

Independent Evaluation of the EasyPeasy programme

A two-arm 5 month randomised controlled trial

TRIAL PROTOCOL

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EVALUATION SUMMARY

Age range	Children aged 3+ years in nursery school classes
Number of pupils	1199 assessed at pre-test
Number of schools	102
Design	Two-armed (five month) cluster randomised controlled trial (random allocation at school level)
Primary Outcome	Children's language and communication development as measured by assessment Clinical Evaluation of Language Fundamentals Preschool 2 UK (CELF- Preschool 2 UK) pre- and post-intervention
Date of Protocol	08 May 2018
Version	2

Summary of amendments

The protocol was amended in April 2018 to incorporate staff changes, participant numbers and specific design details. (Please see Appendix A for the full list of amendments and reasons.)

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Table 1: Description of the intervention using The Template for Intervention Description Replication (TIDieR) framework

TIDieR* FRAMEWORK	DESCRIPTION
Name of intervention	EasyPeasy
Why? Rationale	<p>The attainment gap between the richest and the poorest pupils begins at an early age; before the start of school. Tackling this disparity early on is critical to breaking the cycle of disadvantage and improving social mobility.</p> <p>It is well documented that children from disadvantaged backgrounds have lower attainment on entry to school than those more socioeconomically advantaged (e.g. Tymms <i>et al.</i> 2014), with children's language and communication skills at this point being a good indicator of school readiness, as well as later educational attainment (e.g. Snow <i>et al.</i>, 1998). Hart and Risley (1995) have shown that by the age of four, children from disadvantaged backgrounds have been exposed to as many as 30 million fewer words than children from advantaged background. Bruner's (1975; 1983) and Vygotsky's (1962) understanding of the early learning environment is widely accepted. They both postulated that learning occurs in a socio-cultural context in which adult/caregivers 'scaffold' young children to higher levels of thinking and acting. In line with this view, children who experience a cognitively stimulating home environment early in development are at an advantage in the learning process. The quality of the early home learning environment is related to availability of quality educational resources (Melhuish <i>et al.</i> 2008), and evidence suggests disadvantaged households are associated with having lower quality educational resources (Foster <i>et al.</i> 2005). Early intervention at this stage, specifically in tailoring the activities parents do with their children, can have a positive impact on cognitive ability and later life outcome (Lugo-Gill and Tamis-LeMonda, 2008; 2008a, b) and whilst stimulating activities may help children with specific skills (e.g. linking letters to sounds) it may also develop the child's ability and motivation towards learning more generally (Melhuish 2010).</p> <p>Although there is extensive evidence of the link between early intervention and positive later outcomes, it can be difficult to get parents involved in their child's learning. Previous research by Jelley, Sylva & Karemaker (2016) has suggested that</p>

	<p>EasyPeasy is an effective way to improve parental engagement and through this, to accelerate children's cognitive development, in particular their self-regulation, and school readiness*.</p> <p>EasyPeasy is a smartphone programme for parents of preschool aged children. It is designed to improve early child development through increasing positive parent-child interactions and learning at home. EasyPeasy sends regular game ideas to parents that they can play with their children, combined with a text schedule which includes information on child development and explanation of each of the games. The design of EasyPeasy applies behavioural insights to help seed positive habits of play and interaction at home by sending tailored prompts, encouragement, and reminders to parents.</p> <p>Parents receive EasyPeasy communications via text message (SMS). Parents receive a series of videos via SMS which demonstrate games (weekly) and separate text explanations (known as the 'text schedule' of each game, encouraging them to play with their children.</p> <p>EasyPeasy also provides a function whereby the child's early years provider can track parental engagement with EasyPeasy and create digital communities for parents to communicate and share experiences of the EasyPeasy activities (Jelley <i>et al.</i> 2016).</p> <p>In a previous evaluation, Jelley <i>et al.</i>, (2016) reported that EasyPeasy led to moderate positive effects on parenting self-efficacy and on children's cognitive self-regulation (parental reports), an increase in parental consistency with discipline and boundaries and improvements to child concentration and persistence (parental reports). EasyPeasy presents as a low-cost, accessible, non-intrusive intervention that does not place great demands on parents' time or resources. As the content is evidence-based, covering all areas of the Early Years curriculum, EasyPeasy shows potential as a quality learning resource to support parents and positively impact on the home learning environment and early years attainment.</p>
Who? Recipients	<p>Intervention providers: EasyPeasy</p> <p>Primarily the intervention will be evaluated with children in nursery classes attached to state schools in England. Eligible children will be aged 3+ and due to enter Reception class in the academic year 2018/19.</p>

	<p>School level implementers/providers: At least one early years teacher will receive training from EasyPeasy to implement the programme within their setting, who will be responsible for the recruitment of parents into the programme and for the setting's pod administration used to foster continued parental engagement.</p> <p>At home providers: Parents are ultimately responsible for engaging with EasyPeasy and delivering the game contents to their children.</p>
What? Materials used	<p>Within each school, a teacher or nursery practitioner will be nominated as the 'Pod Leader' to oversee parental engagement with the EasyPeasy programme (described further in next section). The nominated Pod Leader will receive relevant training via webinar. Training will last one and a half hours and will provide instructions of how to facilitate EasyPeasy and navigate their school's 'Pod' (described further below) within their school to maximise parental engagement.</p> <p>Parents receive a SMS link to EasyPeasy via their mobile phone.</p> <p>Subsequent programme delivery is digital via the Pod Leader dashboard for teachers and via SMS messages containing links for parents.</p>
What? Procedures, activities and/or processes	<p>This section has been taken directly from Jelley (2016) with permission from EasyPeasy:</p> <p>EasyPeasy has been designed to integrate with local early years settings, such as children's centres, primary schools, and nurseries, and function as a digital outreach service that extends the reach and impact of the setting and practitioner workforce. A secondary desktop component allows practitioners in these settings to share and communicate with parents, as well as capture information on parent engagement. When used by settings, parents are typically organised into small groups or 'Pods', providing a virtual support network where they can discuss the games, and the challenges and successes of using them to engage their children. Each 'Pod' is overseen by a Pod Leader, a practitioner from the setting who monitors parents' progress and offers remote support.</p> <p>Parents receive EasyPeasy communications via text message (SMS). An initial SMS invites them to join EasyPeasy through a personalised message from their local practitioner or teacher, and includes a link to 'get started'. When the parent clicks on the link, they are taken to a personal dashboard that presents</p>

	<p>them with an initial bank of games to explore. Each game is presented through a short video clip, and a short set of written instructions. Parents will then receive a series of SMS reminders throughout the intervening weeks, releasing new games (weekly), and encouraging them to play with their children. In the school holidays, parents will receive an extra game.</p> <p>EasyPeasy games are shared with parents via short video clips that feature real families playing the games in their own living rooms. The clips are between one and three minutes long and include tips and hints through small 'pop up' animations.</p>
Who? Providers/implementers	<p>Intervention providers: EasyPeasy</p> <p>School level implementers/providers: At least one early years teacher, the 'Pod Leader', will receive training from EasyPeasy to implement the programme within their setting. The Pod Leader will then cascade training to their whole team of practitioners using training materials provided by EasyPeasy. The Pod Leader will be responsible for the recruitment of parents into the programme as well as for fostering continued parental engagement.</p> <p>At home providers: Parents are ultimately responsible for engaging with EasyPeasy and playing the games with their children.</p>
How? Mode of delivery	See above section for description of materials, processes and activities
Where? Location of delivery	<p>Local Authorities (LAs) will be approached and invited to participate in the research. The role of the LAs is to contribute to the funding of EasyPeasy, and to extend an invitation to participate to eligible schools in their area. Eligible schools are those that are state-funded, with nurseries that have provision for children 3+. Schools will be recruited that have a high percentage of pupils in receipt of free school meals (FSMEVER >30%).</p> <p>Schools with <30% FSMEVER or private, voluntary or independent (PVI) nurseries could be used as a back-up if recruitment of schools with preferred characteristics is problematic.</p>
When and how much? Duration and dosage	EasyPeasy delivers one different game per week, including a text schedule (providing explanation of how the games impact on child cognitive development) over a five month period. The text schedule is dynamic, and changes over the course of the

	20 weeks. Parents will receive 27 games in total over the delivery period.
Tailoring and adaptation	<p>EasyPeasy has been developed to be delivered over a one year period. For the purposes of this evaluation, EasyPeasy will deliver content (27 games) over 5 months/20 weeks to participating schools.</p> <p>Following the purchase of EasyPeasy it is usual practice that EasyPeasy would be offered to all parents via initial invitation text initiated by the setting. At this point parents can opt-out of receiving the programme by telling their Pod Leader. Within the context of this research project it is necessary for parents to provide written opt-in consent for their participation in the project on the assumption that their child's early years setting will receive the app in January 2018/February 2018 or September 2018. At this stage parents will also be requested to provide consent for their child to participate in pre-and post-intervention data collection and consent for their child's data to be shared between participating organisations. Parents will be given the option to agree to use EasyPeasy but not agree to participate in the evaluation.</p> <p>As EasyPeasy is a setting level programme parents of both nursery and reception aged children may choose to use EasyPeasy. Both nursery and reception children will be placed in one Pod, and managed by the trained Pod Leader(s)¹. It is important to note that the Pod may also include parents of children who do not fit the trial's eligibility criteria or who have agreed to use EasyPeasy but not agreed for their child to take part in the evaluation. As such, 'weekly pod reports' could contain data for all of these types of users.</p> <p>Pod Leader training will be conducted via an online webinar. (In the past, the EasyPeasy team provided face-to-face Pod Leader training. As EasyPeasy is scaling up, this is no longer possible. It is now standard practice for Pod Leaders to be trained via a webinar, rather than face-to-face.)</p> <p>Nursery teachers may choose to adapt the level of interaction with parents in relation to the EasyPeasy programme, e.g. linking lessons to games, talking to parents about engaging with the games.</p>

¹ Placing both nursery and reception children in one Pod is standard EasyPeasy practice. To have nursery and reception children in two separate Pods would be more time consuming for settings as they would have to have a separate Pod Leader assigned to manage each Pod, or one Pod Leader's time would be divided between two Pods.

<p>How well (planned?): strategies to maximize effectiveness</p>	<p>A wait-list incentive strategy will be adopted to increase school-level recruitment. Here, all schools will receive the intervention; schools randomly allocated to the intervention will receive the intervention in 2017-18, for schools randomly allocated to the control group they will receive the intervention in 2018-19 for use with their 3+ cohort. This ensures the 2017-18 control group of 3+ year old children do not ever receive the intervention. It is important to note that it is the 2017-18 cohort that is of interest within the context of this evaluation.</p> <p>The evaluation team and EasyPeasy team have worked collaboratively to develop parental information sheets and consent forms to thoroughly explain EasyPeasy (including its aims, how it works, simplicity of use, child-friendly) and evaluation components.</p> <p>EasyPeasy will provide quality training to Pod Leaders to maximise engagement with the programme from the beginning.</p> <p>EasyPeasy is simple and quick for parents to access and engage with, as is the Pod dashboard for Pod Leaders.</p>
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For this update to the protocol the following changes were made to the above table at the request of the EasyPeasy delivery team to more accurately reflect the intervention and delivery:

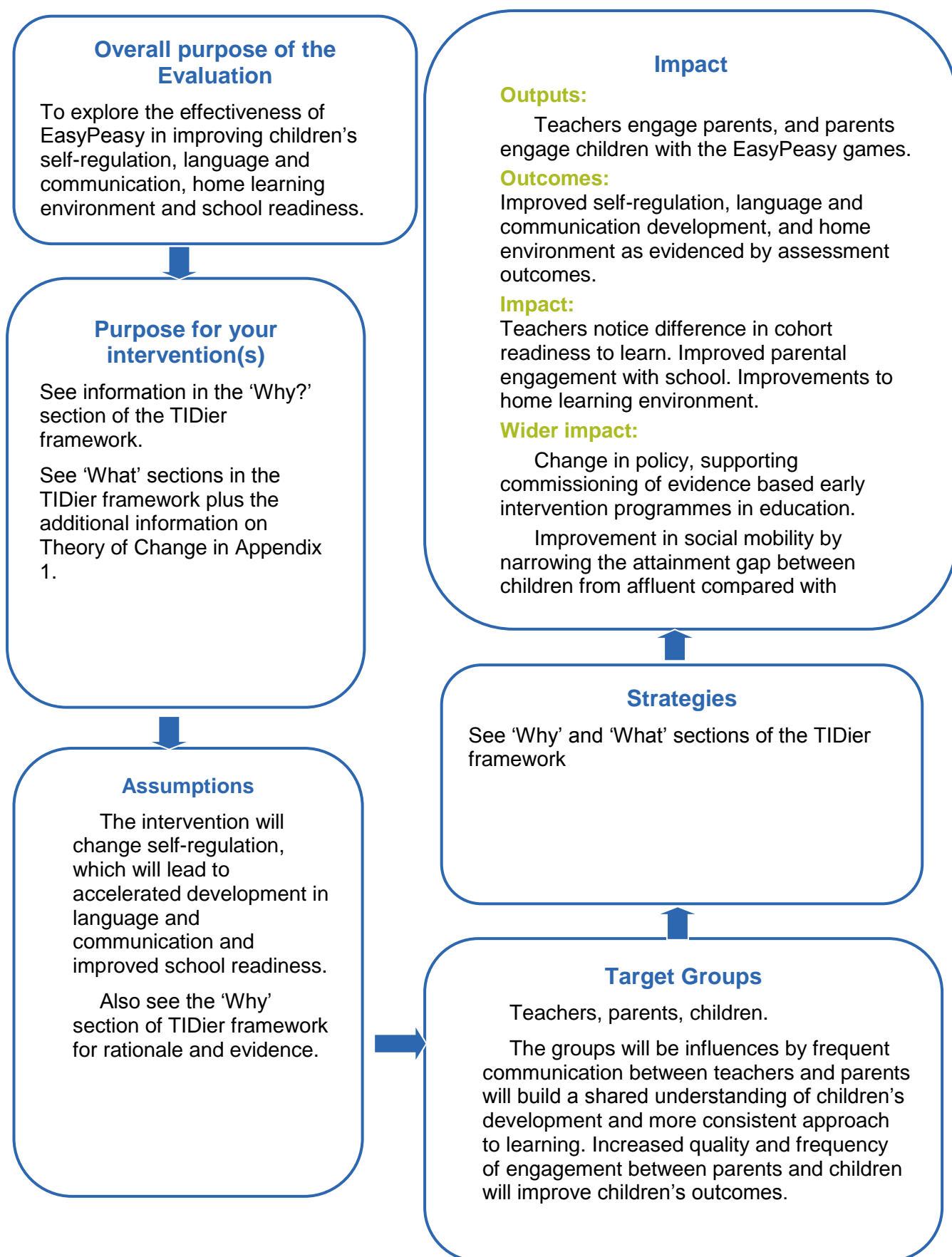
- removed references to EasyPeasy as an app;
- updated the time required for online training from approximately 2 hours previously;
- provided further detail of how parents accessed EasyPeasy through SMS;,,
- added in cascading of Pod Leader training to other practitioners
- changed from Pod Leaders to trained practitioners being responsible for recruiting parents to EasyPeasy
- changed from reception and nursery children being in separate Pods to all children being in the same Pod
- corrected that parental consent was required for the project and not for EasyPeasy

The intervention delivery date was also changed from January 2018 to January 2018/February 2018 to reflect the delay to the intervention start for some schools due to delays in pre-test completion.

2 RESEARCH QUESTIONS

1. What is the impact of the EasyPeasy intervention on the language and communication development of children aged 3-4 years old? [Primary Outcome]
2. What is the impact of the EasyPeasy intervention on the self-regulation of children aged 3-4 years old? [Secondary Outcome 1]
3. What is the impact of the EasyPeasy intervention on the social-emotional development of children aged 3-4 years old? [Secondary Outcome 2]
4. How effective is the EasyPeasy intervention at improving the home learning environment of children aged 3-4 years old? [Secondary Outcome 3]

Figure 1: EasyPeasy Theory of Change



3 DESIGN

We proposed a pragmatic two armed cluster randomised controlled trial. Schools were allocated into one of two groups on a 1:1 ratio to:

- Intervention – schools allocated to receive the EasyPeasy intervention (a five-month intervention); or
- Control – schools allocated to continue with usual early years.

4 RANDOMISATION

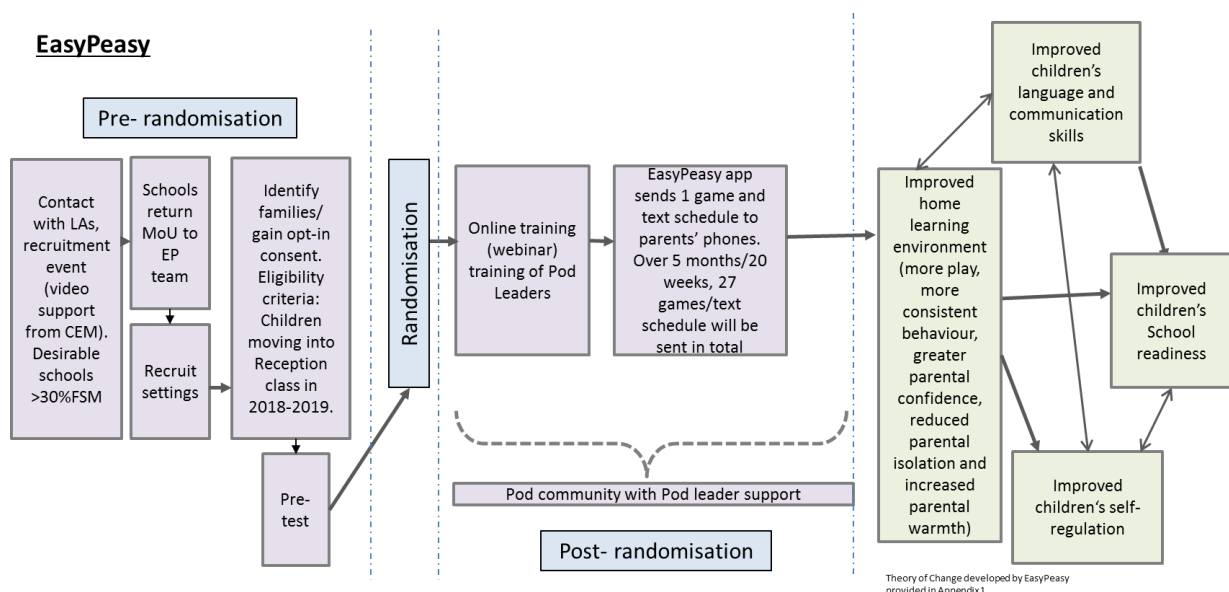
Randomisation was undertaken by the independent trial statistician, Caroline Fairhurst, who had no involvement in the recruitment of schools. Minimisation was undertaken to ensure schools across the two groups were balanced on eligible cohort size as measured by the total number of children consented per school as this data was available from all schools. This was to avoid an imbalance between the control and intervention groups of different proportions of eligible children. This data was collected from schools by the evaluation team. This process, including cut-off for each group, will be detailed in the Statistical Analysis Plan (SAP) and was undertaken by an independent study statistician to ensure that the allocation was concealed.

In a change to the previously published protocol, randomisation was conducted in two batches due to delays in collecting pre-test data from schools. The first batch of randomisation took place on the 19th December 2017 and included 45 schools that had completed (or mostly completed) the CELF pre-test. Where some CELF assessment still needed to be completed, these schools were not informed of their randomisation until it was completed (8/45 schools). The second batch of randomisation took place on the 23rd January 2018 and included the remaining 57 schools that had completed (or mostly completed) the CELF assessment. One school still had some CELF assessments to be completed and they were informed of their allocation the following day after completion of the assessment.

5 PARTICIPANTS

The flow of participants throughout the trial is summarised by the EasyPeasy Logic Model, detailed in Figure 2.

Figure 2: EasyPeasy Logic Model



5.1 SCHOOLS

The original protocol stated that a sample of 108 schools with nursery classes was required and that initial recruitment would target 120 schools to account for attrition with. 60 schools randomly allocated to each arm to ensure that the trial is sufficiently powered with a low level of setting-level attrition. However, although initial interest from schools in taking part was high (132 schools returned MoUs), due to challenges with completing the pre-assessments and schools returning information to the evaluation team as well as some schools not being able to recruit enough parents to the trial, the desired sample size of 108 was not reached.. While recruitment and pre-testing were ongoing, discussions took place between EasyPeasy, EEF and the evaluation team about the sample size that was required for the trial to go ahead. Sample size calculations were reworked by the evaluation team and by EEF (detailed in the Sample Size section) and it was agreed that 102 schools and 10 families per school (originally 13) would be adequate for the trial to go ahead.

Participating schools were only eligible to take part in the study if they agreed to all of the study requirements outlined in the Memorandum of Understanding (MoU) which described their commitment to the delivery of EasyPeasy and participation in the recruitment of a minimum number of families to the trial and administration of the measures (Appendix 2). Whilst schools were required to gain a minimum number of consent forms from parents/guardians whose children fit the eligibility criteria (detailed in the next section), EasyPeasy is a setting level intervention and parents/guardians from of both nursery and reception-aged children were invited to join.

Eligible settings were state funded schools whose child population includes children who are three years old. The recruitment of schools with an average ever-Free School Meal (FSM) percentage of >30 overall was desirable to ensure we were targeting those with the highest levels of deprivation. Schools with <30% FSMEVER and PVI nurseries were considered as a back-up where recruitment of schools with preferred characteristics was problematic. Eligible schools should not have previously been involved in the EasyPeasy intervention.

The school recruitment process for the trial was led by EasyPeasy and supported by the evaluation team at Durham. Setting recruitment took place in two phases. The first phase will involved liaison with and the recruitment of LAs by the EasyPeasy team. It was originally planned to recruit four LAs however due to receiving interest from many more, 9 LAs were recruited to the trial (this information has been added in this update to the protocol). LAs provide a contribution towards the cost of purchasing EasyPeasy for each school that signs up to the trial with the remaining cost being covered by EEF. The EasyPeasy programme is of no cost to participating schools except for schools in Doncaster LA who were asked to contribute £250 to the LA directly during recruitment. The second phase of recruitment consisted of outreach activities led jointly by EasyPeasy and LA partners. 341 eligible schools received information about the trial through a mail out and were advised that their participation in the trial would be determined on a 'first come first served basis' and that a limited number of places were available. Schools were to return signed MoUs to EasyPeasy in the first instance, who will share these with the evaluation team. The original protocol stated that if response rates appeared low within an LA, EasyPeasy would organise a recruitment event for schools to attend however this update can confirm that no recruitment events took place due to acceptable numbers of recruitment. Details of recruitment events have been removed from this protocol update. It was up to individual schools to indicate their

willingness to participate in the trial via submission of the MoU to the research partners (EasyPeasy and the Evaluation team).

Each school was responsible for nominating a staff member to manage their participation and contribution to the trial. This staff member would also take on the role of 'Pod Leader' if the school was randomly allocated to receive the intervention.

Schools do not receive a financial incentive for participating in components of the evaluation; regardless of their allocation all schools will -at some point- receive the EasyPeasy programme as incentive for participating in the trial. Schools which were allocated to the intervention group receive the EasyPeasy programme for use during the academic year of 2017-18. Schools randomly allocated to the control group will receive the EasyPeasy programme for use during the academic year of 2018-19. This wait-list method will ensure the 2017-18 control cohort do not receive the intervention at any point but that all schools do get use of the programme. LA's were informed of the allocation (intervention/control) of the schools in their area.

5.2 PARENTS/CARERS AND CHILDREN

Parents of children who were three years old at the start of the intervention and due to start reception class in September 2018-19 were eligible to participate in the trial. EasyPeasy pilot data reported that access to smart phones, via which EasyPeasy is accessed, was not a barrier even in lower income families (Jelley *et al.*, 2006). Following the purchase of EasyPeasy it is usual practice that EasyPeasy would be offered to all parents via initial invitation text initiated by the setting. At this point parents/carers can opt-out of receiving the programme by informing their Pod Leader. Within the context of this research trial it was necessary for parents/carers of 3+ year olds to provide written opt-in consent for their participation in the research on the assumption that their child's early years setting may or may not be randomly allocated to receive the programme during their child's duration at nursery. Parents/guardians of eligible children were informed of the trial via an information letter developed collaboratively by the research partners, and passed on to them by the school. Here, parents/guardians were required to give opt-in consent for their child to participate in the pre- and post-intervention testing. At this stage parents/carers were also requested to provide consent:

- a) For their child to participate in pre-and post-intervention data collection
- b) For their child's data to be shared between the research teams
- c) For their child's data to be archived within the EEF database
- d) For the evaluation team to contact them by telephone, email and/or post to collect school destination data for their child, should their child's early years provider not know this. This is data so that children's educational attainment can be tracked, long-term, using the National Pupil Database (NPD).

In some instances children are not assigned a Unique Pupil Number (UPN) until they reach reception class; however the child's name, date of birth and school destination is sufficient for linkage to NPD. It is anticipated that children's UPN or school destination data for each child will be collected from the schools directly, however, in event that these data are unavailable; the evaluation team will contact parents directly.

Parents/carers were given the option to opt-in to EasyPeasy even if they had opted out of participating in the evaluation.

6 OUTCOME MEASURES

Table 2 provides a summary of the Primary and Secondary outcomes and data collection methods.

Table 2: Description of Outcome Measures and Collection Methods

	Outcome	Data collection method	Variable
P r i m a r y	Change in children's language and communication between pre- and post- data.	Clinical Evaluation of Language Fundamentals Preschool 2 UK (CELF- Preschool 2 UK) developed by Wiig, Secord and Semel ¹ . This will be administered to all children in the study sample by trained assessors. Administration time of relevant scales: 20-25 minutes per child.	Core Language Score, comprising: Sentence structure, expressive vocab, word structure subtest. Plus concepts and following directions subtest
S e c o n d a r y	Changes in children's self-regulation and social-emotional development between pre- and post- data.	Child Social Behaviour Questionnaire (CSBQ) developed by Howard and Melhuish (see Howard and Melhuish 2016). The questionnaire can be completed on paper by a class teacher/practitioner for all consented children. Completion time: ≤5 minutes.	Assessment strands reported as subscales include: Sociability, Externalising, Internalising, Prosocial, Behavioural Self-regulation, Cognitive Self-Regulation, Emotional Self-regulation
	Changes in home environment between pre- and post- data.	Home Observation and Measurement of Environment (HOME) developed by Bettye M. Caldwell and Robert H. Bradley (see Caldwell and Bradley 1984). The inventory administered to a sub-sample of 50 households split evenly between control and intervention groups. Administration time: 45-60 minutes.	Assessment strands include: Learning materials, Language stimulation, Responsivity, Academic stimulation, Boundaries, Variety of indoor/outdoor activities

6.1 PRIMARY OUTCOME

The primary outcome measure is child language development at the end of nursery measured using the Clinical Evaluation of Language Fundamentals Preschool 2 UK (CELF-

¹ See: <http://www.pearsonclinical.co.uk/Psychology/ChildCognitionNeuropsychologyandLanguage/ChildLanguage/CELF-Preschool2UK/CELF-Preschool2UK.aspx>

Preschool 2 UK) which will provide a measure for expressive and receptive language skills in young children. The assessment is multiple choice and requires the child to simply point to the picture that is described by the test administrator, e.g. “point to the cat after I have pointed to the monkey”; there are multiple pictures for the child to choose from, the correct picture (cat) and other distractor pictures. Each subtest of the measure includes various question items (ranging from 20-22) and discontinuation rules. For the purposes of this trial, the following norm-referenced subtests of the measure will be implemented:

- Sentence Structure (22 Items. Discontinue rule: 5 consecutive zero scores)
- Word Structure (24 Items. Discontinue rule: 8 consecutive zero scores)
- Expressive Vocabulary (20 items. Discontinue rule: 7 consecutive zero scores)
- Concepts and Following Directions (22 Items. Discontinue rule: 6 consecutive zero scores)

For each subtest, a raw score and scaled score will be calculated. In addition, a Core Language Standard Score will be derived from Sentence Structure, Word Structure and Expressive Vocabulary. Table 3 provides a breakdown of the measure’s subtests inter-correlations (devised from US data, $n=800$) with Cronbach’s alphas for the four subtests ranging from 0.78 – 0.84 across the ages three years and zero months to four years and 11 months.

The Core Language Standard Score will be used as the outcome in the primary analyses while the data from the individual subtests will be reported as secondary outcomes (this is an update from the original protocol).

Table 3: CELF Preschool-2 Inter-correlations

	Sentence Structure	Word Structure	Expressive Vocabulary	Concepts & Following Directions
Sentence Structure				
Word Structure	0.53			
Expressive Vocabulary	0.58	0.62		
Concepts & Following Directions	0.61	0.58	0.61	
Core Language Score	0.83	0.84	0.86	0.71

The four subtests from the CELF-Preschool 2 UK will be administered to all children ($n=1199$ – number updated from original protocol based on actual numbers) in the trial.

Independent test administrators (including researchers, teachers, teaching assistants, and independent early years staff) will conduct the assessment pre- (before randomisation) and post-intervention. Each test administrator is required to attend mandatory training led by the evaluation team. Test administrators will be blinded to the school's random allocation for post-intervention testing.

Limitations of testing in the early years are the young age and temperament of children who may or may not be responsive at the time of testing, potentially leading to missing data. To minimise this issue, the child can be accompanied by a familiar adult during the assessment if necessary.

The evaluation team liaise with school staff and the test administrators to arrange a suitable date for them to visit to assess the children. Two visits are scheduled for days when the most children are present at the school, given the variety of attendance patterns among pre-school children. There may be a small number of children for whom we have relevant consent but who are not present at the school (e.g. due to absence, sickness, holidays) on the day(s) the test administrator visits. Up to 10% of schools will be revisited for a third time to gather missing pre- and post-intervention data should some children be absent on the first collection dates.

Update from original protocol on assessors and training:

For pre-testing, test administrators were mainly recruited from the areas where schools were based through supply agencies, and training was held in venues across the country. Due to difficulties with availability and reliability of test administrators recruited through the agency route, post-testing will not use agency staff but the evaluation team will instead recruit test administrators directly from eligible people based mostly in Durham. Training for Post-test administrators will take place in Durham. The training takes place over a half day and includes; what the CELF assessment is, how to administer the CELF assessment tool, practice using the tool, background to the project, reporting processes, data protection, safe guarding, process for audio recording the administration of the CELF assessment for quality assurance purposes and who to contact with any questions or issues during delivery of the assessments.

Update from original protocol on Quality Assurance (QA) of assessments

Test administrators will audio record the delivery of the assessments for QA purposes as long as parents give consent for this (opt-out). The evaluation team will listen to the audio recordings of ten percent of the assessments to make a judgement of quality of delivery, making sure that assessments conducted by every assessor are quality assured. If a test administrator assists with pre-intervention data collection and were deemed satisfactory following QA, they will not need to undergo QA at post-intervention data collection. This QA process is different to that described in the original protocol where test administrators would have been observed by members of the evaluation team while delivering the assessment. Audio recorded was deemed more thorough given that all assessments (where consent is given) can be recorded and the test delivery would not be affected by an observer.

6.2 SECONDARY OUTCOMES

Self-regulation and behaviour scores gathered using the Child Self-regulation and Behaviour Questionnaire (CSBQ) (Howard & Melhuish, 2016). The CSBQ is a 33 item questionnaire pertaining to children's everyday behaviours related to children's social and emotional development and self-regulation (e.g., persists with difficult tasks and waits their turn in activities). CSBQ measures:

- Self-Regulation (Cognitive, Emotional and Behavioural)
- Sociability
- Prosocial Behaviour
- Externalising Problems
- Internalising Problems

For each item, the test administrator is asked to evaluate the child's frequency of target behaviours on a 5-point scale (not true – certainly true). All subscales contain at least 5 items. Cronbach's alphas for each subscale are as follows: Sociability = .74, Internalizing = .78, Emotional Self-Regulation = .83, Cognitive Self-Regulation = .87, Externalizing = .88, Prosocial = .89, and Behavioural Self-Regulation = .89. The assessment will be completed by the children's class teachers for all children with relevant consent pre- (prior to randomisation) and post-intervention.

The Home Observation Measure of the Environment (HOME) is intended for use by practitioners and researchers and is a descriptive profile which yields a systematic assessment of a child's home environment to measure, within a naturalistic context, the quality and quantity of stimulation and support available to the child through measuring the active receipt of inputs from objects, events and transactions occurring within the home environment (Bradley 1993). The 'Early Childhood HOME' is suitable for use among 3-6 year olds and involves a visit by a researcher to the home, and includes an interview with the main caregiver whilst the child is present and awake. It is made up of 55 items that are grouped in eight different subscales that are scored in a binary manner (YES/NO). Six of the eight subscales are relevant to the learning aims of EasyPeasy and the EYFS and so will be used here. These are:

1. Learning materials
2. Language stimulation (between child and caregiver)
3. Responsivity (verbal interaction between child and caregiver)
4. Academic stimulation
5. Modelling
6. Variety of activities and parental interaction

Totsika & Sylva (2004) note the strongest advantage of HOME is the correlation it has to measures of cognitive development, and HOME has been found to detect significant differences within disadvantaged home environments (Keltner 1994).

The HOME inventory will be used in a sub-sample of $n=50$ households in both intervention ($n=25$) and control groups ($n=25$), pre- and post-intervention. Pre-intervention HOME visits for both the intervention and control groups will be conducted in the immediate weeks

following randomisation, prior to parents starting the intervention. Parents who have already provided consent for their child to participate in attainment measures as part of the evaluation will be invited to take part in the HOME visits. These visits will be conducted by trained researchers. (updated from research associate and research assistant in original protocol due to needing more researchers within a short period of time to conduct these visits). As incentive to parents to participate in the HOME visits, they will be provided with a £50 Love2Shop gift voucher after the final visit.

The use of the HOME inventory will allow us to measure the impact to learning that we anticipate EasyPeasy could have within home environments of those who receive the intervention. This measure will allow us to investigate how and why the intervention leads to improvements to the home learning environment, which can be determined through analyses of the different HOME subscales i.e. is it through changes to environment, better quality learning resources and/or more child parent interaction?

Other relevant data will be collected as part of the evaluation so that matching reference numbers can be provided for participating children to enable the long-term tracking of the EasyPeasy intervention through the National Pupil Database and where available, the Early Years Foundation Stage Profile (EYFSP).

7 SAMPLE SIZE CALCULATIONS

The sample size calculations included here have been updated from the original protocol. Due to issues with recruitment (some schools being unable to recruit enough parents, or return required paperwork) and pre-testing causing some schools to withdraw there was some concern about not reaching the number of schools specified in the original protocol. Discussions were therefore held during the recruitment and pre-test period, between EEF, the EasyPeasy team and the evaluation team about the sample size calculations assumptions and expected effect size as well as what would be an acceptable number of schools. The sample size calculations now included were completed by EEF and agreed by the other teams (see Table 4 below). We made the following assumptions for sample size estimate: an intra cluster correlation of 0.11 and 10 children per school whose parents have provided consent. We assumed the proportion of variance explained by covariates at the individual level (Level 1 – pupil level) to be 0.25 and at the cluster level to be 0.16 (Level 2 – setting level). Based on 102 schools (the number still in the trial at the time of discussions) (approx. 1010 children; 505 children per arm), we would have 80% power to show a difference of 0.221 of an effect size between the control and intervention groups. At the piloting stage (conducted by Oxford University and funded by The Sutton Trust), the positive effect sizes of parents' self-efficacy regarding discipline and boundaries and child cognitive self-regulation were 0.51 and 0.44, respectively. We expect the effect size to be reduced for this study in line with Slavin and Smith (2009) who find that scaling to a larger sample is associated with two or three times smaller observed effect sizes.

In the original protocol we aimed to recruit 120 schools and 13 children per school to allow us to deal with a moderate amount of setting level attrition. However, as fewer schools were randomised ($n = 102$), we will continue to try to minimise attrition from the project in order to maintain all 102 schools at post-test.

Table 4. Power and sample size calculations (using the PowerUp tool)

Model 3.1: MDES Calculator for Two-Level Cluster Random Assignment Design (CRA2_2)— Treatment at Level 2		
Assumptions		Comments
Alpha Level (α)	0.05	Probability of a Type I error
Two-tailed or One-tailed Test?	2	
Power ($1-\beta$)	0.80	Statistical power (1-probability of a Type II error)
Rho (ICC)	0.11	Proportion of variance in outcome that is between clusters
P	0.50	Proportion of Level 2 units randomized to treatment: $J_T / (J_T + J_C)$
R_1^2	0.25	Proportion of variance in Level 1 outcomes explained by Level 1 covariates
R_2^2	0.16	Proportion of variance in Level 2 outcome explained by Level 2 covariates
g^*	4	Number of Level 2 covariates
n (Average Cluster Size)	10	Mean number of Level 1 units per Level 2 cluster (harmonic mean recommended)
J (Sample Size [# of Clusters])	102	Number of Level 2 units
M (Multiplier)	2.83	Computed from T_1 and T_2
T_1 (Precision)	1.98	Determined from alpha level, given two-tailed or one-tailed test
T_2 (Power)	0.85	Determined from given power level
MDES	0.221	Minimum Detectable Effect Size

8 ANALYSIS PLAN

A detailed SAP will be produced and submitted to EEF 3 months after the final randomisation date.

Analyses will be conducted on an intention-to-treat basis, using two-sided significance at the 5% level. Baseline data will be summarised by treatment group and presented descriptively. CACE analyses will be conducted. Effect sizes based on the difference between the groups at the post-test will be presented as Hedges' g with 95% confidence intervals. The intra-cluster correlation coefficient (ICC) at the post-test will be presented.

Subgroup analyses will consider children that are eligible for the Early Years Pupil Premium, where English is an Additional Language (EAL) and gender.

All analyses will be detailed in the SAP.

9 IMPLEMENTATION AND PROCESS EVALUATION METHODS

9.1 RESEARCH QUESTIONS

1. How is the intervention being disseminated to parents through schools and is the method effective?
2. Can all parents access and engage with the EasyPeasy intervention? e.g. from all socio-economic backgrounds, in EAL families, in families with SEND children.
3. To what extent are the schools and parents engaging with and delivering the intervention?
4. Is fidelity to the intervention being maintained?
 - a. Are nominated staff engaging with EasyPeasy and using it as mechanism to foster communication and engagement between parents.
 - b. Are parents engaging with EasyPeasy and implementing the suggested activities within the home?
5. What are the different stakeholder viewpoints on the intervention?
 - a. Setting practitioners
 - b. Parents
6. How effective and appropriately pitched are the activities:
 - a. For parents to deliver
 - b. For children to receive
7. What are the key success factors required for the EasyPeasy intervention to work well?
8. What are the barriers to successful delivery of the intervention?
 - a. For parents
 - b. For setting practitioners
9. What areas of the programme could be further developed following completion of the project?
10. What is the acceptability of the intervention to parents and does this differ depending on the socio-economic status of the parents (based on their child's eligibility for Early Years Pupil Premium), their child's Special Education Needs Diagnosis or English as an Additional Language status? (This question was updated in v2 of the protocol with the removal of parental qualification and the addition of Special Educational Needs and English as an additional language status)

DESIGN SUMMARY

The process evaluation will take place over the full five-month duration of programme delivery and will monitor implementation fidelity, the processes involved for schools in implementing the intervention, and the perceptions of relevant stakeholders. Process evaluation activity will be mapped to Humphrey's (2016a, 2016b) eight dimensions, ensuring appropriate coverage of each dimension. A practitioner survey collected post-intervention will also allow the collection of quantitative implementation fidelity data. It has been necessary to remove the use of data automatically collected through schools weekly reports for monitoring fidelity in this protocol update due to consent issues for the EasyPeasy team sharing the data.

To investigate the processes involved in implementing the intervention we will also conduct a multiple case study design with both longitudinal and cross-sectional aspects. For two schools we will closely follow the processes involved in implementing the EasyPeasy intervention and how changes in practice occur over the course of the intervention through visits at two time-points during the year. Four additional schools will be involved in the cross-sectional aspects with one visit to each setting to elicit observation data and perceptions of stakeholders at set times allowing comparisons to be made between schools at specific time

points (two randomly selected schools at a mid-point in the intervention and two ‘best practice’ schools selected by EasyPeasy towards the end of the intervention).

All schools will be requested to complete a ‘usual practice’ survey pre-randomisation and post-intervention to build up a picture of current provision of parental engagement and school readiness activities, including any associated financial costs

9.2 MONITORING PROGRAMME FIDELITY AND COMPLIANCE

This section has been updated from the original protocol following discussions between EEF, the EasyPeasy team and the evaluation team about monitoring fidelity regarding data that could be provided and used.

The EasyPeasy programme is delivered across multiple levels:

- The EasyPeasy team deliver the intervention via website application (web-app), training and text message to parents
- The Pod Leader at the school attends training and signs parents up to the programme, monitors and supports parent engagement throughout the programme through Pod management (using their web-based platform) and also potentially uses the EasyPeasy games with the nursery children in their setting
- The parents of children in the school receive the text messages and then access the games and information provided on the web-app, play the games with their child and interact with the Pod community (of other parents and the nursery staff on the web-app and face-to-face in the setting)
- The child plays the EasyPeasy games with their parent

Ideally, we would like to measure compliance across these four levels.

At the top level of the technical delivery, EasyPeasy will provide a report at the end of the intervention period detailing any technical failures with the web-app or the sending of text messages to parents throughout the programme. This information will allow us to report on whether there were any technical problems or issues that may have affected the delivery of the programme as intended.

At the Pod Leader level, EasyPeasy will provide the evaluation team with details of which Pod Leaders attended the training. If there is variation in this at a school level we will use this figure in a compliance analysis to investigate whether the impact of EasyPeasy varies depending on whether Pod Leader attended training. We will also collect data through the Pod Leader survey on the amount of time Pod Leaders spent supporting delivery of EasyPeasy.

At the parent level, EasyPeasy will provide information on the level of parental drop-out (number of parents who ask to be removed from the EasyPeasy programme) across the project which will be reported to give an insight into how many parents do not engage at all with the programme. Jelley *et al.* (2016) reported that 3% of parents chose to opt-out of receiving the intervention during the EasyPeasy pilot study.

It will not be possible to measure whether parents are actually playing the games with their children however, this will be explored during the parental focus groups which will take place as part of the case studies in six settings but will not be reported as part of compliance with the programme.

10 SCHOOL CASE STUDIES

Ten percent of schools ($n=6$) in the intervention group will be randomly selected to participate in case studies. These will involve:

Longitudinal case studies: Two schools will be requested to participate in a telephone interview at the beginning of the intervention and an in-school face-to-face interview with a member of the research team in the last few weeks of intervention delivery.

Cross-sectional case studies: Two schools will be requested to participate in an in-school face-to-face interview with a member of the research team mid-way through the programme.

These four schools will be chosen at random at the beginning of the trial, and will be replaced (at random) if drop-out occurs.

‘Best Practice’ case studies: Towards the end of the project, a further two schools where the intervention is perceived as being successful both in delivery and impact, will be selected to participate in these ‘best practice’ case study visits. These ‘best practice’ schools will be chosen from schools with a higher than average pod engagement determined through the average number of weekly playdates and positive reports of impact from Pod Leaders to EasyPeasy.

During the case studies, the evaluation team will request to interview the Pod Leader. The Pod Leader interviews will provide an understanding of how schools deliver and monitor the intervention, any barriers, strategies for keeping parents engaged and to gauge potential impact, if any, of an improved home learning environment via EasyPeasy on children’s learning within the nursery. Understanding the Pod Leaders use of the weekly report will also be covered during these interviews. Weekly Pod report data includes:

- The number of parents who have visited the Pod at least once within the week.
- The three parents who are the most active within the Pod are named.
- The three parents who visited the least within the Pod are named.
- The comments made by parents within the Pod that week.

The interview provides an opportunity to gauge how, if at all, Pod Leader encourage the parents who are named as being inactive to re-engage, and acknowledge, if at all, parents who are named as being very active; improve Pod engagement, if applicable.

During visits to case study schools, the evaluation team will also conduct a focus group with parents who engaged (at any level) with the EasyPeasy intervention (discussed further below). The parent focus groups will take place at both the cross-sectional and end-point schools visits, and at the final visit of the in-depth case study schools.

The parental focus groups will include 5-8 parents who signed up to the EasyPeasy intervention. The focus groups will explore the acceptability and delivery of EasyPeasy and how it was used and adapted in individual circumstances, including any barriers that may have been faced. The focus groups will also explore if the programme has had an impact on parents' understanding of child development and parents' attitudes and engagement with their child and their child's learning. The focus group will also seek to gauge any changes to the level of parent-school interactions as a result of implementing the EasyPeasy programme. Focus groups will last approximately 30-40 minutes (and no more than an hour), and will take place in the setting at a time to be determined, most convenient to the parents and the school. Consent will be gained for participation. Each parent will receive a £15 Love2Shop voucher for taking part.

Table 5: Summary of school case study visits

Type of case study	Intervention period		
	Beginning	Mid-way	End
Longitudinal (n=2)	Telephone interview	-	Face-to-face interview with Pod Leader; Focus group with parents
Cross-sectional (n=2)	-	Face-to-face interview with Pod Leader; Focus group with parents	-
Best practice (n=2)	-	-	Face-to-face interview with Pod Leader; Focus group with parents

10.1 FEEDBACK SURVEY OF TEACHING STAFF

All Pod Leaders will be requested to complete an online survey developed by the evaluation team at the end of the intervention to capture resource usefulness and acceptability, intervention delivery and perceived impact of EasyPeasy. This, in addition to the interviews and focus groups, will provide information in relation to relevant research questions, covering the dimensions of, and factors affecting implementation, as outlined in the EEF guidance¹. Details on the costs to schools (e.g. monetary, staff time) associated with implementing EasyPeasy will also be captured here.

INTERVIEW WITH DEVELOPERS

¹https://educationendowmentfoundation.org.uk/public/files/Evaluation/Setting_up_an_Evaluation/IPE_Guidance_Final.pdf

An interview with the developers will be conducted at the end of the programme to discuss further development of/changes to the programme, perceived impact, implementation fidelity including actual barriers, future plans, including information on costs to be included in the cost evaluation in line with recent guidance from the EEF.

COST EVALUATION

Data on intervention costs will be collected from EasyPeasy as well as from schools participating in the case studies, through interviews as part of the process evaluation, and will be used to conduct a cost evaluation in line with recent guidance from the EEF.

11 ETHICS AND REGISTRATION

Ethical approval for the evaluation has been received from Durham University's School of Education Ethics Committee on 31/08/2017 and from University of York Health Sciences Committee on 01/09/2017.

Opt-in consent was sought from each school to take part in the overall trial. Their continued participation in the intervention is dependent upon their consent to participate in the evaluation and subsequent data sharing with the EEF. Opt-in consent has also been sought from relevant school staff for observations, interviews and surveys as part of the process evaluation. Opt-in consent has been sought from relevant parents for child assessments, home visits, focus group interviews and surveys as part of the process evaluation.

The Evaluation Team has registered the trial with ISRCTN (www.controlled-trials.com) following agreement of the original protocol. (Registration number: ISRCTN22325174).

12 PERSONNEL

This independent evaluation is being led by a team of researchers from Durham University in collaboration with the York Trials Unit at the University of York and includes:

Dr Lyn Robinson, an experienced Research Associate at Durham University with experience of leading and delivering large trials, including those funded by the EEF (Literacy Octopus, Maths Champions Evaluation, Teen Sleep). Her expertise and interest lies in conducting research in early years settings to improve attainment for disadvantaged children, and developing and delivering continuing professional development (CPD) training (Literacy Octopus) for learning and assessment (Maths Champions). Her strengths include developing creative methods of recruitment, retention and data collection within trials, particularly when working within the early years in disadvantaged settings (Robinson & Ball 2013, Robinson 2016). She will be Principal Investigator of this evaluation. She will oversee the development of the impact, process and cost evaluation elements, contributing expertise to the design and conduct of this evaluation as well as lead on the writing of progress/final report. She will undertake all trial management leadership responsibilities. Lyn is on maternity leave from 7th October 2017 returning to the office in November 2018. During this time, Principle Investigator has been transferred to Prof Christine Merrell between September 2017 and November 2017 and to Victoria Menzies from November 2017 to November 2018.

Victoria Menzies, an experienced education trial coordinator and researcher at Durham University with experience of running large trials in nurseries (Maths Champions), primary (Shared Maths Project, Hallé SHINE on Manchester, Peer Tutoring in Maths in Scotland) and secondary schools (Project Based Learning, ICCAMS 2 Project, SHINE in Secondaries). As trial coordinator on a number of projects, she is aware of the many challenges involved in doing randomised controlled trials (RCTs) in education and has developed a bank of methods and possible solutions to deal with these. Her research interests lie in randomised controlled trial methodology including piloting and reporting, and in the development of maths and literacy skills; previous research projects have included studies of early number development in Scotland and the effect of phonological awareness and training on children's early reading skills. She has also developed and delivered educational interventions in both primary and secondary schools as part of trials. Victoria will be co-investigator (and acting PI) of this evaluation, contributing expertise to the design and conduct of the evaluation and the process evaluation and will lead on writing all progress reports and the final report.

Professor Christine Merrell has published extensively in the area of young children's development and has many years of experience in developing assessments for use with children in the early years and primary school. Christine's experience and expertise will be valuable in informing the process evaluation and interpreting the findings from both the process evaluation and the outcome measures.

Dr Helen Cramman is an experienced project manager and is Research Team Lead for the Research Hub at the School of Education at Durham University. Helen has over 14 years experience managing projects of varying scale and complexity in industry and academia. Before joining the research team at the Centre for Evaluation and Monitoring, Helen trained primary school teachers, senior leaders and local authority representatives in the effective use of assessment data and has supported and advised multiple EEF evaluations in their use of assessments for pre and post testing. Helen has published in the area of early literacy and numeracy. She will be responsible for overseeing high level management of the trial. Helen will lead the delivery of pre- and post testing, will maintain budgetary control and contribute towards writing progress reports and the final report.

Dr Susan Stothard, a Chartered Psychologist and an Associate Fellow of the British Psychological Society. Sue's combination of practical experience (conducting educational assessments of young children), research expertise (investigating the factors that impact cognitive development), and applied experience (writing educational assessments for nursery and primary school children) will be valuable in informing the pre-test and outcome measures, and interpreting the findings. Sue was involved in setting the project up but left the team in September 2017 and her role in advising on assessment has been taken on by Nadin Beckman for the remainder of the project.

Dr Nadin Beckmann, Associate Professor at the Durham University's School of Education, is a Psychologist with research interests in Educational Psychology and Psychometric Assessment. Nadin will advise on the use of the pre-test and outcome measures including monitoring their delivery and interpreting the findings and deliver training in the administration of the CELF assessments. Nadin takes over this role from Dr Susan Stothard as of September 2017.

Professor Carole Torgerson, an educational trials design and methods expert and an educationalist from Durham University. She has undertaken over 25 systematic reviews of randomised controlled trials and has been lead or co-investigator on around 15 trials evaluating a variety of education and health education interventions. Carole will be a co-

investigator of this evaluation, contributing expertise to the design and conduct, as well as to the writing of the final report.

Caroline Fairhurst (York Trials Unit, University of York)

Caroline Fairhurst is a statistician, currently supporting a number of trials within the York Trials Unit. She will be a co-investigator of this evaluation contributing to the design and conduct of the trial, development of the SAP and undertaking the statistical analysis.

Dr Linda (Yuqian) Wang, a Research Associate at Durham University. Linda has worked with local schools, Education Durham and Further Maths Support Programme (FMSP) for the PANDA project to pioneer in-service teachers' professional development in the North East of England to meet the new curriculum and pedagogy challenges. Linda will liaise with project leadership to deliver the trial on a day-to-day basis, contribute towards the process and cost evaluation and contribute towards writing the SAP, progress reports and final report.

Sarah Hallett, Research Administrator, will coordinate the administration of assessments and liaise with settings for visits and for data collection purposes. She will also coordinate the collection of school destination data from parents.

The EasyPeasy Developer Team and their responsibilities are:

Jen Lexmond, EasyPeasy CEO, will

- take overall responsibility for the high quality delivery of EasyPeasy during the research trial
- secure local authority strategic delivery partnerships
- manage relationships with these partners during the course of the research trial

Nicola Doherty, Research and Account Manager, will

- develop necessary materials and documents to support trial recruitment, data collection, and communications with research participants
- develop a detailed project timeline to assist EasyPeasy and evaluation team
- allocate and clarify roles and responsibilities between evaluation team and EasyPeasy team
- set up project management systems to aid communication, clear decision making, and timely delivery of the project
- ensure key milestones are reached on time, as stated in the EEF grant agreement
- build relationships with and liaise effectively with research partners at Durham University
- deliver recruitment events and other outreach activities to support milestone of recruiting schools
- organise and facilitate webinar training with Pod Leaders
- manage accounts for EasyPeasy Pods: setting up Pods, managing Pods, managing parent on-boarding and providing proactive and responsive contact with Pod Leaders (about engagement and Pod related queries), sending newsletters, providing phone email and intercom support to Pod Leaders

Louise Morpeth, Partnership Development Lead, will

- develop relationships with potential strategic delivery partners

- secure local authority strategic delivery partnerships
- consider future sustainability of these partnerships beyond the research trial period and develop sustainability strategies

Andy Russell, Communications Lead, will

- generate awareness and interest in the research trial opportunity amongst relevant stakeholder groups
- develop consistent and clear messaging regarding the trial and EasyPeasy's current evidence base and operation

Jane Bradbury, Account Manager, will

- deliver recruitment events and other outreach activities to support milestone of recruiting schools
- organise and facilitate webinar training with Pod Leaders
- manage accounts for EasyPeasy Pods: setting up Pods, managing Pods, managing parent on boarding and providing proactive and responsive contact with Pod Leaders (about engagement and Pod related queries), sending newsletters, providing phone email and intercom support to Pod Leaders

Esteban Simon, CTO, will

- take overall responsibility for the technical delivery of EasyPeasy to all participating users in the trial
- ensure protection and safe storage of users' data and information
- ensure timely response to bugs, technical errors, and other problems as set out in EasyPeasy's Service Level Agreement (SLA)

RISKS

Risk	Detail	Mitigation
1 Capacity within Durham to run trial	Proposed timeline brought forward, leading to capacity issues for Durham	EEF issued letter of intent. Durham requested faculty approval to appoint a researcher. Durham and EasyPeasy to quickly produce project protocol so that costs can be finalised and contract issued. EasyPeasy to lead on LA and school recruitment. EasyPeasy to support Durham with locating supply agencies within recruited LAs for the administration of pre-test data.
2 Intervention period may not be long enough to produce a measurable impact on the primary outcome	The project timeline has been brought forward. It was originally proposed that the intervention lasted for a full academic year. Proposed change of timeline means that intervention period is shortened to 5 months.	Retain the original timeline. Within the 5 month period, parents will receive 27 games.
3 Recruitment of LAs and schools	1. Schools might not be interested in participating 2. Recruitment may take longer than anticipated and we miss the start-date for children beginning the intervention, thus reducing the intervention period.	1. Explore barriers to participation and offer sufficient and appropriate incentives to participate. 2. Utilise existing network connections, e.g. Schools North East, the EEF North East Literacy Campaign, and DfE Opportunity Areas. EP to call on relationship with LA to encourage school recruitment if uptake is initially slow. Stagger start dates of EasyPeasy and split post-data collection across June/July and September of the new school year.

<p>4 Recruitment of parents</p>	<p>1. Recruitment of parents to EasyPeasy via a research project is more complicated and time consuming than the standard approach, which has been designed to minimise barriers to entry. This may lead to fewer, and different types of, parents signing up to the EasyPeasy research study.</p>	<p>1. Acknowledge these possible effects in the Interpretation of Findings. Participation rates in each school will be recorded to give an indication of uptake and identify potential threat to the validity of the evaluation findings. If insufficient parents agree to participate in any school, another school will be required therefore we aim to over-recruit.</p> <p>Parents have the option to use EasyPeasy without being part of the evaluation.</p> <p>Parents are made aware on information and consent forms that they can withdraw their child from the evaluation at any time, without a reason.</p> <p>Parents assured of their own and their child's anonymity and confidentiality of data via parental information sheets and consent forms.</p>
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5 Pre-test data collection	<p>1. Schools are located around England and many more trained assessors are required than originally anticipated.</p> <p>2. Schools are not responsive to dates supplied for trained assessors to go visit.</p> <p>3. The timeline is tight between recruitment, pre-testing and randomisation. Timeline very tight to conduct HOME visits post randomisation but before intervention</p> <p>4. Delay in recruitment and pre-testing will impact on training and delivery of the intervention.</p> <p>5. Selected children are absent on the day of the assessment</p> <p>6. Assessments are lost before received at Durham or loss of data from databases at Durham</p> <p>7. Parents are not at home for the HOME visit.</p>	<p>1. EasyPeasy to focus recruitment activity on clusters of schools</p> <p>2. Research team to speak to Headteacher and encourage response. EP team to utilise strong links with the school's LA to encourage responsiveness.</p> <p>3. EP and Durham teams to update progress and concerns regularly through frequent teleconferences. Recruitment of temporary research assistant(s) to complete these visits.</p> <p>4. Training delivered via webinar which offers more convenience to school and to speed up training process.</p> <p>5. Conduct 'mop up' visits among 10% of schools. Durham team to monitor and discuss with funding options with EEF should further mop-up be required.</p> <p>6. Data management plan agreed which includes back-up arrangements</p> <p>7. Contact parent day before visit to re-confirm visit. Reschedule where possible.</p>
6 Random assignment process	<p>1. Staff unavailable to carry out random assignment on the prescribed day(s).</p> <p>2. Tight timeline.</p>	<p>1. Ensure backup staff are available to do this</p> <p>2. Randomisation could be completed in batches (of schools who have completed pre-test), if necessary, to adhere as close to timeline as possible.</p>

<p>7 Training of intervention schools</p>	<p>1. Low uptake of webinar training which could lead to reduced uptake of intervention/ increased attrition.</p> <p>2. It is possible that school firewall systems will block Pod Leaders accessing the EasyPeasy Webinar training session.</p>	<p>1. Set dates and make schools aware from recruitment the dates of training. Offer multiple webinar sessions for schools to select a suitable date. Offer webinar recording for Pod Leaders to watch at a more convenient time.</p> <p>2. EasyPeasy team to make early contact with school IT leads to ensure Webinar software and EasyPeasy's online dashboard are exempted from the school's firewall.</p>
<p>8 Delivery of the intervention</p>	<p>The additional burden of delivering EasyPeasy as part of an evaluation may negatively affect the quantity and quality of Pod Leader's and parent's engagement</p> <p>1. Complex information and long consent forms could be off-putting for EAL/or low confidence/busy parents - many of those in EasyPeasy's target group.</p> <p>2. Time spent on research tasks may reduce time spent by Pod Leaders on standard engagement tasks encouraged by EP i.e. making and responding to Pod comments, talking to parents about EP, incorporating games into curriculum delivery, and liaising with EP team about queries and feedback.</p>	<p>Acknowledge these possible effects in the Interpretation of Findings.</p> <p>1. Advise school staff to help with interpretation of information and consent forms to ensure fair access to the evaluation. Parent information and consent forms have contact details of the Durham research team for parents to ring and discuss any questions they have about the research.</p> <p>2. Provide high quality account management for Pod Leaders. Ensure that Pod Leaders are aware they can sign up multiple additional staff to receive EasyPeasy weekly reports, to mitigate against staff change or Pod Leaders on sick leave.</p> <p>3. Burden to schools from participating in the evaluation components of research kept 'low' due to pre- and post-testing being</p>

	<p>3. Conversation between parents and pod leaders may become focused on research activities and logistics rather than play and EasyPeasy games</p> <p>4. Pod Leaders might leave the school. This might lead to the disruption of communication channels and might cause parents to disengage.</p>	<p>conducted by independent test administrators and not school staff.</p> <p>4. Pod leaders will be requested to provide the name of another staff member who will continue their role in case of absence/leaving school. If this situation arises, the new Pod Leader will be trained via a webinar recording.</p>
9 Retention of schools	<p>1. The additional requirements of participating in EasyPeasy as part of a complex research study may lead to school withdrawal, where otherwise those schools would have continued delivering EasyPeasy.</p> <p>2. Schools withdraw from the project at any time.</p>	<p>1. Acknowledge this possible effect in the Interpretation of Findings. Initially aim to over-recruit.</p> <p>2. Maintain regular contact with the schools to identify any barriers to participation as they emerge and monitor patterns. Communicate directly with schools to offer help to overcome the reasons.</p>
10 Retention of participants	<p>The additional requirements of participating in EasyPeasy as part of a complex research study may lead to parent withdrawal, where otherwise those parents would have continued engaging with EasyPeasy.</p>	<p>Acknowledge this possible effect in the Interpretation of Findings</p> <p>Keep parental research requirements to a minimum. The number of parents required for focus group participation is minimal. Participation in focus groups is optional and incentives are provided.</p> <p>Support Pod Leaders to engage with, establish relationships and motivate parents.</p> <p>Make full use of analytics data, and EasyPeasy's customer care feature, 'Intercom' to identify technical problems</p>

		and troubleshoot. Continue iterating on EasyPeasy features to maximise engagement and deliver a high quality user experience for parents.
12 Post-test data collection	<p>1. Schools lose interest in the trial and don't grant permission for post-testing</p> <p>2. Selected children are absent on the day of the assessment. Parents are not at home for the home visit.</p> <p>3. Assessments are lost before received at Durham or loss of data from databases at Durham.</p>	<p>1. Wait list incentive which will be withheld if post-testing does not happen. Feed-back test scores to schools about their pupils' progress and development.</p> <p>2. Build in a mop-up contingency for extra visits to counteract absenteeism.</p> <p>3. Data management plan agreed which includes back-up arrangements</p>
13 Analysis of data	Durham staff unable to analyse data, e.g. long-term illness or loss of key staff	Durham will discuss possible extension to delivery date with EEF. Durham will seek support from Faculty.
14. Interpretation of findings	<p>1. It is possible that parents/schools in the control group will have used EasyPeasy and this might impact the findings</p> <p>3. The level of involvement of Pod Leaders could vary between schools and impact results</p>	<p>1. A wait-list incentive strategy is adopted to ensure that the 2017-18 control group of 3+ year old children do not ever receive the intervention.</p> <p>3. This is likely to be reflected in weekly pod updates that reflect parental engagement and can be considered in the CACE analyses.</p>
15 Production of final report	Durham staff unable to produce report, e.g. long-term illness or loss of key staff.	Durham will discuss possible extension to delivery date with EEF. Durham will aim to assign other staff to the project.

13 TIMELINE

Date	Activity	Responsibility
01/06/2017 – 31/08/2017	Project set-up meetings, contracts signed, protocol development, ethics and data protection <u>Recruitment of Local Authorities</u>	Evaluation team and EasyPeasy EasyPeasy
01/09/2017- 30/09/2017	Trial registration with ISRCTN	Evaluation team
31/08/2017 - 30/11/2017	Schools recruited with MoUs signed Collection of parental consent per school (minimum 10 perschool) Recruitment of test administrators through relevant agencies and training to conduct pre-randomisation tests	Led by EasyPeasy, supported by the Evaluation team Led by Evaluation team, supported by EasyPeasy Led by Evaluation team, supported by EasyPeasy
01/11/2017 - 23/01/2018	Pre-intervention data collection in schools by test administrators (CELF), teachers (CBSQ). Arrange mop-up revisits, up to 10% of schools should children have been absent at pre-testing phase Completion of usual practice survey by all schools	Led by Evaluation team, EasyPeasy to support logistics Evaluation team Evaluation team
01/11/2017 – 31/03/2018	Quality assurance of pre-test administrators	Evaluation team
19/12/2017	Randomisation and schools informed of allocation – Batch 1	Evaluation team to randomise and EasyPeasy to inform schools
02/01/18 - 31/01/2018	50 HOME visits (25 control group and 25 intervention group) conducted post randomisation and pre-intervention.	Evaluation team
11/01/2018 - 12/01/2018	Pod Leader training – Batch 1	EasyPeasy
23/01/2018	Randomisation and schools informed of allocation – Batch 2	Evaluation team to randomise and EasyPeasy

		to inform schools
20/01/2018 - 09/06/2018	Intervention (20-weeks) Batch 1	EasyPeasy
30/01/2018 – 06/02/18	Pod Leader training – Batch 2	EasyPeasy
10/02/2018 – 30/06/2018	Intervention (20-weeks) Batch 2	EasyPeasy
26/02/2018 – 09/03/2018	Longitudinal Case Study - Two schools in intervention group to participate in a telephone interview	Evaluation team with support from EasyPeasy to recruit schools and feedback on themes
01/03/2018 – 15/06/2018	Test administrator recruitment and training to conduct post-intervention tests	Evaluation team
22/04/18	Detailed statistical analysis plan produced and submitted to EEF	Evaluation team
23/04/2018 – 04/05/2018	Cross-sectional Case Study - Two schools in intervention group will participate in an in-school face-face interview mid-way through the programme.	Evaluation team with support from EasyPeasy to recruit schools and feedback on themes
26/05/2018 – 18/07/2018	Pod leader survey for intervention schools	Evaluation team, with support from EasyPeasy to provide feedback on the survey questions
28/05/2018 – 25/06/2018	Cross-sectional Best Practice Case Study - Towards the end of the project, a further two schools in intervention group will participate in a best practice case study (Interview with Pod Leaders/focus groups with parents) – date dependent on whether schools are batch 1 or 2	Evaluation team with schools selected and recruited by EasyPeasy and EasyPeasy providing feedback on themes
10/06/2018 – 20/07/2018	Post-intervention data collection for 50 HOME visits (25 control group and 25 intervention group)	Evaluation team
18/06/2018 – 25/06/2018	Longitudinal Case Study - Two schools previously interviewed early in the intervention will participate in a face-to-face interview with pod leader and parent focus group towards the end of the trial	Evaluation team

11/06/2018 – 29/06/2018	Batch 1 schools post-intervention data collection in schools by test administrators (CELF), teachers (CSBQ, Usual Practice Survey).	Evaluation team
11/06/2018 – 31/07/2018	Quality assurance of post-intervention test administrators	Evaluation team
02/07/2018 – 20/07/2018	Batch 2 schools post-intervention data collection in schools by test administrators (CELF), teachers (CSBQ, Usual Practice Survey).	Evaluation team
15/07/2018 - 31/12/2018	Collate data, analysis and report writing	Evaluation team
01/08/2018 – 31/08/2018	Interview with the developers	Evaluation team
01/09/2018 – 01/11/2018	Collection of children's school destination data	Evaluation team
31/10/2018	Final report	Evaluation team
31/01/2019	EYFSP report	Evaluation team

The timeline table has been updated in version 2 of the protocol to reflect the changes made to the evaluation detailed throughout.

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15 APPENDIX A: PROTOCOL AMENDMENTS AND REASONS

Page	Section	Protocol amendment	Reason
1	Evaluation summary table	Updated with actual number of pupils assessed at pre-test and schools signed up to the project	Recruitment and pre-testing complete at time of protocol update and actual numbers known
1	Evaluation summary table	Updated protocol date and version number	To reflect updated protocol
1	Chief evaluator	Updated to include Vic Menzies as maternity cover	To reflect change in personnel since the project started
1	Authorship	Updated to include Vic Menzies and Helen Cramman as authors of the protocol amendment	To reflect change in authorship for protocol amendment
	Throughout Protocol	Removed reference to EasyPeasy as an app.	Request of EasyPeasy team to reflect intervention more accurately
5	Background, significance and intervention: What? Materials used	Training time updated from approximately two hours to one and a half hours	To reflect actual training delivered during the project
5	Background, significance and intervention: What? Materials used	Added in 'SMS' to details of how parents access the intervention	Request of EasyPeasy team to reflect intervention more accurately
6	Background, significance and intervention: Who? Providers/implementers	Added in detail of Pod Leader cascading training to their team using EasyPeasy materials	Request of EasyPeasy team to reflect intervention more accurately
7	Background, significance and intervention: Who? Providers/implementers	Changed 'Pod Leader' to 'trained practitioners' being responsible for parent recruitment.	Request of EasyPeasy to reflect intervention more accurately
7	Background, significance and intervention: Tailoring and adaptation	Changed the wording on what opt-in parental consent was required for from 'participation in EasyPeasy' to 'participation in the project'	To accurately reflect what consent was required for.

7	Background, significance and intervention: tailoring and adaptation	Changed date for when parents will receive intervention from 'January 2018' to 'January 2018/February 2018'	To reflect the actual delivery date of the intervention in two batches due to delays with pre-testing/schools returning paperwork
8	Background, significance and intervention: tailoring and adaptation	Changed nursery and reception children being placed in different Pods and managed by different Pod Leaders to all children being placed in one Pod and managed by the trained Pod Leader(s)	Request of EasyPeasy to reflect actual delivery of intervention
Throughout	Methods	Updated tenses to reflect what has been done and what is still to be done	EEF request to clarify protocol
12	Randomisation	Added in who undertook the randomisation	This information was missing from the original protocol
12	Randomisation	Updated that eligible cohort size was measured by the total number of children consented per school	No detail given in previous protocol and this data was had for all schools participating
12	Randomisation	Updated that randomisation was conducted in two batches and included details of this	Delays to pre-testing meant that not all schools had completed pre-testing by the date originally planned for randomisation. EEF, EasyPeasy team and evaluation team agreed that randomisation and the intervention start could take place in two batches so that those who had completed assessment could start the intervention as planned in January 2018.
13	Schools	Updated number of schools (changed from 108 to 102) and number of families per school (from 13 to 10) providing details of issues with recruitment and discussions had during recruitment and testing	Issue with schools returning required paperwork and with organising testing meant that the targeted number of schools were not fully recruited to the trial during the recruitment period. This led to discussions between delivery team, EEF and

		stage regarding acceptable sample size.	the evaluation team regarding acceptable numbers for the trial which are now reported here.
13	Schools	Included number of LAs originally planned to be contacted and the number actually recruited	The original number was missing from the protocol and to update based on what occurred.
13	Schools	Added in the number of eligible schools contacted during recruitment to the trial	To update the protocol based on what occurred.
14	Schools	Provided an update that no recruitment events were required and removed details of what these recruitment events would involve.	To update the protocol based on what actually occurred.
15	Parents/Carers and children	Clarified that parents were able to opt out of the evaluation but still take part in EasyPeasy	Wording didn't make meaning clear.
16	Primary Outcome	Provided an update of the specific CELF score that would be used as the primary outcome.	To provide more detail than was included in the original protocol.
17	Primary Outcome	Number of pupils updated based on actual numbers in the trial	Original number not correct.
17	Primary Outcome	Clarification provided of who assessors would be	To clarify who assessors would be.
17	Primary Outcome	Provided an update on recruitment of test administrators based on pre-testing and changes made for post-testing.	Changes were made to how assessors would be recruited following issues with pre-testing.
17	Primary Outcome	Described what test administrator training involved	This was missing from original protocol
17	Primary Outcome	Described change in quality assurance process for CELF assessment from evaluation team observer to all test	This change was deemed more thorough and was less likely to affect the behaviour of test administrators.

		administrators' audio recording assessment.	
18	Secondary Outcomes	Clarified statement about the subscales of the HOME measure that would be used	Meaning in the original protocol was not clear.
19	Secondary measures	Changed research associate and research assistant to researchers.	The timescale for delivering HOME visits means that more researchers are required.
19-20	Sample size calculations	Updated based on recalculation done by EEF following discussion between EEF, developer and evaluator at pre-testing period when recruited sample was lower than originally planned.	All three teams wanted to revisit assumptions for sample size calculations and agreed updates are included here.
22	Research Questions	Removal of parental qualification from Q10 and addition of child's Special Educational Needs and English as an Additional Language	Difficulty in collecting parental qualification data while other data already provided by parents.
22	Design summary	Removal of data collected from weekly Pod report being used to track implementation fidelity and parental engagement.	Consent doesn't allow this data to be shared with the evaluation team.
22	Design summary	Clarified what the four cross-sectional case studies are and when they will take place.	It has been raised that this detail wasn't clear in the original protocol.
23	Monitoring fidelity and compliance	Section has been rewritten based on discussions between EEF, EasyPeasy team and evaluation team about data that would be available.	This hadn't been finalised in original protocol and amendments were required based on availability of data.
24	School case studies	Clarification of when case studies will take place	To clarify when case studies would take place
24	School case studies	Best practice selection criteria updated to include positive reports	Original version only included number of playdates however this

		of impact from Pod Leader to EasyPeasy	doesn't take into account perceived impact.
25	School case studies	Updated maximum length of time interviews could take	To provide more detailed information
27	Ethics and registration	Included trial registration number	To include updated information
27-28	Personnel	Updates included to staff on the project and the dates of their involvement if not for the full length of the project.	Some staff members have gone on maternity leave and others have changed jobs. Information is now up to date.
19	Personnel	Included details of the EasyPeasy developer team and their roles	Missing from the original protocol
37-38	Timeline	Updated timeline and reordered to reflect changes in protocol	To reflect changes detailed in the protocol.