
  Schools identify clothing considered appropriate for pupils to wear in school, and usually specify the style and colour. Schools vary as to how strictly a uniform policy is enforced.
- Toolkit: Setting or streaming [Outcome classification code]
  Pupils with similar levels of current attainment are grouped together either for specific lessons on a regular basis (setting or regrouping), or as a whole class (streaming or tracking). The assumption is that it will be possible to teach more effectively or more efficiently with a narrower range of attainment in a class.

- Toolkit: Small Group Tuition [Outcome classification code]
  Small group tuition is defined as one teacher or professional educator working with two, three, four, or five pupils. This arrangement enables the teacher to focus exclusively on a small number of learners, usually on their own in a separate classroom or working area. Intensive tuition in small groups is often provided to support lower attaining learners or those who are falling behind, but it can also be used as a more general strategy to ensure effective progress, or to teach challenging topics or skills.
- Toolkit: Social and emotional learning [Outcome classification code]
  Interventions which target social and emotional learning (SEL) seek to improve attainment by improving the social and emotional dimensions of learning, as opposed to focusing directly on the academic or cognitive elements of learning. SEL interventions might focus on the ways in which students work with (and alongside) their peers, teachers, family or community. Three broad categories of SEL interventions can be identified:
  1. Universal programmes which generally take place in the classroom;
  2. More specialised programmes which are targeted at students with particular social or emotional problems;
  3. School-level approaches to developing a positive school ethos which also aim to support greater engagement in learning.
- Toolkit: Sports participation [Outcome classification code]
  Sports participation interventions engage pupils in sports as a means to increasing educational engagement and attainment. This might be through after-school activities or a programme organised by a local sporting club or association. Sometimes sporting activity is used to encourage young people to engage in additional learning activities, such as football training at a local football club combined with study skills, ICT, literacy or mathematics lessons.
- Toolkit: Summer schools [Outcome classification code]
  Summer schools are lessons or classes during the summer holidays, and are often designed as catch-up programmes. Some summer schools do not have an academic focus and concentrate on sports or other non-academic activities. Others may have a specific focus, such as pupils at the transition from primary to secondary school, or advanced classes to prepare high-attaining pupils for university.
- Toolkit: Teaching assistants [Outcome classification code]
  Teaching assistants (also known as TAs or classroom support assistants) are adults who support teachers in the classroom. Teaching assistants' duties can vary widely from school to school, ranging from providing administrative and classroom support to providing targeted academic support to individual pupils or small groups.

Cognate terms: support staff; adult support staff; teaching assistants; associate staff; classroom assistants; classroom support assistant; auxiliary teachers; teacher's aide; education paraprofessional; nursery nurse (in early years' settings)

- DO NOT USE [Not selectable (no checkbox)]
  Please do not mark this section. This section is completed in the 'Outcome specific code' screen.
  - Comparison [Not selectable (no checkbox)]
    Please do not mark this section. This section is completed in the 'Outcomes specific code' screen.
    - With active control [Comparison]
      i.e. there is control for novelty/ an introduced new treatment
    - With business as usual [Comparison]
      i.e. comparison group having usual learning experience
    - With no equivalent teaching [Comparison]
      i.e. additional learning time / no treatment, such as in a Summer School intervention or a Before or After school club
  - Intervention outcome measure [Not selectable (no checkbox)]
    Type or focus of educational test used to measure the outcome of the impact of the intervention or approach.
    - Literacy: reading comprehension [Intervention]
      e.g. passage comprehension
    - Literacy: decoding/phonics [Intervention]
    - Literacy: spelling [Intervention]
    - Literacy: reading other [Intervention]
      Other reading outcomes (e.g. reading fluency, vocabulary comprehension (receptive vocabulary))
    - Literacy: speaking and listening/oral language [Intervention]
    - Literacy: writing [Intervention]
    - Mathematics [Intervention]
    - Science [Intervention]
    - Social Studies [Intervention]
      e.g. history, geography, economics
    - Arts [Intervention]
      e.g. music, art
    - Languages [Intervention]
      Second or foreign languages, based on the dominant language of instruction in the educational setting.

- Curriculum: other [Intervention]
  Other curriculum outcomes not included in the above options (please specify)
- Combined subjects [Intervention]
  Where the study combines two or more test outcomes from different subjects to provide an overall measure of educational progress (e.g. KS2 English and mathematics or multiple GCSE subjects.
- Cognitive: reasoning [Intervention]
  Tests of verbal, analogical or visual reasoning, including IQ or other 'intelligence' tests.
- Cognitive: other [Intervention]
  Other tests of cognitive performance such as working memory or perception.