Education
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PROJECT TITLE	Hanen Learning Language and Loving It (LLLI)
DEVELOPER (INSTITUTION)	The Hanen Centre
EVALUATOR (INSTITUTION)	National Centre for Social Research
PRINCIPAL INVESTIGATOR(S)	Fatima Husain
PROTOCOL AUTHOR(S)	Lydia Marshall, Daniel Phillips, Robert Wishart
TRIAL DESIGN	Two-arm cluster randomised controlled efficacy trial with random allocation at nursery level
PUPIL AGE RANGE AND KEY STAGE	3 to 4 years old, Early Years
NUMBER OF SCHOOLS	140
NUMBER OF PUPILS	2,380
PRIMARY OUTCOME	British Picture Vocabulary Scale (BPVS)
SECONDARY OUTCOME	Renfrew Action Picture Test (RAPT)

Protocol version history

VERSION	DATE	REASON FOR REVISION
1.0 [*original*]		

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Intervention

Learning, Language and Loving It™ - The Hanen Program® for Early Childhood Educators (Hanen LLLI) is a training program for early years (EY) practitioners to promote social, language and literacy learning in nurseries. It is a continuing professional development (CPD) program designed to provide staff with practical strategies to enhance children's communication and language skills through specialised ways of interacting and communicating with children during normal daily routines. Hanen LLLI is not widely used in the UK, with a handful of Hanen training programs having been run in the past two years, focusing mainly on a shortened version on Hanen LLLI, called Teacher Talk.

Intervention delivery

Hanen LLLI was developed by The Hanen Centre[1], based in Canada. In this evaluation the intervention will be coordinated and delivered by Communicate SLT CIC, a speech and language therapy organisation based in the North West of England. Communicate SLT are Hanen-certified trainers for some of the Hanen programs but are otherwise not affiliated in any way with The Hanen Centre.

Mode of delivery

The intervention will be delivered across 31 weeks, including orientation meetings to explain the intervention and evaluation, eight training workshops lasting 2.5 hours each, six individual video feedback sessions per practitioner and a pre-intervention video and post-intervention video. The training workshops are delivered to groups of 10-20 practitioners by qualified and Hanen-certified speech and language therapists (SLTs). These SLTs, known as Program Leaders, are fully qualified in the UK and are certified Learning Language and Living It trainers (LLLI trainer) accredited to deliver the Hanen program. The individual feedback sessions are also led by Program Leaders and take place one-to-one in practitioners' own nurseries. They focus on guided reflection, with Program Leaders providing feedback on videotaped interactions between EY practitioners and children. Practitioners also take part in two further recorded interactions with children – once at the beginning of the program and once at the end – to establish a baseline level to guide delivery of the intervention and for practitioners' own reflection after the intervention.

The intervention activities are prescribed by The Hanen Centre and non-specified adaptations of the course and training materials and handouts are neither allowed nor encouraged. Minor accepted deviations are detailed in the course handbook for Program Leaders.

Intervention content

Program Leaders are expected to help facilitate the four broad aims of Hanen LLLI:

- Education: provide practitioners with information on language, social and literacy development and on how best to promote these during everyday play activities, conversations and daily routines
- Application: provide practitioners with opportunities to practice and apply strategies and approaches which promote children's development, with feedback from the LLLI Program Leader
- Collaboration: work together with practitioners as they plan and implement individual programmes for children with specific needs
- Peer support: give practitioners the opportunity to share ideas, issues, and concerns with their colleagues

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[1] The Hanen Centre's mission is to enable parents and professionals to transform their daily interactions with young children to build the best possible lifelong social, language and literacy skills

Trainers are instructed to use the 4P teaching cycle while providing training:

1. Prepare: Give practitioners a reason for learning by starting with asking them to think about what a particular topic means to them in order to tap into personal experience and interest.
2. Present: Present facts and information to deepen or expand knowledge in ways that are interesting, interactive, relevant and enjoyable
3. Practice: Create opportunities for practitioners to practice newly learned skills in a variety of hands-on ways with guidance and feedback
4. Personalize: Provide opportunities for practitioners to apply and integrate information into their own situation and to generalise into a variety of situations.

During the program, practitioners learn practical strategies for engaging with children to enhance their language development, including for example:

- "OWL" - observe, waiting and listening, rather than asking questions
- Using a variety of words and modelling extended language
- Providing opportunities for children to initiate conversation
- Engaging 'reluctant' children in small groups
- Tailoring language and approach to match children's styles and skills

Study rationale and background

Early language skills are a crucial building block for children's development. Children naturally develop language skills at different rates, but some children fall behind at an early age. Depending on the measures used, 7 to 15 per cent of preschool children are defined as experiencing language difficulties and 14 to 18 per cent do not reach the expected level in the Communication, Language and Literacy domain of the Early Years Foundation Stage (EYFS) Profile (Law *et al.*, 2017). Children from socially disadvantaged backgrounds are, on average, much more likely to experience delays and difficulties.

The importance of language skills is reflected in the EYFS. Reforms to the Early Learning Goals are currently underway in response to a recent review of Reception year which recommended greater focus on oral language and vocabulary development (Ofsted, 2017a).

A key determinant of language development is the amount and quality of language to which a young child is exposed. Given that over 95 per cent of 3-4-year olds participate in formal early education (DfE, 2018a), early years practitioners play an important role. Although the majority (88 per cent) of EY settings are assessed by Ofsted as being good or outstanding (Ofsted, 2017b), the early years workforce is comprised predominantly of Level 3 qualified staff (below degree level) (DfE, 2018b) and recent research points to a downward trend in qualifications (EPI, 2018). It is likely, therefore, that the workforce would benefit from CPD targeted at language.

A recent review of language interventions by Law *et al.* (2017) recommended further research on the effectiveness of training early years practitioners to deliver programmes within EY settings. The review reported on three studies on Hanen LLLI. An efficacy trial by Girolametto *et al.* (2003) in which 16 US teachers of 3 to 5-year-olds were randomly assigned to receive training in Hanen LLLI found that pupils engaged in shared reading and playdough activities used a greater number of utterances (d = 1.3; d=1.5), multiword combinations (d = 1.2; d=1.2), and peer directed utterances (d = 0.8; d=0.9). However, the number of different words did not differ by group. Cabell *et al.* (2011) reported on an RCT of a programme that trained 49 teachers of 3 to 5-year-old kindergarteners in the US in Hanen LLLI. The evaluation found no impact on oral language outcomes but that the treatment group outperformed the control group by 1.5 standard deviations for expressive vocabulary. Piasta et al. (2012) reported on an RCT of a US programme based on Learning Language and Loving It, in which 49 preschool early years practitioners received training. The authors found an impact on total utterances, (d = 3.18), number of different words or NDW (d = 5.30), mean length of utterance, (d = 4.96). Follow up NDW was (d = 2.75). Overall, the review found that Hanen LLLI was particularly promising with high effect sizes (albeit based on low security of findings) for the impact of professional

development on EY practitioners' conversational responsivity and children's linguistic productivity and complexity (Law *et al.*, 2017). The authors concluded that the majority of language interventions focus on improving vocabulary, whereas LLLI recognised the importance of conversation and oral narrative.

A handful of Hanen training programs have been run in the UK in the last few years, focusing mainly on a shortened version of Hanen LLLI, called Teacher Talk. As yet, no trials of Hanen LLLI have taken place in the UK. A small-scale pilot evaluation of Hanen LLLI conducted by NatCen Social Research for the EEF found the intervention to be attractive to early years settings and showed evidence of promise regarding changes to practitioners' interactions with children[2]. The pilot was not powered to investigate impact on children's language and development, which this efficacy trial will seek to measure.

An intervention logic model was developed and finalised as part of the pilot evaluation, and can be found in the Appendix to this protocol. Delivery in the trial will follow the model of delivery in the pilot, albeit at a larger scale.

Impact Evaluation

Research questions

The impact evaluation of Hanen LLLI aims to answer the following research questions:

- What is the impact of Hanen LLLI on the language attainment of 3 to 4-year-olds?
- Does the impact of Hanen LLLI differ by Early Years Pupil Premium status?

Design

The evaluation will be conducted as a two-arm cluster (setting-level) randomised controlled efficacy trial of the effect of Hanen LLLI on the language attainment of 3 to 4-year-olds in nursery settings.

A randomised controlled trial (RCT) uses the mechanism of randomisation to assess the causal impact of an intervention. Randomisation, if conducted correctly, should result in there being no important differences between treatment and control groups in the main determinants of our outcomes of interest. Any differences at baseline are due to chance and are accounted for in the statistical analysis. As a result, any discrepancy in outcomes at the end of the trial can be attributed to the intervention itself. As an efficacy trial, the evaluation aims to test the effect of the intervention in ideal circumstances. Hanen LLLI is designed to enhance children's communication and language skills. The primary outcome of interest is receptive English language as measured by the British Picture Vocabulary Scale (BPVS)[3] and the secondary outcome provides a further measure of receptive and expressive English Language, as measured by the Renfrew Action Picture Test (RAPT)[4]. The outcome measures selected to evaluate the effectiveness of Hanen LLLI reflect the fact that changes in vocabulary appear quite early in the intervention's logic model (see Appendix). This choice of outcome measure is also supported by Law *et al.*'s recommendation that an efficacy trial of Hanen LLLI should examine outcomes such as "vocabulary (receptive and expressive), narrative skills, and pre-reading skills" (Law *et al.*,2017: 58).

Nurseries assigned to the control condition will implement a business-as-usual approach to language teaching. An incentive of £1,000 is being offered to all control nurseries to participate in the trial. The incentive is intended to mitigate the risk that nurseries are approached about the trial but choose instead not to participate once assigned to the control group. Nurseries will be required to provide background information on all eligible pupils at the start of the academic year in September 2019. This will include Early Years Pupil Premium status, date of birth, pupil first name and surname. We will also collect nursery name, address and postcode, and unique school identifiers. This pupil

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[2] The EEF project page for the pilot can be found here.
[3] https://www.gl-assessment.co.uk/media/2308/glassessment-ptm.pdf
[4] http://talkingpoint.org.uk/slts/assessment-children-slcn/expressive-language-assessments

information will be collected in an Excel spreadsheet template and uploaded by nurseries using a secure NatCen website upload platform.

Trial type and number of arms		Two-armed cluster randomised trial
Unit of randomisation		Nursery
Stratification variables (if applicable)		Geographic region
Primary outcome	variable	Language attainment
	measure (instrument, scale)	British Picture Vocabulary Scale (BPVS) (receptive language) BPVS raw score
Secondary outcome(s)	variable(s)	Language attainment
	measure(s) (instrument, scale)	Renfrew Action Picture Test (RAPT) (expressive and receptive language) RAPT raw score

Randomisation

Nurseries agreeing to participate in the trial will be allocated to one of the two groups using stratified randomisation by geographic region, with a 50:50 ratio of nurseries between treatment and control. Stratification by geographic region will help control for possible differences in implementation and may thereby decrease the variance of the impact estimator. It may also help the developer in planning the Hanen LLLI training by reducing the likelihood that a given region will have an exceptionally high ratio of treatment settings to control settings, or vice-versa. Randomisation will be undertaken in Stata and both *do* and *log* files will be used to record the randomisation process. At time of randomisation, analysts will be blinded to nursery identity. Nursery identifiers will then be merged with group allocation data after randomisation.

Participants

Communicate SLT will identify and recruit eligible nurseries, with NatCen advising on eligibility criteria and communicating the requirements for research participation.

(1) Setting-level eligibility:
   a. Only school-based nurseries and maintained nursery schools are eligible to be part of this trial. This selection criterion was introduced to facilitate longitudinal tracking of pupils' outcomes. Pupils in school-based nurseries and maintained nursery schools will have been allocated a Unique Pupil Number (UPN), whereas pupils attending a PVI setting are less likely to have a UPN.
   b. Nurseries will be given a recommendation of signing up two-thirds of staff working with 3 to 4-year-olds to take part in Hanen LLLI, but the minimum requirement will be that at least 50 per cent of eligible practitioners including a teacher should be able to participate.
   c. No more than 50 percent of practitioners in a nursery should have previously participated in a similar Hanen intervention named 'Teacher Talk' and none should have previously participated in Hanen LLLI.
   d. Nurseries should have around fifteen 3-4-year-olds to be included in the trial sample. However, there may be a few nurseries that have only twelve 3-4 year olds.
(2) Practitioner-level eligibility:
   a. Participating practitioners should not have taken part in Teacher Talk.
   b. Other than this, nursery managers will be able to select practitioners to take part on any basis and will identify the staff who will take part in the program if they are randomised to the treatment group *before* randomisation. The IPE will explore the criteria that managers use to select staff to participate in the program.

By the autumn term of 2019, all participating nurseries will need to have completed a Memorandum of Understanding (MoU) which will include institutional consent to be involved in the study. Once participating nurseries are identified, they will be required to inform parents of all prospective eligible 3-4-year-olds about their nursery's participation in the trial by letter. A research information sheet and privacy notice will be supplied by NatCen explaining that nurseries' access to the program will be allocated at random and that participation in the evaluation will involve the collection and processing of children's personal data. Once parents have been informed, nurseries will be requested to enumerate 3-4-year-old children. In each nursery, seventeen children will be randomly sampled from all 3 to 4-year-olds in that nursery to be tested at baseline[5]. All pupils that complete baseline tests will be included in the trial and subsequently tested at endline. The target of seventeen per nursery has been set to allow for possible absences at baseline testing or for potential attrition between baseline and endline testing. We will schedule 'mop-up' testing sessions to test any pupils absent on the first date of testing.

Sample size calculations

Table 1 Sample size calculations

		OVERALL	EYPP[6]
MDES		.19	.30
Pre-test/ post-test correlations	level 1 (pupil)	0.36	0.36
	level 2 (school)	0.18	0.18
Intracluster correlations (ICCs)	level 2 (school)	0.15	0.15
Alpha		0.05	0.05
Power		0.8	0.8
One-sided or two-sided?		2	2
Average cluster size*		17	2
Number of schools	Intervention	70	70
	Control	70	70
	Total	140	140
Number of pupils	Intervention	1,190	169**
	Control	1,190	169**
	Total	2,380	338**

*We assume 17 pupils per nursery will be sampled. These will be randomly selected from all 3 to 4-year-old pupils in nurseries. It is possible that some nurseries may have fewer than 17 pupils aged 3-4, in which case all eligible pupils will be included in the sample.
**Proportion of FSM pupils anticipated to be national average for age group (nursery and primary school age) of 14.2%, as in DfE (2018c).

The Hanen LLLI trial is intended to incorporate 140 nurseries, with 70 randomly allocated to a treatment condition in which nurseries receive the Hanen LLLI intervention and the other 70 randomly allocated to a 'business as usual' control condition. Communicate SLT will aim to over-recruit by 5% (n=147) in order to allow for any pre-baseline drop out over the summer break. If more than 147

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[5] It is possible that some nurseries may have fewer than 17 pupils aged 3-4, in which case all eligible pupils will be included in the sample.
[6] We note that EEF protocols usually include sub-group analysis by Free School Meal (FSM) status. However, we use Early Years Pupil Premium (EYPP) here in preference to FSM as EYPP data is available directly from settings, whereas FSM is not. EYPP provides schools with additional funding for all 3-4 year-olds from low-income families. All EYPP pupils are also eligible for FSM.

nurseries are successfully recruited, Communicate SLT will select nurseries to take part based on geographical proximity to workshop locations (to avoid attrition where staff find it difficult to attend).

For education programmes, the variance explained by pre-test scores can be relatively high if pre-test scores are used in adjusted analysis (Bloom *et al*, 2007). Our pre- and post-test correlations are informed by Torgerson and Torgerson (2013), who reference a pre-test post-test correlation of 0.7. School-level intra-cluster correlations (ICCs) draw on the ICCs found by Husain *et al.*'s (2018) Family Skills evaluation (.15 class-level and .02 school-level ICCs), together with information provided in Demack's (2019) paper exploring ICCs for early years programmes.

The calculations were undertaken using PowerUp! and indicate that this study is powered to detect an effect of 0.19 standard deviations based on the above assumptions. The calculations do not account for possible attrition over the course of the evaluation.

Outcome measures

The primary outcome of interest is English language ability, measured using the British Picture Vocabulary Scale (BPVS). This scale will also be used as a measure of baseline attainment. BPVS tests a child's receptive vocabulary by asking children to identify pictures that illustrate a given word's meaning. The BPVS will be collected at baseline by Speech and Language Therapists (SLTs) in October 2019 and at endline towards the end of the summer term 2020[7].

The Renfrew Action Picture Test (RAPT) will be analysed as a secondary measure of attainment. RAPT uses pictures to test children's receptive and expressive language by asking them to describe pictures that they are shown. It will be collected at endline by SLTs at the end of the summer term in 2020. In providing a measure of expressive, as well as receptive, language, RAPT offers an assessment of an outcome slightly further along the causal chain contained within the intervention's logic model.

Speech and Language Therapists (SLTs) will administer and mark both tests[8]. SLTs will not be directly informed of nurseries' treatment allocation and randomisation of nurseries will take place after baseline testing. However, at endline nursery staff will know of their treatment allocation and therefore it will not be possible to ensure SLTs are blinded to treatment allocation when administering and marking endline tests.

Analysis plan

Hanen LLLI will be evaluated as a two-level, cluster randomised control trial. The outcomes of pupils in nurseries allocated to Hanen LLLI will be compared with pupils in nurseries allocated to 'business as usual' nurseries. The primary analysis will evaluate the impact of the intervention on an in intention-to-treat (ITT) basis using the BPVS endline raw score as the primary outcome measure, as per the latest EEF Analysis Guidance (Education Endowment Foundation, 2018).

To account for the clustering of pupils within nurseries, the impact will be estimated using a two-level multilevel regression model with pupils at level one and nurseries at level two. The BPVS endline raw score will be regressed on a binary indicator of treatment allocation, the BPVS raw score at baseline, geographic region, and will include a random effect to account for the variance at school level. The analysis of the secondary outcome, the Renfrew Action Picture Test (RAPT), will follow the same approach as that for the primary outcome.

For both primary and secondary outcomes, the impact will be presented as a Hedge's *g* effect size, accounting for the clustering of pupils in schools with 95% confidence intervals (Hedges, 2007).

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[7] Nurseries will not be informed of the baseline outcome but can opt to receive endline results after endline testing.
[8] Hanen LLLI also uses SLTs as Program Leaders to lead the training of staff. Different SLTs will administer the tests from those who will act as Program Leaders.

One sub-group analysis will be conducted, exploring if Hanen LLLI has a differential impact depending on a pupil's Pupil Premium (EYPP) status. To analyse impact by EYPP status, a similar model to that described above will be estimated, with the addition of a binary indicator of EYPP status interacted with the treatment allocation indicator. If a significant relationship is identified, a separate model will be estimated to explore differential effects for pupils eligible for EYPP.

Implementation and process evaluation

A process study will be carried out alongside the impact study to address the following research questions:

- How is Hanen LLLI delivered, and what are the facilitators and barriers to delivery?
- What are the perceived benefits of the program for EY practitioners, nurseries and children?
- What is the per-pupil cost of the intervention?

The key dimensions of implementation that will be assessed are: fidelity (including dosage, quality, and adaptation), reach, responsiveness and usual practice (programme differentiation and monitoring of control).

Table 2 shows how the IPE methods will address each of these dimensions.

Table 2 IPE domains and methods

Domain	Method							
	Workshop observations	Early implementation interviews	Site visits	Ongoing delivery interviews	Program Leader interviews	Usual practice interviews	Practitioner survey	Attendance registers
Fidelity	●		●		●			
Dosage								●
Quality	●		●					
Adaptation	●		●					
Reach		●	●				●	●
Responsiveness	●	●	●	●			●	
Usual practice		●				●	●	

Methods

We propose a mixed-method approach, designed to gather both breadth of data through surveys and depth through qualitative interviews, observations and site visits.

IPE sampling

We will sample 10-12 treatment nurseries to take part in early implementation interviews and a further 8-12 to take part in site visits[9]. We will adopt a purposive sampling approach, using contextual nursery level data (e.g. size, local authority) to ensure a diverse sample. Ongoing delivery interviews will be conducted with a sub-sample of these nurseries, meaning that a total of 18-24 treatment nurseries will be included in the in-depth IPE data collection. This sub-sample will be purposively selected using contextual nursery level criteria and findings from the early implementation interviews and site visits, in order to achieve diversity. We will sample 6-8 control nurseries to take part in the usual practice interviews using similar criteria to ensure that a range of nurseries are included.

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[9] Final sample sizes will be determined by the diversity of the nurseries taking part in the trial (the more diverse the trial sample, the more nurseries we will need to include in the IPE in order to capture this diversity); the diversity of opinions being expressed in interviews (we will seek to achieve theoretical 'saturation'); and pragmatism (for example, if recruitment for the IPE activities is challenging, we will balance the risks of a smaller IPE sample against the risks of discouraging nurseries from remaining in the trial).

The online practitioner survey will be sent to all practitioners who were nominated to take part in the Hanen program prior to randomisation, across all participating nurseries (treatment and control).

Observations of the Hanen LLLI program

To gather information on the coverage and delivery of the Hanen LLLI program and practitioners' responsiveness to it [*fidelity, quality, responsiveness, adaptation*], we will observe 8-12 workshops. These workshops will be selected to ensure that a number of Program Leaders are included in the observations. The observations will include the first and final workshops, plus at least two more sessions through the course. We will aim to observe two or more Program Leaders delivering the same workshops, in order to capture variation and adaptation. We will also observe video feedback sessions during the case study site visits (see below).

Interviews with nursery staff

To understand how nurseries participate in Hanen LLLI, barriers and facilitators to delivery and perceived impacts, we will conduct interviews with treatment nurseries in the autumn term 2019 ('early implementation') and late spring/summer term 2020 ('ongoing delivery'). We will also conduct interviews with staff in control nurseries in spring 2020 to understand *usual practice* and how this compares with the strategies encouraged by the Hanen LLLI program.

- *Early implementation interviews* (n=10-12) with treatment nurseries will gather contextual information on the nursery and their practice [*usual practice*], how the nursery will support staff to attend workshops (including planning cover) [*responsiveness*], and any challenges anticipated during the intervention. Interviews will be conducted with senior members of staff (nursery teachers or managers) via telephone and last approximately 30 minutes.

- *Ongoing delivery interviews* (n=10-12) with treatment nurseries will explore how delivery of the Hanen LLLI workshops and training has been progressing [*quality*], any cascading of Hanen LLLI principles to non-trained staff [*reach*], and perceived impacts on staff practice, the nursery environment and children [*responsiveness*]. They will also gather data on whether practitioners and nurseries intend to continue implementing Hanen LLLI principles beyond the end of the trial. Interviews will be conducted with senior members of staff (nursery teachers or managers) via telephone and last approximately 40 minutes.

- *Usual practice interviews* (n=6-8) with control nurseries will gather data on *usual practice* in nurseries, including engagement with any communication and language development interventions. Interviews will be conducted with senior members of staff (nursery teachers or managers) via telephone and last approximately 30 minutes.

IPE site visits

To gain an in-depth understanding of how the intervention is being experienced and delivered by practitioners and nurseries, we propose conducting 8-12 site visits to treatment nurseries using qualitative methods (interviews and observations). Each site visit will include:

- *Observation of video feedback sessions* (1 per site visit)[10] to understand the content of these sessions [*fidelity, quality, adaptation*], practitioners' *responsiveness*, and any barriers and facilitators to delivery.

- *Interview with senior staff member* (nursery teacher or manager – 1 per site visit) to understand barriers and facilitators to ongoing engagement with Hanen LLLI, barriers and facilitators to success and perceived impacts (positive and/or unintended) for staff practice, the nursery environment and children's language and communication development [*reach, quality, responsiveness*].

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[10] Where nursery timetables allow we will schedule site visits to coincide with video feedback sessions. We anticipate that this will not always be possible but will conduct a minimum of six observations.

- ***Interview(s) with trained practitioner(s)*** (1-2 per nursery) to understand *responsiveness* to the intervention, barriers and facilitators and perceived impacts.

Interviews with program leaders

We understand that there will be around 7-13 Program Leaders delivering Hanen LLLI in the trial. We will interview 4-6 Program Leaders in the spring term 2020 to provide evidence on the delivery of training and video feedback [*fidelity*], any variations in delivery [*adaptation*] and perceived acceptability and perceived impacts of the program [*responsiveness, reach*] and recommendations for intervention improvements from the perspective of these expert trainers. These interviews will last approximately 30 minutes and where possible will be conducted face-to-face following observations of video feedback as part of the site visits (see above). Telephone interviews will be offered as an alternative.

Practitioner survey

Changes in staff practice are a crucial element of the intervention logic model for Hanen LLLI. We will employ a short web survey to capture information about practitioners' interactions with children and compare practices across treatment and control nurseries. The survey will be conducted post-intervention, at the end of the year, and will use vignettes to assess how staff would interact with children in different scenarios. Answers will be scored to assess how in line with Hanen LLLI strategies staff practices are and will provide evidence on the differences between practitioners in treatment nurseries who have taken part in the program and practitioners in case study nurseries who have continued with usual practice.

For staff in treatment nurseries, the survey will also ask for brief feedback on the intervention [*responsiveness, reach*]. For staff in the control group, the survey will include a small number of questions about any similar interventions (i.e. CPD about interactions with children, early language and development) that staff have taken part in [*usual practice*].

Analysis

All qualitative interview data will be digitally recorded with permission from participants and professionally transcribed. Framework in Nvivo will be used to manage the data and carry out within and cross-nursery analysis. Descriptive and cross-tab analysis of survey data will be conducted using SPSS. Triangulation of all data and thematic synthesis by the main implementation domains will provide a comprehensive assessment of implementation and help to explain the impact evaluation findings.

Compliance

A measure of compliance will be constructed according to staff attendance at Hanen LLLI training. The Hanen LLLI program includes eight training sessions and six individual feedback sessions, which focus on guided reflection, with Program Leaders providing feedback on videotaped interactions between EY practitioners and children. To be eligible to take part in the intervention, a nursery must be able and agree to release a minimum of 50% of its eligible staff for the training. 'Staff' includes nursery teacher(s), plus nursery nurses, teaching assistants (Tas), and/or other more senior staff.

Attendance at training will be captured via a register designed by NatCen and completed by Communicate SLT.

A measure of compliance will be constructed as follows:

- Nurseries will be given one point for each session (where a session can be either the eight training workshops or the six individual video feedback sessions) attended by a teacher, up to a total of fourteen.

- Two further points will be awarded to any nursery where the head-teacher (or equivalent) attends at least one training workshop.

- Nurseries will be awarded further points for the proportion of sessions (where a session can be either the eight training workshops or the six individual video feedback sessions) attended by any *additional*[11] staff who have been nominated to attend training, up to a total of four points. The proportion of sessions attended on average by any *additional* nominated staff will be used to calculate additional points. For example, if average additional staff attendance for a particular nursery is 25 per cent or more, the nursery will be awarded an additional one point (≥ 50%, 2 points; ≥ 75%, 3 points; 100%, 4 points;).

The total score will then be summed to produce a scale of compliance with a possible range of $0 \leq Comply_A \leq 20$.

This data will also be used to assess dosage and reach for the IPE.

Cost evaluation

We propose to collect cost data consistent with EEF guidelines[12]. There will be two sources of cost data:

- ***Cost-proforma sent to Communicate SLT*** to calculate the cost of delivering the Hanen LLLI workshops, video feedback sessions and any other support for nurseries.

- ***Short web form sent to nursery leads*** to gather data on the costs of participation that fall on nurseries, such as the hours of supply cover needed for staff to attend workshops.

Findings from the pilot will inform the development of the templates for this data collection. The per pupil cost over three years will be estimated on the basis of annual average net costs to nurseries divided by the number of participating children.

Ethics and registration

NatCen's research information leaflet setting out the evaluation requirements for the evaluation will be sent to nurseries at recruitment stage. Nurseries that sign an MoU will send out a parent information leaflet to parents/carers of all eligible children. The information leaflet will explain the study; the research activities for the trial (including testing), data linkage to the National Pupil Database (NPD), the transfer and storage of anonymised data to the EEF's archive. Parents/carers will be able to object to their child's data being used for the evaluation at any point during the study by contacting the nursery or NatCen. NatCen will maintain a database of withdrawals and delete the appropriate level of pupil data as soon as a withdrawal is communicated.

Ethical approval for this study will be sought from NatCen's Research Ethics Committee in advance of research activities in the autumn term of 2019. The NatCen REC will review the study design to confirm compliance with internal ethical standards.

The trial will be registered with the International Standard Randomised Controlled Trial Number (ISRCTN).

Data protection

NatCen will store and handle all data securely and confidentially in line with the GDPR. Only the research team and approved third parties listed in the privacy statement (e.g. transcription agency, speech and language therapists conducting testing) will have access to the data collected as part of the evaluation. School and pupil-level data will be transferred to NatCen via a secure FTP. Reports and other publications arising from this research will not identify any individual nursery, staff member,

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[11] Not including the nominated teacher or the head-teacher or equivalent.
[12] https://educationendowmentfoundation.org.uk/uploads/pdf/EEF_guidance_to_evaluators_on_cost_evaluation_1.pdf

or pupil. Nurseries or individual staff who no longer wish to take part in the evaluation can request to have their data deleted at any point prior to the submission of the draft report.

NatCen will be the data controller and will additionally process data. The legal basis for processing the data is 'legitimate interest'. NatCen will process the data for the legitimate purpose of conducting the evaluation of Hanen LLLI. No special category data will be collected as part of the evaluation. We will issue a privacy notice to all concerned parties, which will also be published on the study [website].

All data will be securely deleted from NatCen's network six months after the end of the project.

Personnel

The intervention will be coordinated and delivered by Communicate SLT CIC, a speech and language therapy organisation based in the North West of England.

Table 3 Communicate SLT personnel

Delivery team		
Caroline Coyne	Director of HR and Operations	Project lead
Joanne Burr	Director of Finance and Business Development	Quality control
Lisa Chetter	Project manager	Project manager
Rhian Owen	Program Leader supervisor	Program Leader supervisor
Sally Wiseman	Program Leader	Speech and Language Therapist
Elizabeth Evans	Program Leader	Speech and Language Therapist
Kathryn Burkmar	Program Leader	Speech and Language Therapist
Adele Banton	Program Leader	Early Years Consultant
Jenny Kenrick	Program Leader	Speech and Language Therapist
Ann Shellard	Program Leader	Early Years Consultant
TBC	Program Leader	Speech and Language Therapist
TBC	Program Leader	Early Years Consultant
TBC	Program Leader	Early Years Consultant
TBC	Program Leader	Early Years Consultant

The evaluation will led by NatCen's Children, Families and Work Team, who will work closely with impact evaluation experts in NatCen's Evaluation Team. Speech and Language Therapists will be recruited using agencies to conduct the assessments with children.

Table 4 NatCen personnel

Children and Families Team		
Dr Fatima Husain	Interim Director, Children and Families	Principal Investigator. Overall study lead. Senior oversight of IPE.
Dr Jonah Bury	Senior Researcher	Project Manager, IPE and testing.
Molly Mayer Helen Burridge Phoebe Averill	Researchers	Working on all study stages and testing.

Evaluation Team		
Daniel Phillips	Research Director	Lead on impact evaluation.
Robert Wishart	Senior Researcher	Working on impact evaluation.

Risks

The main risks to this project will be low participation in the trial, low take up and compliance with the intervention, risks associated with schools not complying with the random allocation, and low response rates in the post-intervention pupil testing. NatCen will maintain a detailed risk register throughout the life of the project and manage risks on an on-going basis.

Table 5 Preliminary risk register

Risk	Likelihood / impact		Mitigation / Contingency
Difficulties recruiting the required number of suitable school nurseries	**Likelihood:** Medium		Communicate SLT CLC will need to recruit 140 nurseries schools. NatCen will provide clear, concise information on the evaluation requirements for communication with schools and be on hand to answer questions at the MOU signing stage. NatCen will also have a dedicated website and contact email/phone number to ensure the study is legitimate.
	Impact: High		Regular updates from Communicate to facilitate progress monitoring.
			Communicate will "over-recruit" up to 5% additional schools to allow for dropout over the summer holidays.
Low levels of compliance among nurseries	**Likelihood:** Medium		Low levels of compliance (i.e. nursery staff not attending training sessions or feedback sessions) may result in lack of statistical power for the impact analysis.
	Impact: High		NatCen will draft clear information leaflets for the evaluation, outlining required activities. Communicate SLT CLC will meet face-to-face with all nurseries in advance of the implementation delivery to fully explain the programme and answer any questions.
			Program Leaders will be trained in engaging nursery staff and will report any issues with attendance to Communicate SLT.
Nursery level attrition	**Likelihood:** Low		This will be addressed by setting out clearly the requirements for the trial in the MoU; communicating the financial incentive for control nursery clearly and providing nurseries with clear instructions at the start of the project on what needs to be done and when.
	Impact: High		
Pupil level attrition	**Likelihood:** Low		Pupil absence during testing and pupils leaving nurseries during the school year could both lead to pupil level attrition. Speech and Language Therapists will carry out mop up visits to ensure that as many children as possible are tested in each nursery at baseline and endline.
	Impact: Medium		
Nursery staff unable to find the time for interviews	**Likelihood:** Medium		Research activities involved for the evaluation will be clearly outlined in the MoU.
	Impact: Medium		NatCen researchers are experienced in making appointments for observations and interviews.
			Most interviews will be conducted by telephone to ensure flexibility and convenience for nursery staff.
			Different nurseries will be sampled for the case study visits to avoid over-burdening nurseries.

Timeline

Table 6 Evaluation timeline

Dates	Activity	Staff responsible/ leading
Jan-Mar 2019	Finalise recruitment materials	Communicate SLT NatCen
Mar-Jun 2019	Recruit nurseries, sign MOUs Schools nominate staff to take part in LLLI	Communicate SLT
July-August 2019	Randomisation	NatCen
Sep 2019	Parent information leaflets handed out Pupil lists sent to NatCen	Nurseries NatCen
Oct 2019	Baseline assessments Schools informed of randomisation (after testing)	NatCen
Nov 2019 – May 2020	Intervention delivery	Communicate SLT
Nov 2019 – May 2020	Workshop observations	NatCen
Dec 2019	Early implementation interviews	NatCen
Jan – Mar 2020	Case study visits Interviews with Program Leaders	NatCen
Mar – May 2020	Ongoing delivery interviews Business as usual interviews	NatCen
Jun – Jul 2020	Endline assessments Practitioner survey Cost data collection	NatCen
Jul – Nov 2020	Analysis and reporting	NatCen
Nov 2020	First draft of the report submitted to the EEF	NatCen
Spring 2022	**TO BE DISCUSSED AND POTENTIALLY COMMISSIONED SEPARATELY:** Addendum report on EYFS attainment: Spring 2022	NatCen

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Appendix: Intervention logic model

Learning Language and Loving It ™ - The Hanen Program® for Early Childhood Educators
Logic Model

Inputs	Activities	Outputs	Outcomes	Impacts

Outcomes

SHORT-TERM	MEDIUM-TERM	LONG-TERM
From first session	Immediate/throughout programme	Within academic year/1 year later

Inputs

Funding

Materials - Leaders Guide, posters, participant guide, handouts and worksheets, presentation slides and videos, recruitment materials, website

Personnel – 7-13 Licensed LLLI Program Leaders, Communicate SLT CIC

Activities

Engage local authorities

Recruit settings and promotion

Information events for nursery leads and practitioners

Selection of settings and setting staff

Orientation meeting

Access to resources, including social media forum

Pre-video and workshop assignment

8x2.5 hr group workshops

Post-video

6x video feedback sessions and feedback forms

Program Leaders support

Informal cascading of learning

Support for Program Leaders
- Zoom sessions
- QA visits
- peer support

Outputs

c.70 nurseries and c.140 practitioners have participated in LLLI and received certification

c. 70 nursery leads have attended information / orientation events (or received information)

c. 1,400 children interact with trained practitioners

Outcomes

Increased awareness, knowledge and use of strategies

Increased confidence to implement and review strategies

More reflective on own practice

Change in perceptions, attitudes, values, beliefs regarding child-centred approach

Increased awareness and identification of children's conversational style

Settings support practitioner to implement

LLLI child centred strategies implemented

More responsive and individualised teaching / communication

Improved teacher-child relationship

Practitioners become advocates

Increase in peer feedback among practitioners

Practitioners engage with LLLI community

Local authority and settings support and promote LLLI

Increased **quality** and **quantity** of interactions – with teachers and peers

Increased turn-taking and child initiated interactions

Increased length of utterances

Increased receptive vocabulary

Increased expressive vocabulary

Increased listening, attention and learning

Improved pre-reading skills, e.g. letter knowledge, sound awareness

Improved verbal reasoning, oral language, grammar

Increased social skills

Increased cognitive development

Improved reading, comprehension and writing

Improved behaviour and relationships

Improved Communication

Increased school readiness

Raised attainment

Better social & emotional wellbeing

UNINTENDED CONSEQUENCES for children and practitioners

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