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# Conducting research in real world settings—lessons learned from an implementation and process evaluation of Headsprout Early Reading® in special schools

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**Background:** Evaluating the success of randomised controlled trials (RCTs) requires an understanding of the processes and experiences of those involved in implementation as much as an analysis of outcomes, particularly when conducted in real world settings. This implementation and process evaluation (IPE) explores the experiences of pupils and staff from special schools in England participating in an RCT examining whether Headsprout Early Reading® (HER®), an established on-line reading intervention shown to be effective at teaching early reading skills to pupils in mainstream schools, with additional support strategies and supervision, could be delivered successfully by school staff to pupils with intellectual disabilities.

**Methods:** The study used an embedded mixed methods approach within a RCT design, the results of which are reported elsewhere. It is the first study to include interviews with pupils with intellectual disabilities. With 55 schools (382 pupils in Key Stages 1 and 2) successfully recruited, it is also possibly the largest study of its kind to be conducted to date in special schools.

**Results:** It was not possible for staff in the context at the time of the study (extreme pressures on staffing, meeting individual pupil needs, and pupil and staff absence, compounded by COVID-19) to comply with implementation and to deliver HER® to pupils with fidelity or to the dosage expected.

**Conclusion:** Despite implementation challenges, the study demonstrated an appetite among special schools to be included in research to find effective ways of teaching key skills to pupils with intellectual disabilities.

## KEYWORDS

reading skills, compliance, fidelity, facilitators and barriers to implementation, special schools

## 1 Background

The Department for Education Reading Framework (2023) requires state maintained schools in England to teach phonics to all pupils from Year one (the first year of compulsory schooling for pupils aged five). This includes children with special educational needs and/or disabilities (SEND). Yet much research to date on reading instruction for pupils with SEND uses sight word instruction rather than teaching individual letter/sound components and decoding skills (phonics instruction). While sight reading strategies may be effective at teaching individual targeted words, studies suggest that many pupils with SEND fail to generalize these skills and to develop functional reading skills (Dessementot et al., 2019; Reichow et al., 2019). Roberts-Tyler et al. (2019) also highlight a paucity of research around effective and systematic ways of teaching reading to pupils with SEND.

Headsprout Early Reading<sup>®</sup> (HER<sup>®</sup>) a computer-based, targeted reading intervention using phonics instruction, brings together an understanding of effective instructional processes such as direct instruction (Schieffer et al., 2002; Kinder et al., 2005) along with the use of technology to engage learners and teach early reading skills (Layng et al., 2003). Delivered in 100 episodes, HER<sup>®</sup> works at the pace of the learner, adapting to individual responses, providing additional instruction or practice, and high levels of response and feedback.

Randomised control studies (RCT) evaluating HER<sup>®</sup> with children aged 4–7 years in mainstream schools (Tyler et al., 2015a; Huffstetter et al., 2010; Twyman et al., 2011) found those receiving HER<sup>®</sup> made more progress in reading than those receiving teaching as usual, with small to large effect sizes, where reported, across most measures of reading outcomes (Tyler et al., 2015a).

Similar results have recently been found in studies in England and Wales where HER<sup>®</sup> has been delivered to pupils with intellectual disabilities and/or autism (Grindle et al., 2021; Grindle et al., 2013; Tyler et al., 2015b; Roberts-Tyler et al., 2019). In these small pilot studies, however, additional support strategies set out in an accompanying support manual specifically targeting additional needs were included, and HER<sup>®</sup> was either delivered, or supported by, a team of trained researchers.

The Headsprout Early Reading<sup>®</sup> in Special Schools (HERiSS) project aimed to evaluate whether, using those additional support strategies, it is possible to deliver HER<sup>®</sup> to pupils with intellectual disabilities in special schools at a larger scale, within the weekly curriculum and by special school staff rather than researchers. This was one of the first large-scale cluster RCTs to explore the effects of phonics instruction on the reading skills of Key Stage 1 (KS1) and Key Stage 2 (KS2) pupils with intellectual disabilities (pupils between five and 11 years old) in special schools in England. The trial found no difference in the reading skills at follow-up of pupils in special schools delivering the intervention and schools delivering reading education as usual. A full description of the trial intervention and effectiveness findings are provided in the main quantitative outcomes paper (Flynn et al., 2024; Trial Registration: ISRCTN 46208295).

Evaluating the success of any study conducted in real world settings requires an understanding of the processes and experiences of those involved in implementation as much as the analysis of primary intervention outcomes. While intervention outcomes may serve as indicators of an intervention's effectiveness (Proctor et al., 2011) other factors such as the extent to which it was possible to

implement the intervention as planned are equally important. Implementation measures such as compliance and fidelity, the acceptability of the research design, facilitators and barriers to implementation and the perceptions of those involved, can help explain why outcomes have or have not been achieved, as well as provide valuable information that can be used to inform future research. Implementation research in the field of education (Ryan et al., 2024) and in particular special education (Bond et al., 2024) has, to date been limited. In their recent systematic review Ryan et al. (2024) highlight the importance of considering factors beyond fidelity including the range of contexts that might be involved in implementation, barriers and facilitators and specific implementation measures other than the primary intervention outcome. Bond et al. (2024) stress the importance of the wider school system, having an intervention “champion” and the value of external support throughout the intervention. Implementation and Process Evaluation (IPE) should, therefore, be considered in the planning phase of any intervention study (Schultes, 2023). In studies of educational approaches, which can involve several stakeholders, Mowbray et al. (2003) suggest that IPEs use multiple data sources and that triangulation of these gives evaluators a more comprehensive understanding of the efficacy of an intervention (Schultes et al., 2015).

Using a mixed methods approach and multiple data sources, including interviewing pupils with intellectual disabilities using adapted methods, this IPE explores the experiences of special schools involved in the implementation of the HERiSS study. It is the first such study to ask KS1 and KS2 pupils with intellectual disabilities attending special schools in England about their experiences of a research based intervention.

## 2 Methods

Full methods of the RCT are detailed in the published protocol and in the evaluation report both available on the Education Endowment Foundation (EEF, 2021) website. This description focuses on the IPE.

### 2.1 Study design

The study used a mixed methods approach based on the EEF IPE guidance for evaluators (EEF, 2022) for an embedded IPE within a two-arm parallel cluster randomised controlled trial design. The IPE was informed by data about the fidelity to, and compliance with, the intervention; the experience and perceptions of pupils, teachers and teaching assistants (TAs), and Implementation Support Officers (ISOs) responsible for monitoring and advising schools on effective implementation through remote and in-person visits; an understanding of education as usual (EAU); and information pertaining to school and pupil recruitment and retention.

### 2.2 Study population and setting

Special schools (between 15 and 301 pupils in size) in England which focus on supporting pupils with intellectual disabilities, were eligible for the study if they had at least five and up to 15 pupils at KS1

and/or KS2 who were identified by school teaching staff as lacking early reading skills and met clearly described pupil eligibility criteria: did not have a reading ability beyond the level of HER<sup>®</sup> (as determined by a short passage); could sit at a computer for up to 10 min, understand and follow one or two-step instructions, imitate spoken sounds/words, respond to feedback, and use some self-initiated speech (in English). Pupils with severe visual impairments with no opportunity for correction were excluded because HER<sup>®</sup> does not provide adaptations for the visually impaired.

Fifty-five schools (382 pupils) were recruited and randomised with 27 schools (181 pupils) allocated to the implementation arm following baseline data collection.

Nine pupils from six different schools took part in interviews to share their views on HER<sup>®</sup> (for recruitment see below). All had a range of identified needs including autism; speech, language, and communication needs; severe learning (intellectual) difficulties; mental health needs; and physical disabilities.

Thirteen participants, five teachers and eight TAs, from 12 schools took part in semi-structured interviews asking about their experiences of participating in the HERiSS project and of the HER<sup>®</sup> intervention. All but one had a career background in special education, and all had worked for at least 1 year in the setting (the average was 7 years and ranged from 14 years to just over 1 year). All participants were involved in supporting literacy, seven across the whole school and six focused on their class. One participant was the literacy lead for the school. The number of pupils each participant supported through HER<sup>®</sup> ranged from 1 to 10.

All five ISOs took part in the ISO interviews. ISOs supported an average of six schools each, ranging from nine to two. One participant had an overarching role supporting the other ISOs as well as being responsible for two schools. Four of the five ISOs were involved in HERiSS at the start of the academic year 21/22. One ISO joined the team in January 2022 to focus on two schools that had not, at that stage, engaged with the intervention.

Fifty-five teachers/TAs across the schools completed the pre-intervention EAU survey between April and June 2021. Forty-two members of staff completed the post-intervention EAU survey between May and August 2022.

## 2.3 The HERiSS project

HERiSS included an established on-line reading programme, HER<sup>®</sup> (the intervention); an accompanying support manual detailing supplementary support strategies tailored for pupils with additional needs; training for school staff involved in the delivery of HER<sup>®</sup>, and fortnightly supervision from an ISO for the duration of intervention delivery.

HER<sup>®</sup> utilises adaptive instructional technology to teach phonemic awareness, print awareness, phonics, sounding out, segmenting, and blending. It includes 100 computer-delivered lessons and, depending on individual pupils and their needs, sessions typically take between 10 and 30 min. Schools were asked to schedule HER<sup>®</sup> sessions three times a week with each pupil.

The implementation support manual, specifically designed for using HER<sup>®</sup> with children with additional needs, provides support for high quality implementation such as suggestions for additional activities where pupils are having difficulty with attending, motivation,

or specific concepts (e.g., negation), and included suggestions for additional 1:1 fluency exercises.

The initial training for school staff included digital training resources (seven core and five additional support videos recorded on YouTube) for staff to work through in their own time (approximately 3–4 h), followed by two online and interactive workshops which followed up on key aspects of intervention delivery. Each of these workshops were approximately 2 h. *Ad hoc* training was provided to schools where identified staff were ill and missed the main training delivery or where there was a change in staff. All members of staff involved in the delivery of HER<sup>®</sup> were expected to engage with the digital training resources and at least one member of staff per school was expected to attend the two webinars.

Ongoing implementation support was provided fortnightly by five ISOs via a combination of in-person (when possible) and on-line/telephone support. ISOs received training in both HER<sup>®</sup> delivery and effective implementation support for HER<sup>®</sup>. Support provided by ISOs included supervision (including in-situ observation, and where appropriate working with a pupil to demonstrate suggested supplementary activities) and feedback for school staff, effective use of additional strategies in response to implementation challenges, and the close monitoring of pupil progress using online software data (captured by HER<sup>®</sup> on a pupil-by-pupil basis) providing timely feedback to schools in respect of this.

## 2.4 Procedure

Ethical approval for the study was granted in December 2019 by the Warwick University Humanities and Social Sciences Research Ethics Committee (HSSREC 37/19–20). Recruitment of special schools across England began in December 2019 and was paused in March 2020 (phase 1) because of the COVID-19 pandemic. Recruitment resumed in October 2020 and continued to the end of May 2021 (phase 2). Eligible schools were sent information about the project directly and invited to participate, via email in the first instance. Three hundred and eight schools were initially targeted in a defined geographic region (North West England and West Midlands) for pragmatic reasons—to facilitate planned in-situ data collection and the in-situ support provided by ISOs during the intervention.

Schools expressing an interest received a follow-up telephone call to further explain the project, and were sent a pupil eligibility screening form, school information sheet and privacy notice, and the Memorandum of Understanding (MOU). Both the pupil eligibility screening form and the school information sheet specified the pupil selection criteria: pupils who did not have a reading ability beyond the level of HER<sup>®</sup> (assessed using a short paragraph of text taken from the HER<sup>®</sup> programme to determine whether pupils had a sufficiently low level of decoding skills) and could sit at a computer for up to 10 min; understand and follow one or two-step instructions, imitate spoken sounds/words, respond to feedback (praise or correction), and use some self-initiated speech (in English) (single words to short sentences). Schools were responsible for selecting pupils. The MOU included permission to access data gathered by HER<sup>®</sup>, consent to be randomised and commit to the outcome (intervention or control), allowing time and space for data collection and ensuring three staff could attend training and deliver HER<sup>®</sup>. The

MOU also aimed to ensure that schools in the control group did not purchase and implement HER<sup>®</sup> during the school year, and that schools in the intervention group allocated the resources and commitment needed for implementation with fidelity. By the end of phase 1, 47 schools had returned a signed MOU, and there were 19 MOUs under review.

Based on the lessons learned from phase 1, phase 2 began with a postal and email communication to headteachers, and literacy leads of all schools initially targeted who had not signed up in phase 1. This was followed up with a telephone call within a few days. Additional schools across England were also contacted. These geographic extensions were facilitated by the decision for the pre and post-test data collection to be conducted remotely because of the on-going COVID-19 pandemic, thus not requiring the assessors to be travelling to schools and allowing for a portion of ISO supervision to be conducted remotely. The combined total of schools contacted over Phases 1 and 2 was 365.

Following schools returning the signed MOU, identifying eligible pupils, obtaining parental consent for those pupils to take part, and providing pupil information (primary need, eligibility for school meals, English as a first language), baseline data collection (May to July 2021) was completed, and schools were sent the EAU survey. Data collection was conducted remotely via Microsoft Teams with each pupil supported by a member of school staff. Although parental consent had been obtained, pupil assent was also sought before starting the assessments. Once all participating pupils in a school had completed the baseline data collection, the school was allocated to the intervention or control groups (1:1 allocation). Full details of both the process for obtaining assent and the randomisation process and primary outcome analyses are detailed elsewhere (Flynn et al., 2025; Flynn et al., 2024).

Those schools allocated to the HER<sup>®</sup> arm implemented HER<sup>®</sup> across one school year, post randomisation, and at least 3 members of staff attended the training. The intention was that HER<sup>®</sup> would replace EAU within the intervention schools, only for those pupils taking part. However, this was not explicit in the MOU, it was not monitored by the ISOs and while no data were collected in respect of this it was evident in the interview data that some pupils receiving HER<sup>®</sup> also received EAU. Those schools in the education as usual (control) group continued to offer reading instruction as usual. To facilitate retention, control group schools received two payments: £250 on completion of baseline data collection, and £750 on completion of post intervention data collection. Post-intervention data collection was carried out from May to July 2022. Researchers collecting both baseline and post-intervention data were blind to schools'/pupils' allocation during data collection.

All intervention schools, including those that had not engaged with the intervention, were invited to take part in semi-structured interviews for pupils and teachers/TAs once they had completed the post intervention data collection. Informed consent for pupils to take part in the interviews was provided by pupils' primary carers, with information and consent forms being sent out and collected by the pupils' schools. Schools scheduled times for the pupil interviews. Interviews were conducted online by the sixth author using technology provided by Zoom Video Communications Inc. (Zoom) (this platform better facilitated the procedure for the pupil interviews) with individual pupils, plus a member of school staff to support the pupil and to set up the call.

For teacher and TA interviews, informed consent was obtained from participants. Interviews were conducted by the first author using Microsoft Teams.

All five ISOs were also invited to take part in a semi-structured interview conducted also using Microsoft Teams. Informed consent was obtained, and interviews were conducted by the first author.

## 2.5 IPE measures

### 2.5.1 Compliance data

Compliance data were collected by the delivery team (data in respect of attending training) and by ISOs as part of their scheduled visits. Compliance included six components: digital training completed by all teachers/TAs supporting the delivery of HER<sup>®</sup>; at least one member of staff attending the two webinars; at least two trained members of staff overseeing implementation to the end of the academic year; schools engaging with ISO provided fortnightly supervision and with monthly ISO visits in schools; staff following recommendations from ISO sessions including using the activities outlined in the HER<sup>®</sup> manual; and time-tabling 3 HER<sup>®</sup> sessions per pupil per week.

Full compliance was defined as meeting all six components; partial as meeting at least two out of the first three components and at least one of the last two; or meeting four of the first five components.

### 2.5.2 Fidelity and dosage data

Fidelity and dosage data were gathered directly from HER<sup>®</sup> which collects data at pupil level including logins, episode accuracy scores, frequency of episodes, use of benchmarks, and benchmark scores. High fidelity was defined as evidence of at least 80% fidelity for repeating episodes when required and completing and responding appropriately to benchmark assessments. Target dosage was defined as completing three sessions of HER<sup>®</sup> per week per pupil.

### 2.5.3 Education as usual

Education as usual was measured using a pre- and post-intervention EAU survey. The survey was distributed using Qualtrics (Qualtrics, Provo, UT) and included questions about education as usual for literacy in the school before and during the intervention period such as standard literacy activities, use of phonics interventions, school IT facilities and expertise, usual use of IT for teaching pupils, and the impact of the COVID-19 pandemic.

### 2.5.4 School and pupil recruitment and retention data

School and pupil recruitment and retention data were recorded including how many schools were approached, how many were recruited, school and pupil retention figures at all stages, and reasons for attrition (if given).

### 2.5.5 Semi-structured interview data

Semi-structured interview data were gathered from pupils who received HER<sup>®</sup>, teachers and TAs from schools in the intervention group, and all ISOs. Pupil interviews were conducted using Talking Mats<sup>™</sup>, a symbol-based communication tool developed to support people with communication needs including children with SEND (Bradshaw et al., 2018; Germain, 2004). The overall question for the

Talking Mats interviews was: “How do you feel about Headsprout?” Pupils were asked open questions about how they felt about different components of the intervention, represented by various option symbols. Pupils placed these option symbols under one of three option symbols: “Like,” “Not sure,” and “Do not like.” Pupils were encouraged to share extra information verbally and non-verbally.

The interview schedule for teachers/TAs included topics such as attitudes/perceptions of delivering HER<sup>®</sup>, barriers and facilitators to delivering HER<sup>®</sup>, any unexpected consequences for pupils taking part in HERiSS, perceptions of how pupils experienced HER<sup>®</sup>, perceptions of the training and subsequent support provided (by ISOs and by school leadership), the usefulness of the HER<sup>®</sup> manual and confidence in teaching children with SEND to read and more generally. In addition, the interviews explored COVID-19 pandemic-related challenges. Teachers were also asked about any impact of the DfE phonics policy changes, which was in effect from the start of the 2021/22 school year. The invitations to participate asked schools to prioritise where possible the most senior, or experienced, teacher involved in making decisions, and those involved in the direct implementation of HER<sup>®</sup>. Decision makers were, in addition, asked about the decision-making process to take part in the HERiSS project including what motivated them to take part, challenges that arose and reflections of taking part in a RCT.

The interview schedule for ISOs was also developed by the evaluation team in discussion with the intervention delivery team and included topics such as ISO perceptions of the facilitators and barriers to implementation in special school settings, attitudes/perceptions of schools’ engagement with additional support provided (the HER<sup>®</sup> manual and ISO recommendations) and support provided by school leadership.

Data collection instruments are available on request from the authors.

## 2.6 IPE data analyses

Individual data sources were analysed as outlined below.

Fidelity and dosage data, compliance data, and recruitment and retention log data were analysed descriptively.

### 2.6.1 Pupil interview data

The Talking Mats<sup>™</sup> interview audios were transcribed, videos were reviewed, and observation descriptions were added to the transcripts. The Talking Mats<sup>™</sup> Effectiveness Framework of Functional Communication (EEFC) was administered to each pupil’s interview. The EEFC is used to determine whether each Talking Mats<sup>™</sup> is an example of “effective communication” based on several observable indicators (developed by [Talking Mats Limited, 2014](#); [Murphy et al., 2010](#)). These observable indicators include seven items including: “Engagement”; “Participant’s understanding of issue for discussion”; “Interviewer’s understanding of participant’s views”; “Participant—on track”; “Symmetry”; “Real time”; and “Interviewer’s satisfaction.” These items were measured on a five-point scale from four to zero: “Always” (4); “Often” (3); “50/50” (2); “Occasionally” (1); and “Never/none” (0). These items were summed to produce a score out of 28, with a score of at least 75%, or 21, indicating effective communication. Pupils whose Talking Mats<sup>™</sup> scored under 21 on the EEFC were reviewed by a second researcher, and if agreed between both researchers, removed from the analysis.

Pupils’ Talking Mats<sup>™</sup> data were first analysed quantitatively, with the most frequently endorsed symbols identified by calculating mean scores for each symbol. Mean symbol scores were calculated by allocating the following scores to each top scale item: “Like” = 2; “Not sure” = 1; “Do not like” = 0. The responses from participants for each option symbol were summed and then divided by the number of participants, with possible scores ranging from 0–2. Higher scores indicated more positive feelings towards that specific option symbol. Responses were also summed to quantitatively summarise how pupils felt about HER<sup>®</sup> overall. The transcriptions with observation descriptions were then analysed using content analysis ([Hsieh and Shannon, 2005](#)). As the amount of verbal data provided by pupils was minimal, this analysis remained descriptive and so is presented symbol-by-symbol.

### 2.6.2 Teacher and TA interview data and ISO interview data

Teacher and TA interview data and ISO interview data were transcribed verbatim. Analysis was predominantly deductive with transcripts examined for prespecified themes based on the study research questions, but with the flexibility of adding additional themes that were apparent across the data set and added depth to the understanding of schools’ experience of HERiSS and HER<sup>®</sup>. A master theme table was produced. A second researcher independently analysed 20% of the transcripts (three teacher and TA interviews and one ISO interview) and the findings were discussed collaboratively. There was agreement across all the prespecified themes. All additional themes that were identified by the second researcher had been captured in the master theme table. Once the independent review was complete, the Master Theme table was synthesised, and a thematic map was produced for both teacher and TA interview data and ISO interview data. The synthesis and thematic maps were once again reviewed and validated by the second researcher.

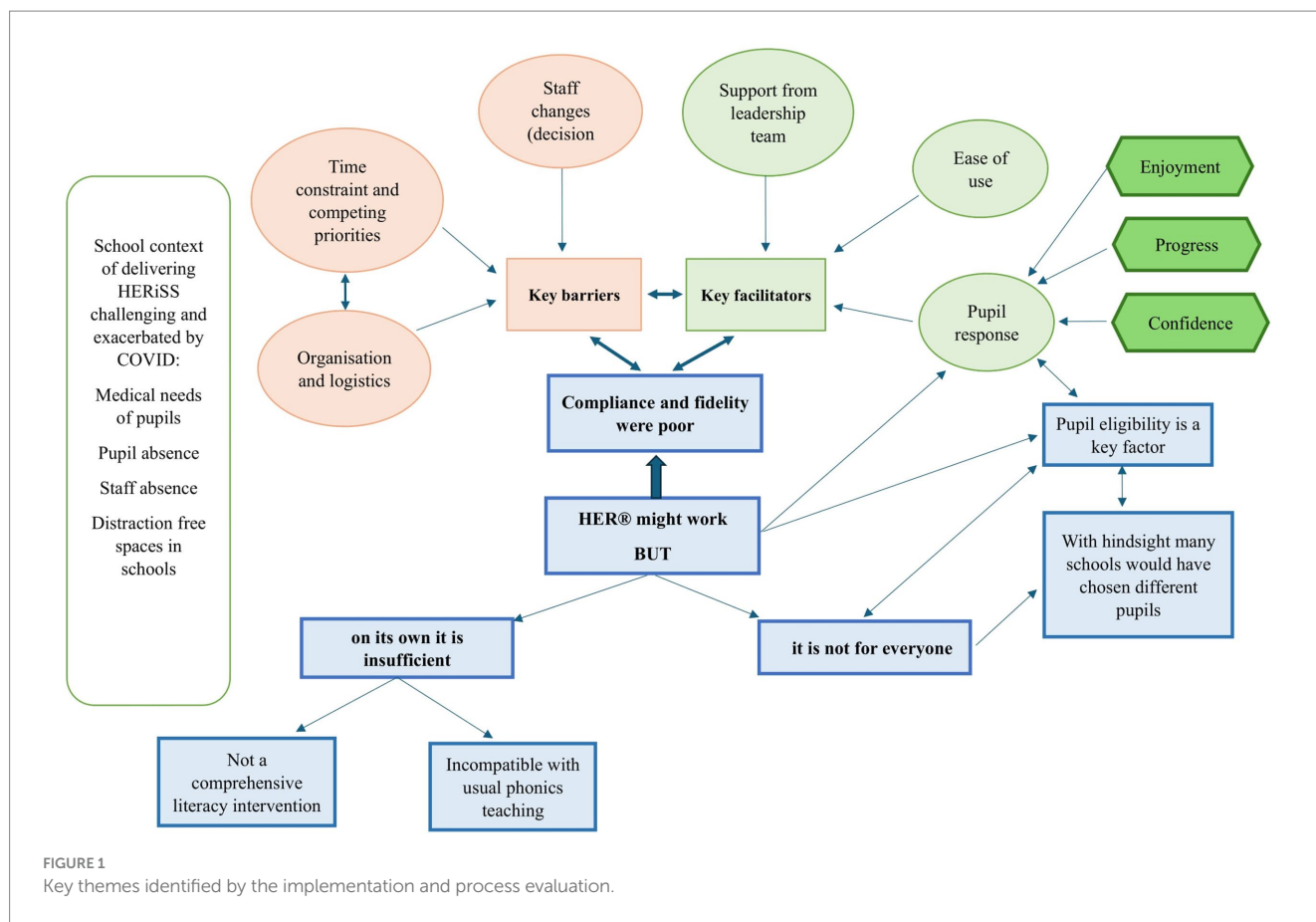
### 2.6.3 Teacher and TA interview data and ISO interview data

Pre- and post-intervention education as usual survey data were analysed descriptively. Interventions that schools were using were coded to reflect the key characteristics of HER<sup>®</sup> so that differences between HER<sup>®</sup> and TAU could be analysed: adapted for SEND, phonics, sequential learning, one to one instruction, increased learning opportunities, and repetition.

## 2.7 Data synthesis

For the analysis a triangulation protocol as outlined by was used to integrate the respective data sources. This method of analysis was chosen because of the inter-related nature of the data sources, and because the triangulation process facilitates the validity of findings by assessing the extent to which different data sources agree with or contradict findings from other sources.

A triangulation matrix was developed tabulating key findings across all data sources. All instances of convergence (complete agreement), complementarity (where data sources complemented each other), and dissonance (contradiction) were highlighted. The matrix was reviewed and agreed by the research and used to interpret the overall findings of the IPE.



### 3 Results and discussion

#### 3.1 Key themes

Of the 27 schools and 181 pupils randomised to the implementation arm after baseline data collection, one school (9 pupils) withdrew before the start of the academic year 2021/22 citing staffing and resources issues and four schools (67 pupils) did not engage with the intervention.

For the 22 special schools that did take part in the intervention, it was not possible in the environment at the time to deliver HER<sup>®</sup> as planned. This was not through a lack of willingness on the part of school staff. Rather it reflected an already challenging environment exacerbated by the COVID-19 pandemic. The acceptability of research and its design can sometimes be a barrier to implementation. This was not the case with those school staff involved in the HERiSS project that took part in the interviews, although it may have played a part for the four schools that did not engage with the intervention. All staff interviewed spoke of their excitement of taking part in research and the opportunity to contribute to evidence-based practice, with many highlighting the lack of research around teaching pupils with intellectual disabilities to read among the reasons for signing up to the HERiSS project.

*“I think it’s quite exciting to be there in the front line of a research that’s going on .....especially in special schools, you know there’s, I do*

*not know how much research goes on, but yeah it’s quite exciting”* (Teacher, Jayden).<sup>1</sup>

Teachers/TAs and ISOs were equally unanimous about their willingness to use HER<sup>®</sup> in the future despite the acknowledgement that it had not been implemented as planned. All Teachers/TAs spoke of their frustration with the barriers to implementation brought about by the context within which they were working; for three an added sense of individual responsibility led to a sense of a wasted opportunity, a feeling echoed by three ISOs:

*“due to not having your full team, meant that I did not deliver this program to the best of my ability”* (TA, Hari).

*“it’s frustrating because I think some of these children really would have really flown on the program, and they are just not getting the opportunity to”* (ISO, Rachel).

Figure 1 illustrates the key themes identified in the IPE, and the relationships between them: (1) Both compliance with the HERiSS project and fidelity for HER<sup>®</sup> were poor; (2) the context within which HER<sup>®</sup> was delivered including the COVID-19 pandemic and associated restrictions, logistics, time constraints, competing priorities, and staff turnover including key decision makers, presented significant

<sup>1</sup> Names have been pseudonymised.

barriers to implementation; (3) pupil response, ease of use of HER<sup>®</sup>, support from the senior leadership team and good organisation were key facilitators; (4) School staff liked HER<sup>®</sup> and thought it could be a useful resource but, (a) on its own it was perceived as insufficient, and (b) it was perceived as not suitable for everyone.

### 3.2 Compliance and fidelity

Compliance with the HERiSS project delivery elements (including dosage) and fidelity of HER<sup>®</sup> were poor (Table 1). Six out of 26 schools (23%) were fully compliant, and 10 schools did not comply with any components. Training (see below) was a key component of compliance, and it is possible that the low fidelity scores reflect schools' lack of understanding of what was expected of them. Full details of the compliance data are reported elsewhere (Flynn et al., 2024).

#### 3.2.1 Timetabling three sessions per week per pupil (dosage)

Only six schools timetabled three HER<sup>®</sup> sessions per pupil per week. However, timetabling sessions did not necessarily result in intervention delivery. The mean number of actual logins to the HER<sup>®</sup> intervention per pupil per week was 1.4 ranging from 0.21 to 5.7. Only three pupils across all schools were logged in for a mean of three or more times per week. The result of this is that only two pupils completed the intervention to episode 100 but only one of these two achieved episode 100 to criterion. Forty-five pupils did not get past episode 9. Figure 2 shows the numbers of pupils and the episodes achieved to criterion in groups of 10.

#### 3.2.2 Training

It was evident from one teacher/TA interview and one ISO interview that the requirement that all staff members had to have completed the training to deliver HER<sup>®</sup> had not been met. It was also evident that teachers/TAs were unclear about needing to have completed the digital training materials before attending the webinars. Those who attended webinars without having first attempted to log onto HER<sup>®</sup> (instructions given in the digital resources) found the content of sessions difficult to follow. Seven teachers/TAs and four ISOs commented that the amount of information that was covered in the materials was too much for the window of time allocated and was “overwhelming.” This was not helped by the fact that training materials were received at the busiest time of year for schools—the start of the academic year.

Despite these findings, interviewees were complimentary about the quality of the training which was described as “helpful,” “really good,” and “thorough.” It was acknowledged that having access to the digital resources throughout the year was helpful and six participants observed that once they were familiar with the intervention the training made sense.

#### 3.2.3 Engagement with ISO support and recommendations and use of the accompanying support manual

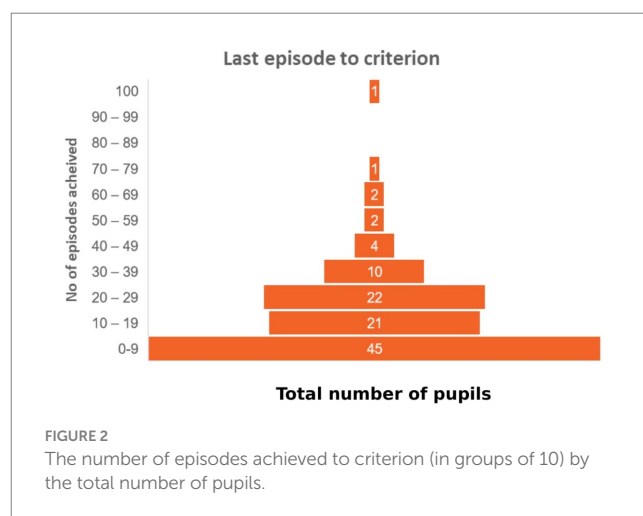
All but one teacher/TA were similarly enthusiastic about the ISO support received describing it as “helpful,” “professional” and “knowledgeable.” A recurring theme throughout the interviews was an appreciation of any support or resource received that provided hands-on, concrete support without the need for extra work on the part of school staff—not surprising given the challenging environment. Seven

TABLE 1 Compliance and fidelity measures.

Compliance measures	
1. Completing digital training	
2. Attending training webinars	
3. Trained staff involved in delivery	
4. Engagement with ISO sessions	
5. Following ISO suggestions and use of manual	
6. Timetabling 3 HER <sup>®</sup> sessions per pupil per week (dosage)	

Degree of compliance	No. of schools
Full (all six components)	6
Partial (a) only (2 out of components 1–3; and 1 out of components 4 and 5)	0
Partial (b) only (4 out of components 1–5)	9
Partial (a) and Partial (b)	2
No compliance	10

Degree of fidelity	No. of pupils (%)
Episodes repeated where appropriate	23 (30% of applicable cases)
Benchmark assessments completed where appropriate	25 (39%)
No benchmark assessments completed despite being required	22 (34%)



teachers/TAs also praised the accompanying support manual citing the lack of needing themselves to make further adaptations as particularly helpful. ISOs reported that the in-situ visits seemed to be the most helpful because of their hands-on nature and, while the difference between in-situ and remote visits was not commented on by school staff, four said that they would have liked more ISO visits:

“She was always available for, if I needed to ask something, clarify something that I wasn’t sure, then she was always available on email which was great” (Teacher, Debbie).

“So she was very, very good, with responding to email, and even when she came into school she was very good with pointers and stuff like that for me” (TA, Hari).

ISOs also noted an appreciation of tangible support:

*“she actually commented to me “I’ve never had so much help and support, you know, this is unprecedented this never happens, with other people coming in, you only see them once every 6 months or whatever if that, once a year, you know, so this level of support is great””* (ISO, Savi).

And gave evidence of teachers/TAs following up on practical suggestions.

However, ISOs reported difficulties around engagement. Reasons cited included difficulties getting hold of the right person to organise visits in the first place, teachers/TAs finding the time to meet with them, and a lack of follow through on some of the suggestions made. For instance, three ISOs spoke of a reluctance on the part of some schools to adopt the reward systems included in HER<sup>®</sup> in addition to any reward systems being used in the classroom. Interestingly all pupils who responded to the “collecting stars” symbol (part of the motivation system in HER<sup>®</sup>) in the Talking Mats<sup>™</sup> interviews said that this was the aspect they liked the most. There were also contradictory data around the use of the support manual with one ISO citing no evidence of its use in the schools that they supported and another two commenting that the school’s manual had been “lost” or “locked away.”

ISOs acknowledged that most of the difficulties encountered were a result of the challenges that schools were facing especially relating to the COVID-19 pandemic. This, in turn, put them in a difficult and sometimes conflicted position. Their role was to help ensure that the intervention was delivered as planned but they also wanted to be as supportive as possible and to help schools succeed:

*“I sometimes almost sort of felt pulled in two directions because you are trying to do a good job for the research team on one hand and make sure the schools were doing a good job but equally sometimes I found myself feeling like I wasn’t doing that because sometimes I felt like to keep the schools on my side”* (ISO, Penny).

### 3.3 Barriers to implementation

The context within which HERiSS was delivered was challenging and posed significant barriers to implementation. These included logistics and staffing, time constraints, competing priorities, and staff turnover including key decision makers, all of which were compounded by the COVID-19 pandemic. In addition, some schools highlighted pupil selection as a barrier.

Special schools cater for pupils with a range of different needs. When asked about their attitudes to teaching pupils with intellectual disabilities to read teachers/TAs were positive but noted that it was not easy. Some pupils require one-to-one or small group teaching and assistance. Teaching often needs to be differentiated, with both materials and delivery adapted or sometimes made to suit individual needs.

*“It’s difficult because they are all so different”* (TA, Geeta).

The EAU survey highlighted the lack of reading interventions designed for children in special schools. Other than some interventions for pupils with Down syndrome, one for dyslexia, and one for visually impaired pupils, most schools reported having to use

more than one reading intervention to meet pupil needs but noted that interventions designed for mainstream schools in literacy sessions such as Read Write Inc. and Bug Club need to be “heavily adapted.”

Pupil absence was frequent, and many had co-occurring health needs requiring staff with expertise in delegated healthcare to be readily accessible. Five teachers/TAs noted that organising staffing around these issues is difficult at the best of times, without the added complication of implementing HER<sup>®</sup> which required access to information technology equipment, and the internet, in distraction free spaces, with teacher support at the right time of day for each pupil involved. ISOs also cited finding spaces in schools that were distraction free as a problem.

*“The other thing that we had in our school as well is there’s not a lot of quiet spaces, so there wasn’t really anywhere to go to deliver it very quietly, where also the internet would work and everything else”* (Teacher, Fatima).

*“I do have pupils in my class that are one-to-one, where so logistically, it was quite hard on the staffing to be able to find that time to go”* (Teacher, Lana).

The COVID-19 pandemic compounded these difficulties. Early on, the need to sanitise equipment added to staff tasks, and the requirement imposed by the UK government to keep staff and pupils in “bubbles” (small groups to minimise the risk of spreading the virus) further restricted the use of space. The COVID-19 pandemic also led to increased staff and pupil absences which had a direct impact on implementation:

*“because we have had a lot of staff absences I’ve been having to go and cover in classes, which is then taking me away from the intervention ... I just were not getting as much, no way near as many sessions as I would have liked to”* (TA, Ali).

*“the reason why they were not able to complete the 3 sessions a week, or sometimes even any sessions because they just did not have the staff to be able to do it, the same with pupil absence as well”* (ISO, Penny).

Staffing issues and the additional tasks brought about by the COVID-19 pandemic led to difficulties finding time to fit HER<sup>®</sup> into daily activities as reflected in the compliance data. It was clear, as noted above, that the timing of the training was an issue, but four teachers/TAs cited time pressure as a continued problem throughout the academic year. This in turn led to staff questioning priorities as they had to choose activities to focus on. For some it was a question of whether spending time on HER<sup>®</sup> was right for certain pupils; for others it was the difficulty that allocating resources to HER<sup>®</sup> posed when they also had to deliver other literacy activities such as comprehension, writing, speaking as well as delivering phonics interventions to other pupils. Three teachers/TAs noted that the order in which letter sounds were taught in HER<sup>®</sup> led to them having to do extra work to run catch up sessions with pupils for sounds missed that the rest of the class was working on. This was even though the intention had been that intervention schools did not offer pupils both HER<sup>®</sup> and EAU.

These data were also reflected in the ISO interviews and the EAU survey. Three ISOs spoke of the challenges of implementing phonics interventions as well as HER<sup>®</sup> in terms of the competing priorities and, for some, raising the question of whether HER<sup>®</sup> met the government guidance in respect of phonics introduced at the start of the academic year 2021/22. The EAU survey data showed that while all schools



reported using multiple literacy interventions both pre and post intervention, there was an increased use of phonics post intervention.

*“But also, it meant that the staff had an extra thing to do and they did not sort of conceive of Headsprout as being the reading provision” (ISO, Olivia).*

In addition to listing the tangible challenges that school staff were having to negotiate, the interview data highlight the levels of stress experienced through the language used:

*“With COVID as well it’s been a nightmare” (TA, Michelle).*

In turn, ISOs talked repeatedly about staff being “*over stretched*” and under “*stress*.”

ISOs also highlighted the change of staff experienced by many schools part way through the intervention as a significant barrier to implementation. In some cases, it was the decision maker:

*“so that initial excitement between the literacy lead and deputy head and the recruitment had gone ... the new literacy lead had no idea what was going on” (ISO, Savi).*

In at least four cases, staff changes occurred during implementation. Where replacements were found it is not clear that training (although available) was completed. Two “replacement” teachers/TAs described being “*a little lost*” (TA, Izzy) and “*it sort of got left to me*” (Teacher, Jayden). Many observed that pupils had been chosen for the study by someone no longer at the school (see below).

Some of these barriers are reflected in the study retention data. The trial had a relatively high rate of attrition, particularly from the intervention group. From the 55 schools that were randomised, six schools (63 pupils) in the intervention group and two schools (25 pupils) in the control group were lost to follow up. Where reasons were given at whole school level they included “staffing crisis”; conflict with the school’s literacy intervention; an inability to fit in post-intervention testing before the end of term; and post-tests being too difficult for pupils. A further 20 pupils (i.e., from schools that were not lost to follow-up) were lost across both intervention and control schools for reasons including: moved into KS3, not eligible with hindsight (see below), long term absence/illness, and having left the school.

What was also clear was that despite initial pupil selection criteria having been set, some pupils selected were not suitable for the intervention. Three ISOs highlighted this as a barrier to implementation, noting the impact that it had on staff:

*“I lost one school because they just did not have the faith in it and I think that it was largely because somehow with the eligibility criteria the wrong students had been selected to do it” (ISO, Penny).*

Five teachers/TAs felt that some of the pupils chosen had not have the pre-requisite skills or learning style to benefit from HER®, and eight felt that they had other pupils who may have been more suitable. Although the interview data suggest that this was not because the eligibility criteria were unclear, most observed that familiarity with HER® gave them a better understanding of which pupils were most likely to access and benefit from the intervention. Two instances were cited of the person doing the selection not knowing the pupils very

well. It was also the case in some instances that the pupils on the study were not those initially selected by the school. Substitutions had to be made for a variety of reasons: pupils changing classes, leaving school, or parental consent to take part in the study was not obtained.

### 3.4 Key facilitating factors

Notwithstanding the challenges outlined above, six schools were fully compliant and 11 partially compliant with the intervention. Facilitating factors included pupil positive response, ease of use of the intervention and support from the senior leadership team which led to good organisation.

It was clear from all interviews that most pupils enjoyed HER® and that many, despite not having progressed very far, made progress. For school staff this was motivating. The language used by teachers/TAs reflected their enthusiasm:

*“He loved it. He absolutely loved it ...it really helped him having that fun aspect to it as such” (TA, Hari).*

*“they saw it as a bit of a game, which was really nice, they were just coming out to play on the laptop, which was, you know, great for us, great for them” (Teacher, Kamla).*

Pupils placed 76.64% of the Talking Mats™ symbols under “Like,” 19.18% under “Not sure,” and just 10.96% of symbols placed under “Do not like.” Pupils enjoyed “collecting stars” the most, followed by “The teacher helping me,” “Doing things myself,” “The characters,” “Getting things right,” “The games,” and “The pictures.” Six out of eight enjoyed “Learning words” and “Learning how to read.” One pupil asked if he could carry on with the intervention at home over the summer. The most disliked aspect of the programme was “getting things wrong,” which five pupils placed their symbol on.

Enjoyment translated into progress in early reading skills was noted by 11 teachers/TAs with six also observing an increase in pupil confidence and self-esteem:

*“His mum cried because I recorded a video of him reading the book, and when I showed his mum, she cried, she was like, “I never ever thought my child would read,”” (TA, Hari).*

*“But I see now how proud they feel of themselves, when they are going into a book, and they can read the full book,” (TA, Ali).*

A few examples were given of this progress generalizing to other skills; increased talking/sounding out, increased confidence in asking for help, and one example of improved writing skills were noted along with increased independence and enjoyment from reading.

One of the reasons cited for pupil enthusiasm was that because HER® was computer/tablet based and looked like a game they did not see the intervention as “work.” HER® was also described as very easy to use. For some this meant that pupils were able to use the intervention independently; others appreciated the fact that HER® and the accompanying support manual were comprehensive with no need for adaptations—something as noted above was highlighted in the TAU survey as necessary for most other interventions.

*“and then for us as teachers, we are adapting all the time, we had to do no adaptations, it was there, it was ready, it was accessible,*

*it was, yea you know, it was really easy to deliver ....it was pitched perfectly for our pupils” (Teacher, Kamla).*

Teachers also liked the way that HER<sup>®</sup> works including its responsiveness to the pupil, opportunities for repetition, and how easy it was to follow pupil progress. One observed that HER<sup>®</sup> was particularly helpful for pupils lacking pencil skills as many other interventions ask pupils to “circle” things.

Senior leadership support for HERiSS was another facilitator with six teachers/TAs giving examples of the practical support that made implementation easier: organising staff rotas, providing space, listening to and encouraging pupils to read, having someone co-ordinate the intervention, all of which contributed to good organisation. HERiSS was built into the school improvement plan in one instance and demonstrated during an Ofsted (Office for Standards in Education) inspection in another. ISOs commented that engagement with their sessions were better when the senior leadership were either actively supporting or had put in place the organisational infrastructure to support the intervention.

*“We got into quite a good system to deliver it, but children would get in straight off the bus, they would come down, their iPads would be ready on the table, they’d log themselves in, and we’d almost just float and oversee what was going on” (Teacher, Bella).*

One ISO noted the opposite. In instances with a lack of support from the senior leadership and poor communication, school staff often did not know what was expected of them.

### 3.5 HER<sup>®</sup> liked by teachers and could be a useful resource

Despite the implementation challenges posed by the context within which they were working, and even though neither enjoyment nor progress were experienced by all pupils included in the study, teachers/TAs were enthusiastic about HER<sup>®</sup>.

*“What else was good, it was just a nice program to deliver” (TA, Emma).*

Eight participants commented that they had other pupils who may have benefitted from HER<sup>®</sup>:

*“we brought in some other children, that were not part of the actual assessment” (TA, Chris).*

*“we probably ended up with twenty children” (Teacher, Bella).*

Two teachers/ISOs felt that it had exceeded their expectations and seven that it had met theirs. All said that they would be happy to continue to use HER<sup>®</sup> in the future although, as noted below, 10 teachers/TAs qualified their response.

a HER<sup>®</sup> alone is insufficient as a literacy intervention.

Both teachers and TAs noted that HER<sup>®</sup> could be used as part of the “toolbox” available to support the literacy curriculum but that on its own it is insufficient. This was partly to do with the fact, as noted above, that HER<sup>®</sup> is not a comprehensive literacy intervention; and in part because it does not work easily alongside phonics teaching as usual.

*“I think Headsprout could be very good as a supplementary intervention, but I think they still need, I think our children in particular needed the regular phonics input as well in order to make it work” (TA, Debbie).*

b It is not suitable for everyone - pupil eligibility is a key factor.

It was clear too that HER<sup>®</sup> is not perceived as a resource that can meet all pupils’ needs.

*“I would [use HER<sup>®</sup>] happily, you know with the right pupils” (Teacher, Kamla).*

*“I think it would be quite good to try it. I think for the more able ones I think it would be good” (TA, Michelle).*

Not all pupils taking part in the study made progress. Three teachers/TAs reported mixed progress:

*“For some of them, for one or two of them it was really, really good, and we have seen their reading improve, and not just their reading but their confidence in their own ability to read, and for others that struggled with it more, the impact has been a lot less” (TA, Debbie).*

Teachers/TAs all talked about the differentiated needs of special school pupils not only, as noted above, in relation to the challenges of working within this context but also in respect of trying to find ways of working with individual pupils:

*“we have looked into quite a lot of methods because we have discovered children do not read the same, and one child does not read the same as another child” (Teacher, Bella).*

Their passion for finding resources that work for pupils was clear:

*“I love it, it’s something that you can see when it, when they get it, or suddenly they’ll go, [clicks fingers] lightbulb moment” (TA, Emma).*

*“So yea, it’s very much on a child-to-child basis, and we do not give up, if it’s not working for one year, we do not give up” (Teacher, Kamla).*

### 3.6 Lessons learned

While the teacher/TA interview data are limited with participants drawn from those schools that had engaged with the research and attempted to implement the intervention and the particular context within which the research was conducted— special schools in England during the time of COVID-19 also limits generalisability to other settings, the findings nonetheless provide useful insight into the challenges of working in special schools and may help inform further research in similar schools in other settings.

Going forward, consideration needs to be given to supporting schools around their capacity to commit to delivery and their understanding of what was expected of them. This is the responsibility of both research teams and funders. Allocating resources to deliver that support is key as is getting senior leadership on board and having one person coordinating the intervention. Helping schools understand how

an intervention works prior to having to identify eligible pupils as well as helping them with the process of identifying pupils could help target resources more effectively. Allowing more time for schools to prepare between randomisation and the start of implementation, particularly in respect of training, is also critical. This is difficult if an intervention is planned to run for a full academic year given pressures on all schools at the start of that year so offering flexible training in a variety of formats accessible from the point of randomisation may be helpful.

Future research would also benefit from an exploration of the factors that led schools to decline to take part or to drop out. This had been planned post-intervention, but it was difficult to re-engage with schools so long after initial recruitment. It would be helpful to follow up with schools within a short time frame of their decision.

## 4 Conclusion

HERISS was perhaps the largest RCT to be conducted in special schools in England. As far as we can ascertain, it was the first to include pupils with intellectual disabilities' experiences in its IPE. Special schools welcomed the opportunity to take part in research targeting "their" pupils—a population that is under-represented—and the research design was acceptable (schools were willing to be randomised). It was also possible to obtain informed consent from parents of special school pupils with to take part and to obtain assent from those pupils prior to data collection. However, schools were unable to deliver the intervention as planned, largely because of barriers to implementation related to the context within which they work. The IPE provides an explanation of why the statistical analysis of outcomes showed the intervention to be ineffective and the challenges faced by special schools in England in the current environment. Encouragingly, the IPE also highlights those aspects of the intervention that did "work" and participating special schools demonstrated an appetite to be included in research despite difficulties in implementation.

## Data availability statement

The datasets generated during the current trial are not publicly available but are available from the corresponding author on reasonable request.

## Ethics statement

The studies involving humans were approved by Warwick University Humanities and Social Sciences Research Ethics Committee (HSSREC 37/19–20). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

## Author contributions

LD: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. SF: Conceptualization, Data curation, Formal analysis,

Funding acquisition, Investigation, Project administration, Supervision, Writing – original draft, Writing – review & editing. PT: Data curation, Formal analysis, Writing – original draft, Writing – review & editing. RM: Formal analysis, Funding acquisition, Writing – original draft, Writing – review & editing. ER-T: Project administration, Writing – original draft, Writing – review & editing. RH: Conceptualization, Funding acquisition, Supervision, Writing – original draft, Writing – review & editing. NH: Methodology, Writing – original draft, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

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## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1600643/full#supplementary-material>

## References

- Bond, C., Evans, V., and Humphrey, N. (2024). Implementing targeted social and emotional learning interventions in schools—are more specific models needed? *J. Res. Spec. Educ. Needs* 24, 555–565. doi: 10.1111/1471-3802.12655
- Bradshaw, J., Gore, N., and Darvell, C. (2018). Supporting the direct involvement of students with disabilities in functional assessment through use of talking Mats®. *Tizard Learn. Disabil. Rev.* 23, 111–116. doi: 10.1108/TLDR-01-2018-0004
- Dessementet, R. S., Martinet, C., de Chambrier, A.-F., Martini-Willemin, B.-M., and Audrin, C. (2019). A meta-analysis on the effectiveness of phonics instruction for teaching decoding skills to students with intellectual disability. *Educ. Res. Rev.* 26, 52–70. doi: 10.1016/j.edurev.2019.01.001
- EEF (2021). Phonics: Education Endowment Fund: Teaching and Learning Toolkit. Available at: <https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/phonics>
- EEF (2022). Implementation and process evaluation guidance for EEF evaluations. Available online at: <https://d2tic4wvo1iusb.cloudfront.net/production/documents/evaluation/evaluation-design/EEF-IPE-Guidance-August-2022.pdf?v=1691742985> (Accessed January 31, 2025).
- Flynn, S., Denne, L. D., Manktelow, N., Jones, B., Hayden, N., and Abdi, S. (2025). Engaging children with developmental disabilities in online data collection procedures: reflections and implications for future research. *Tizard Learn. Disabil. Rev.* doi: 10.1108/TLDR-07-2024-0032
- Flynn, S., Thompson, P. A., Denne, L. D., Morris, R., Roberts-Tyler, E., and Hastings, R. P. (2024). Effectiveness of Headsprout Early Reading® in special schools: a cluster randomised controlled trial. Hoboken, NJ: Wiley.
- Germain, R. (2004). An exploratory study using cameras and talking mats to access the views of young people with learning disabilities on their out-of-school activities. *Br. J. Learn. Disabil.* 32, 170–174. doi: 10.1111/j.1468-3156.2004.00317.x
- Grindle, C. F., Hughes, J. C., Saville, M., Huxley, K., and Hastings, R. P. (2013). Teaching early reading skills to children with autism using Mimosprout early reading. *Behav. Interv.* 28, 203–224. doi: 10.1002/bin.1364
- Grindle, C. F., Murray, C., Hastings, R. P., Bailey, T., Forster, H., Taj, S., et al. (2021). Headsprout® Early Reading for children with severe intellectual disabilities: a single-blind randomized controlled trial. *J. Res. Spec. Educ. Needs* 21, 334–344. doi: 10.1111/1471-3802.12531
- Hsieh, H.-F., and Shannon, S. E. (2005). Three Approaches to Qualitative Content Analysis. *Qual. Health Res.* 15, 1277–1288. doi: 10.1177/1049732305276687
- Huffstetter, M., King, J. R., Onwuegbuzie, A. J., Schneider, J. J., and Powell-Smith, K. A. (2010). Effects of a computer-based reading program on the early reading and oral language skills of at-risk preschool children. *J. Educ. Stud. Placed Risk* 15, 279–298. doi: 10.1080/10824669.2010.532415
- Kinder, K., Kubina, R., and Marchand-Martella, N. (2005). Special education and direct instruction: an effective combination. *J. Direct Instr.* 5, 1–36.
- Layng, T. J., Twyman, J. S., and Stikeleather, G. (2003). Headsprout Early Reading: reliably teaching children to read. *Behav. Technol. Today* 3, 7–20.
- Mowbray, C. T., Holter, M. C., Teague, G. B., and Bybee, D. (2003). Fidelity criteria: development, measurement, and validation. *Am. J. Eval.* 24, 315–340. doi: 10.1177/109821400302400303
- Murphy, J., Gray, C. M., van Achterberg, T., Wyke, S., and Cox, S. (2010). The effectiveness of the talking mats framework in helping people with dementia to express their views on well-being. *Dementia* 9, 454–472. doi: 10.1177/1471301210381776
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., et al. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm. Policy Ment. Health Serv. Res.* 38, 65–76. doi: 10.1007/s10488-010-0319-7
- Reichow, B., Lemons, C. J., and Maggin, D. M. (2019). Beginning reading interventions for children and adolescents with intellectual disability. *Cochrane Database Syst. Rev.* 12:858. doi: 10.1002/14651858.CD011359.pub2
- Roberts-Tyler, E. J., Hughes, J. C., and Hastings, R. P. (2019). Evaluating a computer-based reading intervention with children with intellectual disabilities: feasibility and pilot research. *J. Res. Spec. Educ. Needs* 20, 14–26. doi: 10.1111/1471-3802.12458
- Ryan, A., Prieto-Rodriguez, E., Miller, A., and Gore, J. (2024). What can implementation science tell us about scaling interventions in school settings? A scoping review. *Educ. Res. Rev.* 44:100620. doi: 10.1016/j.edurev.2024.100620
- Schieffer, C., Marchand-Martella, N. E., Martella, R. C., Simonsen, F. L., and Waldron-Soler, K. M. (2002). An analysis of the Reading mastery program: effective components and research review. *J. Direct Instr.* 2, 87–119.
- Schultes, M.-C. (2023). An introduction to implementation evaluation of school-based interventions. *Eur. J. Dev. Psychol.* 20, 189–201. doi: 10.1080/17405629.2021.1976633
- Schultes, M.-T., Jöstl, G., Finsterwald, M., Schober, B., and Spiel, C. (2015). Measuring intervention fidelity from different perspectives with multiple methods: the reflect program as an example. *Stud. Educ. Eval.* 47, 102–112. doi: 10.1016/j.stueduc.2015.10.001
- Talking Mats Limited (2014). Effectiveness framework of functional communication. Stirling: Talking Mats Limited.
- Twyman, J., Layng, J., and Layng, Z. (2011). The likelihood of instructionally beneficial, trivial, or negative results for kindergarten and first grade learners who complete at least half of Headsprout Early Reading. *Behav. Technol. Today* 6, 1–13.
- Tyler, E. J., Hughes, J. C., Beverley, M., O'Donnell, P., and Brewster, L. (2015a). Improving early reading skills for beginning readers using an online intervention as supplementary instruction. *Eur. J. Psychol. Educ.* 30, 281–294. doi: 10.1007/s10212-014-0240-7
- Tyler, E. J., Hughes, J. C., Wilson, M. M., Beverley, M., Hastings, R. P., and Williams, B. M. (2015b). Teaching early reading skills to children with intellectual and developmental disabilities using computer-delivered instruction: a pilot study. *J. Int. Spec. Needs Educ.* 18, 1–11. doi: 10.9782/2159-4341-18.1