Maximising the Impact of Teaching Assistants

Technical Notes

To accompany the Evaluation Report

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement, ensuring that children from all backgrounds can fulfil their potential and make the most of their talents.

The EEF aims to raise the attainment of children facing disadvantage by:

identifying promising educational innovations that address the needs of disadvantaged children in primary and secondary schools in England;

evaluating these innovations to extend and secure the evidence on what works and can be made to work at scale; and

encouraging schools, government, charities, and others to apply evidence and adopt innovations found to be effective.

The EEF was established in 2011 by the Sutton Trust as lead charity in partnership with Impetus Trust (now part of Impetus - Private Equity Foundation) and received a founding £125m grant from the Department for Education. Together, the EEF and Sutton Trust are the government-designated What Works Centre for improving education outcomes for school-aged children.

For more information about the EEF or this report please contact:
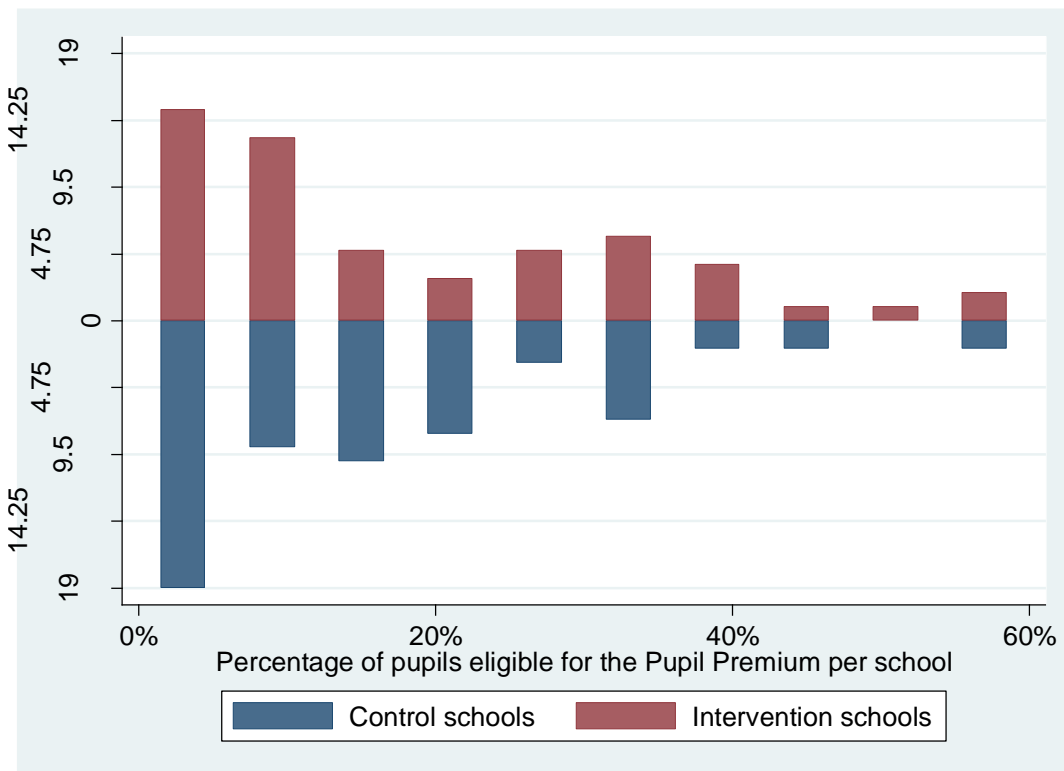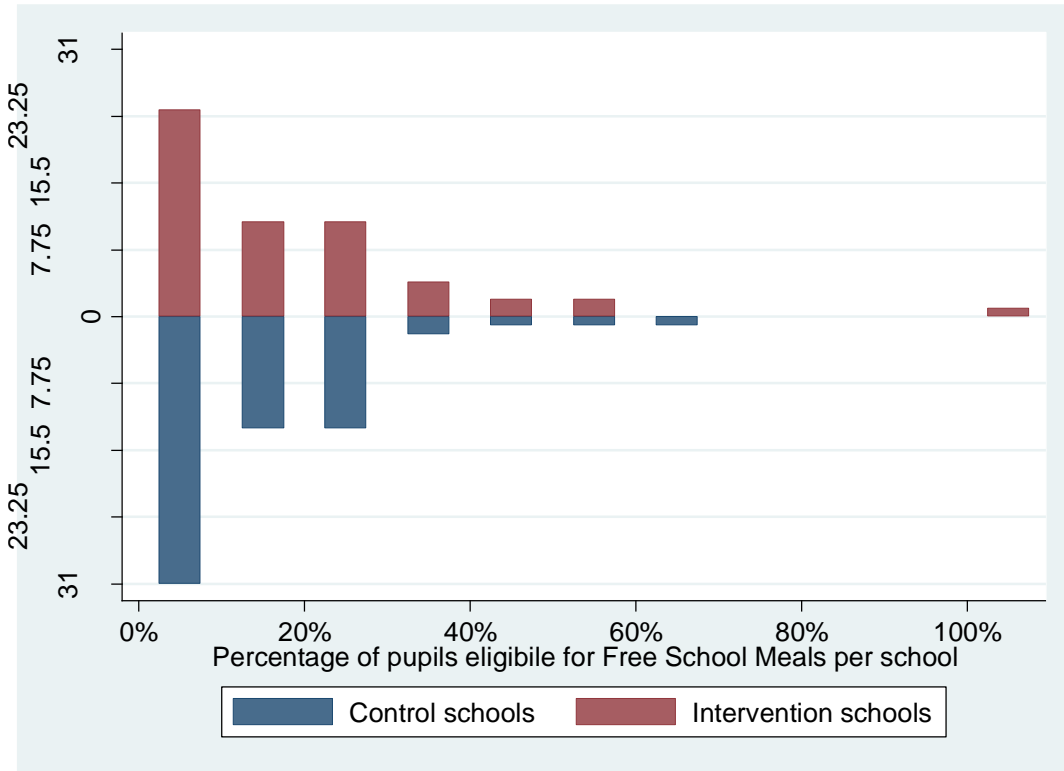
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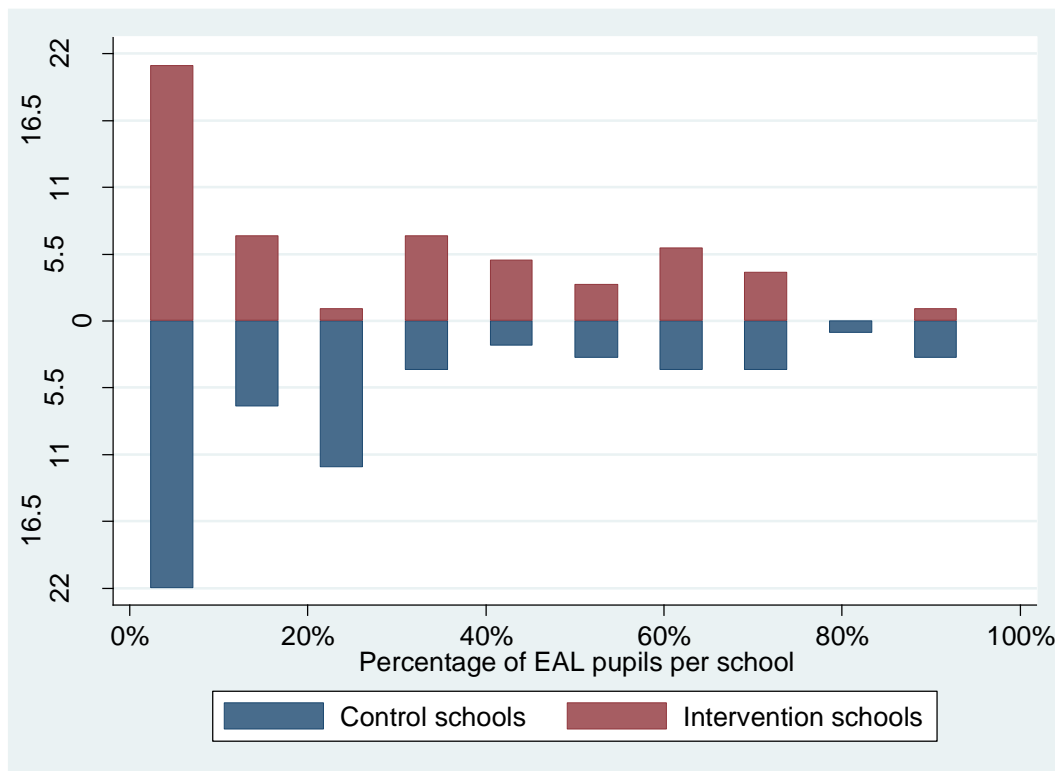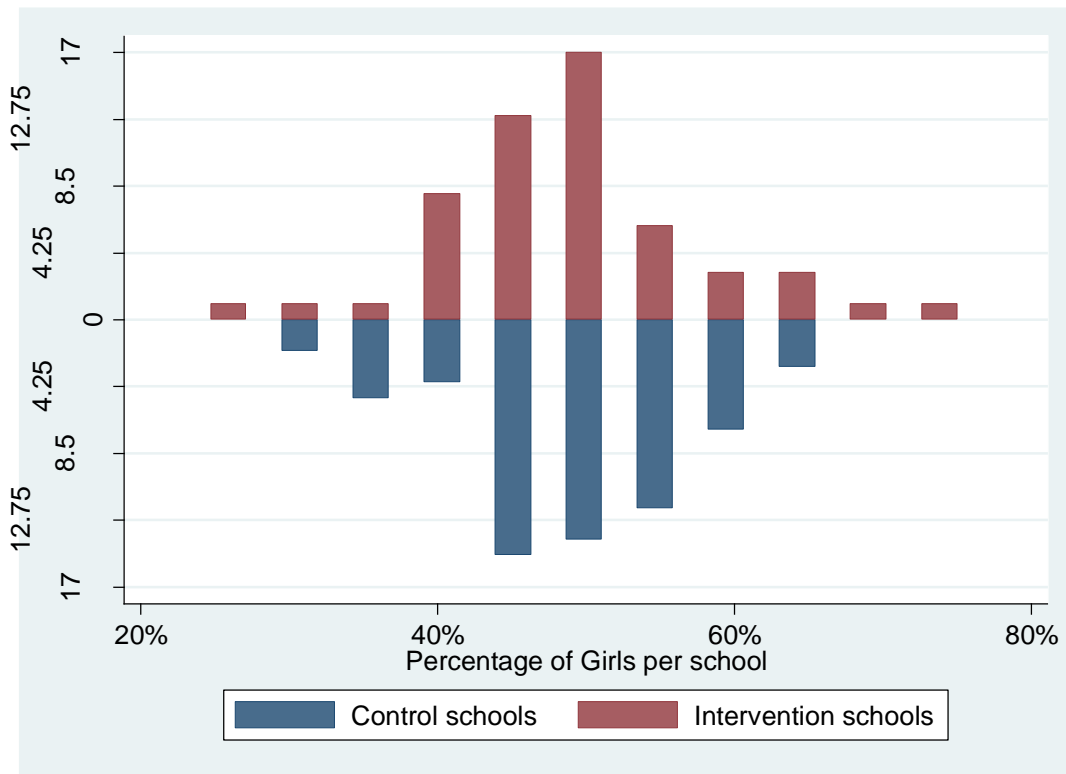jonathan.kay@eefoundation.org.uk

www.educationendowmentfoundation.org.uk

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Appendix D: Baseline equivalence

The figures below show the distribution of the school means.
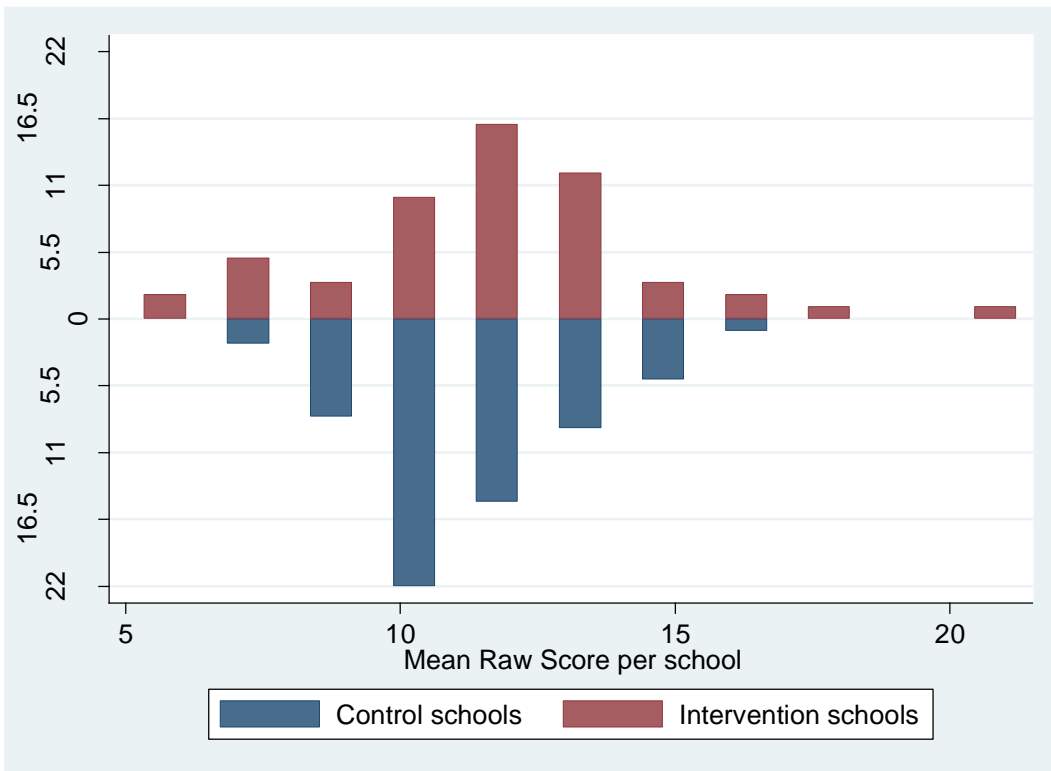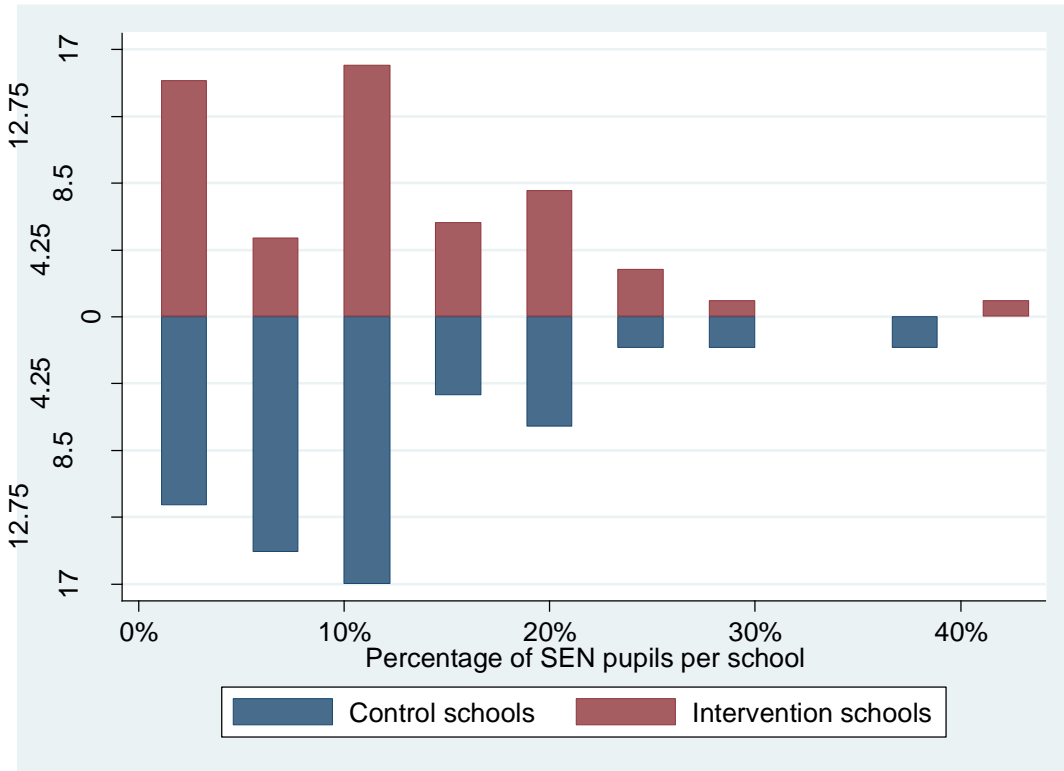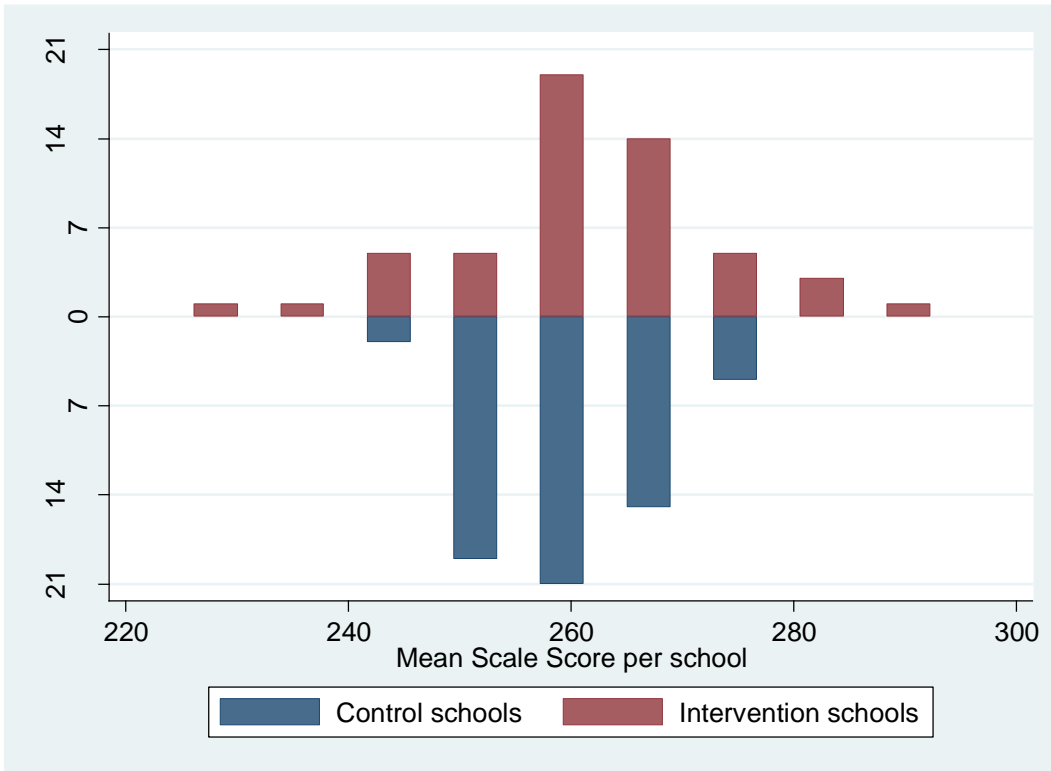
Appendix E: Classroom observation tool

Classroom Observation Protocol for Maximising Impact of Teaching Assistants - MITA

Date and time of observation:

1) **Background information**
    a. Observer Name:

    b. Class No./name/section:

    c. Observer's location in the class:

    d. No. Pupils

    e. Teacher name

    f. TA name

2) **Classroom and background**
    a. Room location and layout (e.g., type of student seating, teacher in front of or around the class, etc.).

    b. Note if there is any atypical about the class (avoid observing classes that are atypical)

    c. Any other comment.

3) **Observation matrix**
Please fill in the matrix in the next page indicating following the instructions below.

Time interval (min)	STAFF OBSERVATION																							PUPIL OBSERVATION														
	PREDOMINANT ACTIVITY OF TEACHER (size code: S, L) (attainment code: H, A, L, MU)							PREDOMINANT ACTIVITY OF TA 1 Class based 1:1 (please circle) (size code: S, L) (attainment code: H, A, L, M U)								PREDOMINANT ACTIVITY OF TA 2 Class based 1:1 (please circle) (size code: S, L) (attainment code: H, A, L, M U)								AVERAGE ATTAINMENT INTERACTION WITH (Code – I//P/Lg / SG /C)					LOW ATTAINMENT INTERACTION WITH (Code - I/P/LG / SG/ C)					SEN SUPPORT INTERACTION WITH (Code - I/P/LG / SG /C)				
	Teaching whole class	With pupil one to one	With group of pupils *	Roving classroom	Co-teaching	Other task	Bin	With pupil one to one	With group of pupils *	Roving classroom	Listening to teacher teach	Co-teaching	Other task	Bin	With pupil one to one	With group of pupils *	Roving classroom	Listening to teacher teach	Co teaching	Other task	Bin	Teacher	TA	Peer	No interaction	Bin / other	Teacher	TA	Peer	No interaction	Bin / other	Teacher	TA	Peer	No interaction	Bin / other
e.g.			LH						SL							SU						C					C						I			
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Group size: Small (S) = 2-5pupils   Large (L) = 6-10 pupils

I – Individual; P – Pair; LG – Large group; SG – Small group; C – Class

Group / pupil attainment: H = high; A = average; L = low; M = mixed; U = unsure

Time interval (min)	STAFF OBSERVATION																									PUPIL OBSERVATION															
	PREDOMINANT ACTIVITY OF TEACHER (size code: S, L) (attainment code: H, A, L, M U)							PREDOMINANT ACTIVITY OF TA 1 Class based 1:1 (please circle) (size code: S, L) (ability code: H, A, L, M U)							PREDOMINANT ACTIVITY OF TA 2 Class based 1:1 (please circle) (size code: S, L) (ability code: H, A, L, M U)							AVERAGE ATTAINMENT INTERACTION WITH (Code – I//P/LG / SG /C)					LOW ATTAINMENT INTERACTION WITH (Code - I/P/LG / SG/ C)					SEN INTERACTION WITH (Code - I/P/LG / SG /C)				
	Teaching whole class	With pupil one to one	With group of pupils *	Roving classroom	Co-teaching	Other task	Bin	With pupil one to one	With group of pupils *	Roving classroom	Listening to teacher teach	Co-teaching	Other task	Bin	With pupil one to one	With group of pupils *	Roving classroom	Listening to teacher teach	Co teaching	Other task	Bin	Teacher	TA	Peer	No interaction	Bin / other	Teacher	TA	Peer	No interaction	Bin / other	Teacher	TA	Peer	No interaction	Bin / other
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Group size: Small (S) = 2-5pupils Large (L) = 6-10 pupils   **I – Individual; P – Pair; LG – Large group; SG – Small group; C – Class**

Group / pupil attainment: H = high; A = average; L = low; M = mixed; U = unsure

4) Instructions

This systematic observation schedule describes the activities of pupils and staff on a minute-by-minute basis, to be recorded on a rigorous, objective and replicable description of behaviour and the contexts in which it occurs. The researcher must code across the schedule at 10 second intervals, based on observation of the predominant activities of the adults and the interactions experienced by the pupils.

The minute-by-minute observation process

You will notice that the 'time interval' column divides the observation sheet into one-minute intervals (rows). The actual timeframe for codeable observations is at each ten seconds. You code each of the six columns, once during each minute.

Once you are practised at coding, you will easily be able to code at each tenth second, whilst giving you good time to observe the activity or interaction and reflect on the most appropriate code.

Coding should be straightforward. Your main task is to capture the *interactions* that the target experiences and the predominant activity of each adult during each observation interval. For the best part you will be coding occurrences of *verbal interactions*. You will typically see that a verbal interaction has occurred, but not necessarily hear its content. But this is fine; we only need you to record that a verbal interaction has taken place – not the nature of what was said.

Some of the interactions you may observe will be *non-verbal interactions*. For example, a TA may point to the target's textbook to draw their attention to something in particular; or the pupil sat next to the target may nudge them as they secretly share a joke. These interactions can be very subtle, so you will not always spot them (should they occur in the observation interval). This too is fine. If you have any doubts about how to apply the observation codes, you can use the 'bin' category, which we explain below.

Binning observations

Before we go any further, it is worth admitting that systematic observation is not an exact science! It is impossible to capture and code behaviours with 100% accuracy, 100% of the time, across multiple sites and using many different observers. In lively and dynamic classrooms, unpredictable things can and do happen. There will be some situations and instances you observe that are 'messy' and difficult to code, because they do not fit neatly into our predefined category system. If you are unsure of what to code at a particular 10 second interval, you should use the 'bin' category and move onto the next. For the purposes of data entry and analysis, it is more useful to have a 'don't know' than to have missing data.

Making decisions

Coding systematic observations entails following a process, which we have set out in the diagram below. Your target is to spot predominant activity of teacher, TA$_1$ and (if applicable) TA$_2$. For teacher, TA$_1$ and TA$_2$ you have to notice if they are:

- Teaching whole class
- With pupil one to one
- With group of pupils (see codes for this below)
- Roving classroom
- Co-teaching (*Co-teaching may be seen where a TA is modelling an activity on behalf of a teacher or is at the front of the class with the teacher, perhaps demonstrating or scribing part of the lesson*)
- Other task
- Bin

Please circle at the top of TA columns whether they are working as a class based TA or in a 1:1 capacity (e.g perhaps directly with a pupil who has an EHCP plan or Statement of Special Educational Need)

To specify the group the teacher/TA is interacting with you will use a combination of code indicating size and ability:

- Group **size**: Small (S) = 2-5pupils   Large (L) = 6-10 pupils (*please note that any group of 11+ pupils should be coded as whole class teaching*)
- Group **attainment**: H = high; A = average; L = low; M = mixed; U = unsure

So, for instance, if teacher is working with a <u>small</u> group of <u>average</u> ability this would be coded as 'SA' and so on. The possible combinations are ten: SH, SA, SL, SM, SU / LH, LA, LL, LM, LU.

Similarly, for pupil observation you will have to notice if they are interacting with:

- Teacher,
- TA,
- Peer,
- No interaction,
- Bin/Other

So, let's say a pupil is interacting with the teacher by listening on the carpet as part of a whole class you would write C under teacher. Similarly, LG under peer if a pupil is talking to his/her partner whilst working as part of a larger group, or P under TA if a pupil is interacting with a TA with a partner.

Appendix F: Coding framework for audio recording

Table 1: Coding framework for TA talk strategies

1	Prompting waiting time (PW)	Pauses of 3 seconds or longer following a TA question or instruction before intervention by the TA. Also pauses following a pupil query about what to do which are 3 seconds or longer
2	Prompting verbal (PV)	Utterances which encourage the pupil to think more but do not give any additional input.
3	Clueing information (CINF)	A piece of information is provided directly to the pupil to help them move forward but does not give them the answer or the next move. For example, 'It's an animal with a long neck'
3	Clueing information (CINF)	A piece of information is provided directly to the pupil to help them move forward but does not give them the answer or the next move. For example, 'It's an animal with a long neck'
5	Clueing choice (CC)	A choice of two or more options is provided for the pupil to select from. For example, 'Is this an apple or a pear?'
6	Clueing incomplete utterances (CINC)	Utterances which start the response for the pupil, but the pupil needs to complete the sentence to move forward. For example: 'Now it's time for…'
7	Modelling (M)	The adult demonstrates for the pupil, normally while talking aloud in the first person. For example, 'I am using my finger to scan the words. I am looking for the word strong…'
8	Correcting answer (CORA)	The correct answer is given to pupil
9	Correcting instruction (CORI)	An instruction given as to the strategy to be used or the next move to be taken. For example, 'Sound it out'

Appendix G: Measure development: analytical approach

Secondary outcome measure: Change in practice measure

Table 2: Change in practice measure construction

Category	Aspect	Survey question	Coded	ALL AVERAGED, THEN: Scaled out of…
TA deployment (1)	TAs spend less time with pupils with SEND	TA survey Q4 – time spent (2nd) longest with group = SEND	0 if longest 1 if 2nd longest 2 if neither	30
	TAs spend less time with lower-attaining pupils	TA survey Q4 –group = Lower-attaining	As above	
	Teachers spend more time with pupils with SEND LONGEST	Teacher survey Q4 – with group = SEND	2 if longest 1 if 2nd longest 0 if neither	
	Teachers spend more time with lower-attaining pupils SECOND LONGEST	Teacher survey Q4 – group = Lower-attaining	As above	
Quality of TA preparation (2)	TAs' pre-lesson preparation	TA survey Q7	Aggregate score based on 7-point scale, with 5-point response options, coded from 4 (always) to 0 (never) in descending order; **all items 1, 2, 3 4, 5, 6,7**	30
		Teacher survey Q8	Equivalent to TAQ7, but from teachers' perspective, same items as **TAQ7, all items(1,2,3,4,5,6,7)**	
		TA Survey Q10	Code on sliding scale: I joined the lessons with a lesson plan and had clear information about my role (e.g. outcomes/objectives for pupils) = 3 I joined the lessons with a lesson plan, but had limited information about my role (e.g. only a list of pupils to support) = 2 I joined the lessons with a lesson plan, but had no information about my role/objectives for the lesson = 1 I joined the lessons without being provided with a lesson plan = 0	
		TA Survey Q11	Code on sliding scale: I planned and prepared with very little/no input from teachers = 1 I planned and prepared with some general guidance from teachers = 2 I planned and prepared with detailed guidance from teachers =3 I do not plan or prepare for any pupils within the lessons = 0	

		Teacher Survey Q11	Code on sliding scale: TA joined the lessons with a lesson plan and had clear information about my role (e.g. outcomes/objectives for pupils) = 3 TA joined the lessons with a lesson plan, but had limited information about my role (e.g. only a list of pupils to support) = 2 TA joined the lessons with a lesson plan, but had no information about my role/objectives for the lesson = 1 TA joined the lessons without being provided with a lesson plan = 0	
		Teacher Survey Q12	Coded on sliding scale: TA planned and prepared with very little input = 1 TA planned and prepared with some general guidance = 2 TA planned and prepared with detailed guidance = 3 TA did not plan or prepare = 0	
	Improvements in opportunities for and quality of teacher-TA liaison	TA survey Q6.-	Code on sliding scale: Teacher and I have scheduled time to meet = 3; I come into school early and/or stay behind after school. We use this as an opportunity to meet = 2 My communication with teacher(s) is brief and ad hoc (e.g. a couple of minutes before the lesson starts) =1 There is no opportunity or time to communicate with teacher(s) outside of lessons =0	
		Teacher survey Q7 -	Code on sliding scale: TA and I have scheduled time to meet = 3; I come into school early and/or stay behind after school. We use this as an opportunity to meet = 2 My communication with teacher(s) is brief and ad hoc (e.g. a couple of minutes before the lesson starts) =1 There is no opportunity or time to communicate with teacher(s) outside of lessons =0	

Survey items included in the construct:

(1) TA Deployment

TA Q4: Once again, thinking about what you did in your last three lessons, which **two groups of pupils did you spend the MOST time supporting**?

	Higher attaining pupils	Average attaining pupils	Lower attaining pupils (excluding SEND)	Pupils with SEND	Mixed attaining pupils
Group I spent the **LONGEST** time with	[]	[]	[]	[]	[]
Group I spent the **SECOND** longest time with	[]	[]	[]	[]	[]

Teacher Q4: Once again, thinking about what you did in your last three lessons, which **two groups of pupils did you spend the MOST time supporting**?

	Higher attaining pupils	Average attaining pupils	Lower attaining pupils (excluding SEND)	Pupils with SEND	Mixed attaining pupils
Group I spent the **LONGEST** time with	[]	[]	[]	[]	[]
Group I spent the **SECOND** longest time with	[]	[]	[]	[]	[]

(2) Quality of TA Pupil Interaction

TA Q7: Thinking about your daily work, for each of the areas listed below please indicate - on average - **how prepared do you feel when you come into lessons**?
Please mark one choice in each row.

	Always	Often	Sometimes	Rarely	Never
I know which pupil(s) I will support					
I am aware of the educational needs of the pupil(s) I will support					

	Always	Often	Sometimes	Rarely	Never
I know what topic will be covered in the lessons					
I have enough subject knowledge to provide effective support					
I have enough pedagogical/ instructional knowledge to provide effective support					
I am aware of the expected outcomes for the pupil(s) I will support					
I know what feedback I need to give to the teacher at the end of the lesson					

Teacher Q8: There are a number of things that can help TA(s) to be effective in lessons.
For each of the areas listed below, please indicate - on average - **how prepared you feel TA(s) are** when they come into your lessons.

Please mark <u>one</u> choice in each row.

	Always	Often	Sometimes	Rarely	Never
They know which pupil(s) they will support					
They are aware of the educational needs of the pupil(s) they will support					
They know what topic will be covered in the lesson					
They have enough subject knowledge to provide effective support					
They have enough pedagogical/instructional knowledge to provide effective support					
They are aware of the expected outcomes for the pupil(s) they will support					
They know what feedback you require from them					

TA Q10: Reflecting on the **last three lessons**, please select the option that best describes your preparation for these lessons.

I joined the lessons without being provided with a lesson plan	[]
I joined the lessons with a lesson plan, but had no information about my role/objectives for the lesson	[]

I joined the lessons with a lesson plan, but had limited information about my role (e.g. only a list of pupils to support)	[]
I joined the lessons with a lesson plan and had clear information about my role (e.g. outcomes/objectives for pupils)	[]

TA Q11: Reflecting on the **last three lessons**, how did you prepare to work with specific pupils?

I planned and prepared with very little/no input from teachers	[]
I planned and prepared with some general guidance from teachers	[]
I planned and prepared with detailed guidance from teachers	[]
I do not plan or prepare for any pupils within the lessons	[]

Teacher Q11: Reflecting on the **last three lessons** in which you had TA support, please select the option that best describes the preparation of TA(s) for these lessons:

The TA(s) joined the lessons without being provided with a lesson plan	[]	
The TA(s) joined the lessons with a lesson plan, but had no information about their role/objectives for the lesson	[]	
The TA(s) joined the lessons with a lesson plan, but had limited information about their role (e.g. only a list of pupils to support)	[]	
The TA(s) joined the lessons with a lesson plan and had clear information about their role (e.g. outcomes/objectives for pupils)	[]	

Teacher Q12: Reflecting on the **last three lessons** in which you had TA support, how did the TA(s) in your classroom prepare to work with specific pupils?

The TA(s) planned and prepared with very little/no input from teachers	[]
The TA(s) planned and prepared with some general guidance from teachers	[]
The TA(s) planned and prepared with detailed guidance from teachers	[]
The TA(s) do not plan or prepare for any pupils within the lessons	[]

TA Q6: We would like to know about the **opportunities you have to meet and communicate** with the teachers you work with.

Please select the statement below which best describes your experience

a. The teacher(s) and I have scheduled time to meet each week	[]
b. I come into school early and/or stay behind after school. We use this as an opportunity to meet	[]
c. My communication with teacher(s) is brief and ad hoc (e.g. a couple of minutes before the lesson starts)	[]
d. There is no opportunity or time to communicate with teacher(s) outside of lessons	[]

Teacher Q7: We would like to know about the **opportunities you have to meet and communicate** with the TA(s) you work with.

Please select the statement below which best describes your experience.

There is no opportunity or time to communicate with TA(s) outside of lessons	[]
My communication with TA(s) is brief and ad hoc (e.g. a couple of minutes before the lesson starts)	[]
TA(s) come into school early and/or stay behind after school. I use this as an opportunity to meet with them	[]
The TA(s) and I have scheduled time to meet each week	[]

Appendix H: Analysis code and output

Primary outcome analysis

```
xtmixed z_pooled_primary_outcome ib0.allocation ib4.strata z_pooled_prior_attainment ||
schoolname_supplied: if z_pooled_primary_outcome!=. & z_pooled_prior_attainment!=., mle vce(robust)
```

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log pseudolikelihood = -12476.306
Iteration 1: log pseudolikelihood = -12476.306

Computing standard errors:

```
Mixed-effects regression          Number of obs   =   10,777
Group variable: schoolname_s~d        Number of groups =     116

                          Obs per group:
                                    min =     14
                                    avg =   92.9
                                    max =    196

                          Wald chi2(9)   =  2317.44
Log pseudolikelihood = -12476.306        Prob > chi2    =  0.0000
```

(Std. Err. adjusted for 116 clusters in schoolname_supplied)
```
------------------------------------------------------------------------------
                       |          Robust
z_pooled_primary_outcome |   Coef.  Std. Err.   z   P>|z|   [95% Conf. Interval]
-------------------------+----------------------------------------------------
            allocation |
    Tr. school [MITA] |  -.0008363  .0350874  -0.02  0.981  -.0696064   .0679338
                       |
                strata |
    London+Hi KS2 |   .0577275  .0803352   0.72  0.472  -.0997267   .2151817
    London+Lo KS2 |  -.1206113  .0818296  -1.47  0.140  -.2809944   .0397718
 Portsmouth+Hi KS2 |  -.0032358  .1069463  -0.03  0.976  -.2128467   .2063752
    Suffolk+Hi KS2 |  -.0672323  .1342203  -0.50  0.616  -.3302992   .1958346
    Suffolk+Lo KS2 |  -.1422548  .122179   -1.16  0.244  -.3817212   .0972116
  West Mids+Hi KS2 |  -.0613944  .0892556  -0.69  0.492  -.2363323   .1135434
  West Mids+Lo KS2 |  -.1282708  .0944953  -1.36  0.175  -.3134781   .0569365
                       |
z_pooled_prior_attainment |   .6221417  .0145807  42.67  0.000   .5935641   .6507193
                _cons |   .0396926  .077035    0.52  0.606  -.1112932   .1906785
------------------------------------------------------------------------------
```

```
--------------------------------------------------------------------------
                       |          Robust
 Random-effects Parameters |  Estimate  Std. Err.   [95% Conf. Interval]
-------------------------+------------------------------------------------
schoolname~d: Identity   |
            sd(_cons) |  .1679848  .0130534   .1442536   .19562
-------------------------+------------------------------------------------
            sd(Residual) |  .7633129  .0065572   .7505686   .7762736
--------------------------------------------------------------------------
```

Secondary outcome analysis: Math attainment

```
 xtmixed ks2_matscore_num ib0.allocation ib4.strata ks1_matpoints ks1_readwritpoints ||
schoolname_supplied: i
> f z_pooled_primary_outcome!=. & z_pooled_prior_attainment!=., mle vce(robust)
```

Performing EM optimization:

Performing gradient-based optimization:

```
Iteration 0:  log pseudolikelihood = -17983.716
Iteration 1:  log pseudolikelihood = -17983.716
```

Computing standard errors:

```
Mixed-effects regression            Number of obs    =   5,976
Group variable: schoolname_s~d         Number of groups =    109

                        Obs per group:
                                 min =     10
                                 avg =   54.8
                                 max =    112


                        Wald chi2(10)   =  2183.10
Log pseudolikelihood = -17983.716        Prob > chi2   =  0.0000
```

(Std. Err. adjusted for 109 clusters in schoolname_supplied)

ks2_matscore_num	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
allocation						
Tr. school [MITA]	-.3514523	.3763402	-0.93	0.350	-1.089066	.3861611
strata						
London+Hi KS2	1.72293	.5873724	2.93	0.003	.5717016	2.874159
London+Lo KS2	.2421589	.6405665	0.38	0.705	-1.013328	1.497646
Portsmouth+Hi KS2	.5501033	.7303179	0.75	0.451	-.8812936	1.9815
Suffolk+Hi KS2	-.7788434	1.102235	-0.71	0.480	-2.939184	1.381497
Suffolk+Lo KS2	-.9530938	1.330648	-0.72	0.474	-3.561116	1.654928
West Mids+Hi KS2	-.1153477	.7093575	-0.16	0.871	-1.505663	1.274967
West Mids+Lo KS2	-.0367032	.7532639	-0.05	0.961	-1.513073	1.439667
ks1_matpoints	1.170508	.034099	34.33	0.000	1.103675	1.23734
ks1_readwritpoints	.3784497	.0379312	9.98	0.000	.3041059	.4527935
_cons	79.6671	.827978	96.22	0.000	78.0443	81.28991

Random-effects Parameters	Estimate	Robust Std. Err.	[95% Conf. Interval]	
schoolname~d: Identity				
sd(_cons)	1.778897	.1293662	1.542585	2.05141
sd(Residual)	4.814263	.0746807	4.670094	4.962882

Secondary outcome analysis: Engagement Y3

```
. mixed engagement_sum treatment i.strata || mlm_id:, mle vce(robust)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0:   log pseudolikelihood =  -5265.982
Iteration 1:   log pseudolikelihood = -5265.9557
Iteration 2:   log pseudolikelihood = -5265.9557

Computing standard errors:

Mixed-effects regression                        Number of obs      =       1,337
Group variable: mlm_id                          Number of groups   =          33

                                                Obs per group:
                                                              min =           4
                                                              avg =        40.5
                                                              max =         110

                                                Wald chi2(6)       =           .
Log pseudolikelihood = -5265.9557               Prob > chi2        =           .
```

                                    (Std. Err. adjusted for 33 clusters in mlm_id)

| | | Robust | | | | |
engagement_sum	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
treatment	-2.616763	1.004239	-2.61	0.009	-4.585035	-.6484914
strata						
London+Lo KS2	-1.09241	1.100562	-0.99	0.321	-3.249473	1.064653
Portsmouth+Hi KS2	-.4169181	1.50293	-0.28	0.781	-3.362606	2.52877
Portsmouth+Lo KS2	2.407388	.7625302	3.16	0.002	.9128561	3.90192
Suffolk+Lo KS2	-3.447969	.7625302	-4.52	0.000	-4.942501	-1.953437
West Mids+Hi KS2	-1.069356	1.427054	-0.75	0.454	-3.86633	1.727618
West Mids+Lo KS2	1.391751	1.254368	1.11	0.267	-1.066765	3.850268
_cons	70.25223	1.102769	63.71	0.000	68.09085	72.41362

| | | Robust | | |
Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
mlm_id: Identity				
var(_cons)	1.280754	1.092468	.2406584	6.816013
var(Residual)	153.308	10.92584	133.3221	176.29

Secondary outcome analysis: Engagement Y6

```
. mixed engagement_sum treatment i.strata || mlm_id:, mle vce(robust)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0:   log pseudolikelihood = -3821.3972
Iteration 1:   log pseudolikelihood = -3821.1314
Iteration 2:   log pseudolikelihood = -3821.1314

Computing standard errors:

Mixed-effects regression                        Number of obs      =       1,001
Group variable: mlm_id                          Number of groups   =          23

                                                Obs per group:
                                                              min =          10
                                                              avg =        43.5
                                                              max =          83

                                                Wald chi2(7)       =           .
Log pseudolikelihood = -3821.1314               Prob > chi2        =           .

                                (Std. Err. adjusted for 23 clusters in mlm_id)
```

engagement_sum	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
treatment	-2.473013	.7646478	-3.23	0.001	-3.971695	-.974331
strata						
London+Lo KS2	.3823819	1.176447	0.33	0.745	-1.923412	2.688176
Portsmouth+Hi KS2	-2.336029	2.042207	-1.14	0.253	-6.338682	1.666624
Portsmouth+Lo KS2	1.328253	.8697942	1.53	0.127	-.3765127	3.033018
Suffolk+Hi KS2	5.552038	1.372875	4.04	0.000	2.861252	8.242824
Suffolk+Lo KS2	.3593097	.6593013	0.54	0.586	-.9328971	1.651517
West Mids+Hi KS2	-3.944381	1.0256	-3.85	0.000	-5.954519	-1.934243
West Mids+Lo KS2	-.3924857	.6911305	-0.57	0.570	-1.747076	.9621052
_cons	88.9909	.8697942	102.31	0.000	87.28613	90.69566

Random-effects Parameters	Estimate	Robust Std. Err.	[95% Conf. Interval]	
mlm_id: Identity				
var(_cons)	8.04e-09	7.21e-07	4.24e-85	1.52e+68
var(Residual)	121.1163	10.13486	102.7957	142.702

Secondary outcome: Change in practice measure

```
. reg change_measure_final treatment
```

Source	SS	df	MS		Number of obs	=	69
					F(1, 67)	=	2.00
Model	1.00454324	1	1.00454324		Prob > F	=	0.1618
Residual	33.6339956	67	.501999934		R-squared	=	0.0290
					Adj R-squared	=	0.0145
Total	34.6385388	68	.509390277		Root MSE	=	.70852

change_mea~l	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
treatment	.253336	.1790872	1.41	0.162	-.1041235	.6107956
_cons	-.1699114	.1446259	-1.17	0.244	-.4585859	.1187632

Subgroup analysis: FSM

xtmixed z_pooled_primary_outcome /*ib0.allocation*/ ib4.strata z_pooled_prior_attainment
ib3.FSMinter || schoolname_s
> upplied: if z_pooled_primary_outcome!=. & z_pooled_prior_attainment!=., mle vce(robust)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0:   log pseudolikelihood = -12424.449
Iteration 1:   log pseudolikelihood = -12424.449

Computing standard errors:

Mixed-effects regression   Number of obs   =   10,771
Group variable: schoolname_s~d   Number of groups =   116

                        Obs per group:
                              min =   14
                              avg =   92.9
                              max =   196

                        Wald chi2(11)   = 2541.71
Log pseudolikelihood = -12424.449   Prob > chi2   =   0.0000

                (Std. Err. adjusted for 116 clusters in schoolname_supplied)

                      | Robust
z_pooled_primary_outcome | Coef. Std. Err.   z   P>|z| [95% Conf. Interval]
-------------------------+--
            strata |
    London+Hi KS2 | .0552455 .0816867   0.68 0.499 -.1048576 .2153485
    London+Lo KS2 | -.112173 .0824614 -1.36 0.174 -.2737944 .0494483
 Portsmouth+Hi KS2 | -.0141298 .1066597 -0.13 0.895   -.223179 .1949195
    Suffolk+Hi KS2 | -.0870016 .1317793 -0.66 0.509 -.3452842 .1712811
    Suffolk+Lo KS2 | -.1465181 .1272402 -1.15 0.250 -.3959044 .1028681
  West Mids+Hi KS2 | -.0717661 .091216 -0.79 0.431 -.2505463 .107014
  West Mids+Lo KS2 | -.1160268 .0945396 -1.23 0.220 -.3013211 .0692675
                      |
z_pooled_prior_attainment | .6134587 .0141026 43.50 0.000 .5858181 .6410992
                      |
          FSMinter |
  non-FSM/treatment | .1715984 .0453656   3.78 0.000 .0826834 .2605134
   non-FSM/control | .1651188 .0282191   5.85 0.000 .1098103 .2204273
    FSM/treatment | -.0155415 .0489426 -0.32 0.751 -.1114672 .0803841
                      |
            _cons | -.0870611 .0804578 -1.08 0.279 -.2447555 .0706333

                      | Robust
 Random-effects Parameters | Estimate Std. Err.   [95% Conf. Interval]
-----------------------------+--
schoolname~d: Identity |
          sd(_cons) | .1642783 .0139643   .1390673 .1940598
-----------------------------+--
          sd(Residual) | .7602529 .0065322   .7475573 .7731642

24

Subgroup analysis: SEND

```
. xtmixed z_pooled_primary_outcome /*ib0.allocation*/ ib4.strata
z_pooled_prior_attainment ib3.SENinter || schoolname_s
> upplied: if z_pooled_primary_outcome!=. & z_pooled_prior_attainment!=., mle vce(robust)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0:  log pseudolikelihood = -12298.07
Iteration 1:  log pseudolikelihood = -12298.07

Computing standard errors:

Mixed-effects regression              Number of obs   =   10,774
Group variable: schoolname_s~d        Number of groups =      116

                        Obs per group:
                               min =      14
                               avg =    92.9
                               max =     196

                    Wald chi2(11)   =  3002.35
Log pseudolikelihood = -12298.07       Prob > chi2     =   0.0000

                (Std. Err. adjusted for 116 clusters in schoolname_supplied)
---------------------------------------------------------------------------------------
                     |            Robust
 z_pooled_primary_outcome |   Coef.  Std. Err.   z   P>|z|   [95% Conf. Interval]
-------------------------+-------------------------------------------------------------
               strata |
      London+Hi KS2 |  .0596703  .0828982   0.72  0.472  -.1028073  .2221478
      London+Lo KS2 | -.1167899  .0848626  -1.38  0.169  -.2831176  .0495378
  Portsmouth+Hi KS2 | -.0017036  .1088756  -0.02  0.988  -.2150959  .2116888
     Suffolk+Hi KS2 | -.0768686  .1310626  -0.59  0.558  -.3337466  .1800093
     Suffolk+Lo KS2 | -.1506695  .1188952  -1.27  0.205     -.3837  .0823609
   West Mids+Hi KS2 |  -.074042  .0921786  -0.80  0.422  -.2547088  .1066247
   West Mids+Lo KS2 |  -.125393  .0953048  -1.32  0.188  -.3121869   .061401
                     |
 z_pooled_prior_attainment |  .5700244  .0146441  38.93  0.000  .5413225  .5987263
                     |
             SENinter |
  non-SEN/treatment |  .4539656   .055804   8.13  0.000   .3445917  .5633395
      non-SEN control |  .4579436  .0413999  11.06  0.000   .3768013  .5390859
        SEN/treatment |    .05173  .0657988   0.79  0.432  -.0772332  .1806933
                     |
               _cons | -.3567881  .0875786  -4.07  0.000  -.5284391 -.1851372
---------------------------------------------------------------------------------------


-------------------------------------------------------------------------------
                     |            Robust
 Random-effects Parameters |  Estimate  Std. Err.   [95% Conf. Interval]
-----------------------------+-------------------------------------------------
schoolname~d: Identity     |
           sd(_cons) |  .1636679  .0125067    .1409026  .1901114
-----------------------------+-------------------------------------------------
           sd(Residual) |  .7510935   .006251    .7389412  .7634456
-------------------------------------------------------------------------------
```

Missing data analysis

Logistic regression

```
--------------------------------------------------------------------------------
      missing_data | Odds Ratio  Std. Err.      z    P>|z|    [95% Conf. Interval]
-------------------+------------------------------------------------------------
        allocation |
   Tr. school [MITA]|  .8283695   .1694712   -0.92   0.357    .5547302    1.236991
                   |
            strata |
      London+Hi KS2 |  .8516911   .2796997   -0.49   0.625    .4474486    1.621142
      London+Lo KS2 |  1.021522   .3449638    0.06   0.950    .5269878    1.980136
   Portsmouth+Hi KS2|  .5709828   .3211631   -1.00   0.319    .1896025    1.719499
      Suffolk+Hi KS2|  .9480403   .7158947   -0.07   0.944    .2158033    4.164813
      Suffolk+Lo KS2|         1   (empty)
    West Mids+Hi KS2|  2.084966   .8396218    1.82   0.068    .9469297    4.590715
    West Mids+Lo KS2|  .7718041   .2862497   -0.70   0.485     .373087    1.596629
                   |
   1.everfsm_6_spr19|  1.317926   .2745963    1.32   0.185    .8760708    1.982637
        1.senpupilid|  39.13108   16.73707    8.57   0.000    16.92184    90.48908
z_pooled_prior_attainment| .2671031  .027168  -12.98   0.000    .2188267    .3260301
              _cons|  .0003238   .0001671  -15.57   0.000    .0001178    .0008902
--------------------------------------------------------------------------------
```

FIML

```
. sem (z_pooled_primary_outcome <- allocation strata z_pooled_prior_attainment), method (mlmv)
note: Missing values found in observed exogenous variables. Using the noxconditional behavior. Specify the forcexconditional
      option to override this behavior.
Endogenous variables

Observed:  z_pooled_primary_outcome

Exogenous variables

Observed:  allocation strata z_pooled_prior_attainment

Fitting saturated model:

Iteration 0:   log likelihood = -66966.297
Iteration 1:   log likelihood = -66906.545
Iteration 2:   log likelihood = -66905.878
Iteration 3:   log likelihood = -66905.878

Fitting baseline model:

Iteration 0:   log likelihood = -69336.962
Iteration 1:   log likelihood = -69333.723
Iteration 2:   log likelihood = -69333.711
Iteration 3:   log likelihood = -69333.711

Fitting target model:

Iteration 0:   log likelihood = -66905.878
Iteration 1:   log likelihood = -66905.878

Structural equation model              Number of obs    =     12,152
Estimation method  = mlmv
Log likelihood     = -66905.878
```

```
--------------------------------------------------------------------------------
                             |           OIM
                             |  Coef.   Std. Err.     z    P>|z|    [95% Conf. Interval]
-----------------------------+--------------------------------------------------
Structural                   |
 z_pooled_primary_outcome    |
                  allocation | -.0120204  .0154741   -0.78   0.437   -.0423491    .0183082
                      strata | -.0167217  .0029145   -5.74   0.000   -.0224341   -.0110094
 z_pooled_prior_attainment   |  .6290741  .0080365   78.28   0.000    .6133229    .6448253
                       _cons |  .0548863  .0150301    3.65   0.000    .0254279    .0843447
-----------------------------+--------------------------------------------------
           mean(allocation)  |  .4811743  .0045426  105.93   0.000     .472271    .4900776
               mean(strata)  |  3.516129  .0236307  148.80   0.000    3.469814    3.562444
 mean(z_pooled_prior_attainment)| -.0001876  .0090538  -0.02   0.983   -.0179327    .0175574
-----------------------------+--------------------------------------------------
  var(e.z_pooled_primary_outcome)|  .6113969  .0085266                 .5949113    .6283393
             var(allocation)  |   .249645  .0032098                 .2434325    .2560161
                 var(strata)  |  6.785783  .0870545                 6.617287     6.95857
 var(z_pooled_prior_attainment)|  .9961059   .012779                 .9713718     1.02147
-----------------------------+--------------------------------------------------
       cov(allocation,strata)| -.0230863  .0118267   -1.95   0.051   -.0462661    .0000935
cov(allocation,z_pooled_prior_attainment)|  .0227004  .0045389   5.00   0.000    .0138044    .0315964
 cov(strata,z_pooled_prior_attainment)| -.1055932  .0236041   -4.47   0.000   -.1518563     -.05933
--------------------------------------------------------------------------------
LR test of model vs. saturated: chi2(0)   =      0.00, Prob > chi2 =      .
```

Appendix I: MITA Reviewer checklist

Maximising the Impact of Teaching Assistants (MITA) project

MITA Reviewer post-visit checklist – VISIT 1

Why are we asking these questions?

In the world of evidence-informed practice, it's becoming increasingly clear that *how* schools implement a programme is a strong determinant of overall success; equally as strong as the quality of the training and support they receive. There are things we think schools should be doing to give MITA the best chance of success, and we predict we'll see greater success in the schools that implement the guidance, etc. with greater faith and fidelity than those that don't. Seems obvious, but we nonetheless need to track the components of fidelity over the course of the year to help us understand more about how and why MITA works.

What do Reviewers need to do?

In most cases, you'll have a closer relationship with the school than the MITA team or the evaluation team. You'll also have a sense, based on your professional experience and judgement, of how well things are going for them. We need to tap into that to help us collect data on implementation fidelity. After each school visit, we'd like you to complete a short checklist to help us collect these data.

1. **Was a date for the school visit set at least two weeks in advance?**

    Yes
    No

2. **If No, what was the reason.**

3. **Were the following items available or sent in advance of your visit? Tick all that apply.**

    TA Audit report (SLT self-evaluation)
    Staff survey results report
    Timetable for Reviewer's visit to school
    Session 1 homework (e.g. shared vision; info about MITA development team)
    School development/improvement plan
    Evidence from a previous review of TA deployment/skills
    TA deployment and/or recruitment policy
    TA job descriptions or role profiles
    Information relating to TA Induction and/or CPD
    Information relating to SEND (e.g. policy; provision map; information report)
    Information relating to Pupil Premium (e.g. PP statement)
    Ofsted report
    Other (please specify):

4. **Please specify the components of the Review visit. Tick all that apply.**

   Meeting with member(s) of SLT
   Meeting with the school's MITA Project Development Team
   Tour of the school
   Learning walk
   Observation (whole class lesson)
   Observation (intervention/small group/one-to-one session)
   Paperwork scrutiny (e.g. policies; job descriptions; timetables)
   Observation of unstructured activities involving TAs (e.g. break-time)
   Observation in SEND resource provision where TAs work
   Focus group/interview with teachers
   Focus group/interview with TAs
   Focus group/interview with pupils
   Focus group/interview with parents

5. **Were school staff/pupils/parents informed of your visit?**

School staff	Pupils	Parents
Yes	Yes	Yes
No	No	No
Unable to say	Unable to say	Unable to say

The expectation is that the Headteacher will lead the MITA Project in their school. However, some Heads may delegate this responsibility to another member of staff.

6. **Is the Headteacher the MITA Project Lead (e.g. do they lead the Development Team)?**

   Yes   (go to Q10)
   No   (go to next Q)

7. **If No, which member of staff is the MITA Project Lead. Please indicate their role:**

   Deputy or Assistant Headteacher
   SENCO/Inclusion Coordinator
   Phase/year/subject leader
   Other (please specify):

8. **Is the MITA Project Lead part of the senior leadership team?**

   Yes
   No
   Don't know

9. If an explanation has been provided for why the Headteacher is <u>not</u> the Project Lead, please add it here:

10. In your judgement, is the Headteacher sufficiently involved in the MITA Project in their setting?

Yes	(go to Q12)
No	(go to next Q)
Not clear at this stage	(go to Q12)

11. In your judgement, could the Headteacher's lack of involvement be detrimental to the success of the MITA Project in this school?

Yes
No
Not clear at this stage

12. Please specify the level of involvement of the Headteacher and/or the MITA Project Lead during the school visit. Tick one level of engagement per person.

Level of engagement	Headteacher	MITA Project Lead (If Lead is not Head)
Involved for all relevant parts of visit		
Involved for most relevant parts of visit		
Involved for a few relevant parts of visit		
Was not involved in the visit		

13. If the <u>Headteacher</u> was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority):

14. If the <u>MITA Project Lead</u> was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority). *Only complete this question if the Project Lead is someone other than the Headteacher.*

15. Progress with homework tasks:

    a) Has the Headteacher informed the whole staff of the school's involvement in the MITA project? This should have been done before the first Reviewer visit.

        Yes
        No

    b) Has the school formed a MITA Project Development Team?

        Yes
        No
        No, but this is scheduled to be complete by SLT session 2

    c) Has the school completed the visioning exercise? (Draft form is fine).

        Yes
        No
        No, but this is scheduled to be complete by SLT session 2

16. Has a date been agreed for the next Reviewer visit?

        Yes   (go to next Q)
        No   (go to Q18)

17. If Yes, please add date of next Reviewer visit:

18. Please add any further comments in relation to the school's commitment to the project or fidelity to the MITA processes and principles:

NEXT STEPS:

Thanks for completing this checklist. These responses are an integral part of the data collection for the MITA project.

Please now complete your Notes of Visit report, and email to Tash (email address) by **20th October 2017**.

Please attach to your email a copy of the school's visioning exercise document.

Maximising the Impact of Teaching Assistants (MITA) project

MITA Reviewer post-visit checklist – VISIT 2

Why are we asking these questions?
In the world of evidence-informed practice, it's becoming increasingly clear that *how* schools implement a programme is as strong a determinant of success as the quality of the training and support they receive. There are things we think schools should be doing to give MITA the best chance of success, and we predict we'll see greater success in the schools that implement the guidance, etc. with greater faith and fidelity than those that don't. Seems obvious, but we nonetheless need to track the components of fidelity over the course of the year to help us understand more about how and why MITA works.

What do Reviewers need to do?
In most cases, you'll have a closer relationship with the school than the MITA team or the evaluation team. You'll also have a sense, based on your professional experience and judgement, of how well things are going for them. We need to tap into that to help us collect data on implementation fidelity. After each school visit, we'd like you to complete a short checklist to help us collect these data.

1. **Was a date for the school visit set at least two weeks in advance?**

   Yes
   No

2. **If No, what was the reason.**

3. **Did the school send a copy of their MITA Action Plan in advance of your visit?**

   Yes
   No

4. **In your judgement, is the Headteacher sufficiently involved in the MITA Project in their setting?**

   Yes   (go to Q6)
   No   (go to next Q)
   Not clear at this stage   (go to Q6)

5. **In your judgement, could the Headteacher's lack of involvement be detrimental to the success of the MITA Project in this school?**

> Yes
> No
> Not clear at this stage

6. **Please specify the level of involvement of the Headteacher and/or the MITA Project Lead during the school visit. Tick one level of engagement per person.**

Level of engagement	Headteacher	MITA Project Lead (If Lead is not Head)
Involved for all relevant parts of visit		
Involved for most relevant parts of visit		
Involved for a few relevant parts of visit		
Was not involved in the visit		

7. **If the Headteacher was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority):**

8. **If the MITA Project Lead was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority).** *Only complete this question if the Project Lead is someone other than the Headteacher.*

9. **Progress with homework tasks from Sessions 1 and 2:**

a) Has the school drafted an action plan?

> Yes
> No

b) Has the Headteacher informed the whole staff of the school's involvement in the MITA project?

> Yes
> No

c) Has the school formed a MITA Project Development Team?

> Yes   (go to next Q)
> No   (go to Qe)

d) Has the MITA Project Development Team met at least once this term?

> Yes
> No

e) Has the school completed the visioning exercise? **If yes, please send a copy of the visioning exercise with your Notes of Visit.**

      Yes

      No

10. Has a date been agreed for the next Reviewer visit?

      Yes   (go to next Q)

      No   (go to Q12)

11. If Yes, please add date of next Reviewer visit:

12. Please add any further comments in relation to the school's commitment to the project or fidelity to the MITA processes and principles:

NEXT STEPS:

Thanks for completing this checklist. These responses are an integral part of the data collection for the MITA project.

Please now complete your Notes of Visit report, and email to Tash (email address) by

20th October 2017.

Please attach to your email a copy of the school's visioning exercise document.

Maximising the Impact of Teaching Assistants (MITA) project

MITA Reviewer post-visit checklist – VISIT 3

Why are we asking these questions?
In the world of evidence-informed practice, it's becoming increasingly clear that *how* schools implement a programme is a strong determinant of overall success; equally as strong as the quality of the training and support they receive. There are things we think schools should be doing to give MITA the best chance of success, and we predict we'll see greater success in the schools that implement the guidance, etc. with greater faith and fidelity than those that don't. Seems obvious, but we nonetheless need to track the components of fidelity over the course of the year to help us understand more about how and why MITA works.

What do Reviewers need to do?
In most cases, you'll have a closer relationship with the school than the MITA team or the evaluation team. You'll also have a sense, based on your professional experience and judgement, of how well things are going for them. We need to tap into that to help us collect data on implementation fidelity. After each school visit, we'd like you to complete a short checklist to help us collect these data.

1. **Was a date for the school visit set at least two weeks in advance?**

    Yes
    No

2. **If No, what was the reason.**

3. **Did the school send a copy of their MITA Action Plan in advance of your visit?**

    Yes
    No

4. **Please specify the components of the Review visit. Tick all that apply. Please note: there is no expectation that all of these components should have covered in Visit 3.**

    Meeting with member(s) of SLT
    Meeting with the school's MITA Project Development Team
    Tour of the school
    Learning walk
    Observation (whole class lesson)
    Observation (intervention/small group/one-to-one session)

Paperwork scrutiny (e.g. policies; job descriptions; timetables)
Observation of unstructured activities involving TAs (e.g. break-time)
Observation in SEND resource provision where TAs work
Focus group/interview with teachers
Focus group/interview with TAs
Focus group/interview with pupils

5. **In your judgement, is the Headteacher sufficiently involved in the MITA Project in their setting?**

Yes	(go to Q8)
No	(go to next Q)
Not clear at this stage	(go to Q8)

6. **In your judgement, could the Headteacher's lack of involvement be detrimental to the success of the MITA Project in this school?**

Yes
No
Not clear

7. **If Yes, please briefly describe the ways in which you feel the Headteacher's lack of involvement might be detrimental.**

8. **Please specify the level of involvement of the Headteacher and/or the MITA Project Lead during the school visit. Tick one level of engagement per person.**

Level of engagement	Headteacher	MITA Project Lead (if Lead is not Head)
Involved for all relevant parts of visit		
Involved for most relevant parts of visit		
Involved for a few relevant parts of visit		
Was not involved in the visit		

9. **If the <u>Headteacher</u> was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority):**

10. **If the <u>MITA Project Lead</u> was involved in only a few relevant parts of the visit or was not involved at all, please specify the reason why (e.g. illness; other meeting took priority).** *Only complete this question if the Project Lead is someone other than the Headteacher.*

11. Please briefly describe how you feel the school has managed the MITA project this year, and your level of confidence going forward. For example, do you think the school is set fair for next year, or is there any causes for concern?

12. **Has the school requested further Reviewer visits for the 2018/19 school year?**

        Yes   (go to next Q)
        No   (go to Q14)

13. **If Yes, please add date(s) of these Reviewer visit(s):**

14. **Please add any further comments in relation to the school's commitment to the project or fidelity to the MITA processes and principles:**

NEXT STEPS:

Thanks for completing this checklist. These responses are an integral part of the data collection for the MITA project.

Please now complete your Notes of Visit report, and email to Tash (email address) as soon as possible, and at the latest by 31st May 2018.

Please attach to your email a copy of the school's action plan.

This document is available for download at https://educationendowmentfoundation.org.uk

Education Endowment Foundation

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