OXFORD IMPACT EVALUATED

UNIVERSITY OF Southampton

Impact Study

An upstream evaluation of the prototype coaching e-books that will form part of *Oxford Reading Buddy*

Findings from a mixed-method clustered Randomized Control Trial.

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Contents

List of Figures

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Anthony Kelly is Professor of Education at the University of Southampton. He researches in the general area of education policy, school improvement and equity in educational effectiveness, and is particularly interested in the development of theory and methodology in these fields. He has published more than a hundred peer-reviewed papers. His most recent books are on the use of game theory in decision-making (Cambridge University Press), conceptualizing a theory of intellectual capital for use in schools (Kluwer Academic Press), the use of effectiveness data for school improvement (Routledge) and adapting Sen's capability theory to school choice (Palgrave Macmillan). Kelly serves on the board of several peer-reviewed journals and national steering groups in Europe and Asia. He is a Fellow of the Institute of Physics, the Institute of Mathematics, and was elected a Fellow of the Academy of Social Sciences in 2012. He has appeared as an expert witness

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Executive Summary

Background to the study

Oxford Reading Buddy is an online digital reading service (forthcoming at the time of writing) developed by Oxford University Press (OUP). The service consists of a number of elements but one core aspect is a collection of newly written e-books that incorporate a digital 'reading buddy'. This 'reading buddy' is an avatar designed to coach pupils during reading, thereby deepening their comprehension of texts and developing good reading behaviours. A comprehension quiz at the end of each of these 'coaching e-books' aims to assess pupil learning and progress; authorized individuals (commonly teachers and parents) are then able to track learners' reading activities and progress in reading comprehension.

One part of the development of *Oxford Reading Buddy* was the production of prototype coaching e-books that implemented work in progress versions of many of the features of the final product. These prototype coaching e-books – which OUP define as preliminary, pre-market versions – were designed to contribute to the development of the final coaching e-books within *Oxford Reading Buddy* by being subject to an upstream (pilot) evaluation, the findings from which could then be fed back to the OUP development team.

Methods

This **upstream evaluation**[1] aimed to inform the development of the *Oxford Reading Buddy* service by documenting how the prototype coaching e-books could be implemented in schools while assessing their potential impact via a clustered Randomized Control Trial (RCT) – a type of RCT in which *groups* of subjects are randomized rather than individual subjects – that followed 322 Year 1 and Year 5 pupils for one school term. The RCT used a mixed method approach – that is to say, a methodology that from design through to analysis combined both qualitative and quantitative data sources and techniques – that was driven by theories from educational psychology and from the educational research fields of teacher effectiveness and school improvement. It coupled researcher-administered questionnaires that assessed pupils' reading activities and attitudes to reading pre- and post- the introduction of the prototype coaching e-books with teacher interviews and classroom observations to produce a detailed understanding of how the e-books were implemented and used.

Summary of key findings

What impact can the use of the prototype coaching e-books have upon the reading attitudes and reading activities of pupils in Years 1 and 5?

- We found significantly improved attitudes to reading in pupils whose classes had used the prototype coaching e-books in the summer term 2017/18
    - Further analyses showed that this boost to reading attitudes was much more apparent in the Year 5 pupils – pupils who otherwise showed a slight decline in their attitude to reading during this final term of the school year

[1] An upstream evaluation is an initial testing of an intervention or product during the early stages of development in order to refine and adapt it.

To what extent can Year 1 and Year 5 teachers differ in their implementation and use of the prototype coaching e-books?

- Teachers were observed to implement the prototype coaching e-books in three ways:
    - With their whole class and with individual use by each pupil – more common in Year 5
    - With a small group of pupils who accessed their own e-books – more common in Year 1
    - Blended use: a large teacher-led group who engaged in a single e-book projected on a whiteboard, plus a small group who accessed their own e-books – only observed in Year 1

What benefits do teachers associate with using the prototype coaching e-books?

- The common benefits that were identified by the teachers included:
    - The prototype coaching e-books helped to engage pupils with reading by integrating reading with ICT. Teachers were also of the opinion that the coaching buddy questions helped pupils to reflect upon their reading and to engage in higher order thinking skills and that the pupils saw the benefit of the prototype e-books featuring comprehension quizzes at the end. Teachers commented that any tool that can be linked with assessment and tied in with their learning objectives can essentially do two jobs at once: engage pupils in reading while communicating with the teacher whether a pupil has met the learning objective
    - Pupils enjoyed reading the e-books, which helps to foster a love of reading
    - The prototype coaching e-books have potential to further bridge reading at school with reading at home (this being a feature of *Oxford Reading Buddy* not tested in this evaluation)

What challenges do teachers associate with using the prototype coaching e-books?

- The common challenges that were identified by the teachers included:
    - A limited capacity to make full use of the prototype coaching e-books due to insufficient school ICT resources, and time constraints that restricted both reading activities in-class and the capacity of teachers to plan lessons that fully integrated and exploited the capabilities of the prototype coaching e-books
    - A difficulty for some Year 1 pupils to easily access the prototype coaching e-books due to forgetting usernames, passwords and not yet possessing sufficient skills in ICT
    - A limited capability for the prototype coaching e-books to address the interests and needs of all pupils due to a lack of content that keeps reluctant readers engaged and motivated, though this is addressed by the careful levelling of content and a badge reward system within *Oxford Reading Buddy*

In the context of such challenges, it is perhaps unsurprising that we also observed fewer teaching practices that are known to be effective taking place in the literacy lessons within which the prototype coaching e-books were being used. This finding was also in keeping with observations that new teaching resources/approaches can be followed by a temporary drop in the effectiveness of classroom practices (e.g. Borman, Gamoran & Bowdon, 2008; Hannover Research Group, 2014).

What possible impacts on teachers, lessons, and pupil outcomes do Year 1 and Year 5 teachers perceive from using the prototype coaching e-books?

- Before implementing the prototype coaching e-books teachers anticipated impacts such as:
    - Positive impacts upon pupils' engagement with reading due to the use of technology
    - More opportunities for pupils to engage in guided reading
    - Improved preparation of pupils for Year 6 national assessments (SATs)
- Although not all of these anticipated impacts subsequently manifested as perceived *benefits,* others emerged that were not anticipated beforehand (see above)

Recommendations for OUP

It may benefit *Oxford Reading Buddy* for OUP to further reflect upon the following questions:

- Who are the primary intended purchasers of the *Oxford Reading Buddy* service: is it schools or is it schools plus parents?
    - It seems quite possible for parents and teachers to desire different features within the *Oxford Reading Buddy*. For example, the teachers within this evaluation saw benefits to the quiz questions at the end of the coaching e-books sharing the format of the reading comprehension questions within Year 6 national assessments of reading. This is less likely to be a feature at the forefront of parents' suggestions
    - The desire for certain features that are particular to teachers and teaching were also evident in the evaluation's observation of the use of the prototype coaching e-books in front of class instruction with the reading buddy technology being used as a teacher's aide. It seems plausible for both teachers and parents to express additional novel desires for features (yet unknown) once the *Oxford Reading Buddy* service is launched
    - As a result, is there scope for two versions of the online service within *Oxford Reading Buddy*: one created for use by teachers, the other for use by parents? However, this would also require two entirely different product models

- To what extent does OUP wish to specify how schools and teachers use this service?
    - Teachers and schools can differ regarding their preference for a service the use of which is either highly specified or highly unspecified by OUP. However, our interviews with teachers suggested two ways to overcome the tension from these differing preferences: 1. exposure to how other classes or teachers have used or are using the prototype coaching e-books, and 2. the creation of a teacher FAQ database that could answer teachers' possible questions

- What merit is there in OUP commissioning further evaluations that address questions of impact and evaluation that were beyond the scope of this work? Further, if there is merit in carrying out further evaluations, what are the best ways to carry these out?
    - Questions that were beyond the scope of this upstream evaluation included:
        - What impacts and challenges come from implementing the final *Oxford Reading Buddy* and how do these change depending on whether implementation is by schools alone or by schools with parents?

- Can use of the final *Oxford Reading Buddy* yield detectable benefits upon pupils' reading skills – particularly those measured (to a greater or lesser extent) in high-stakes national assessments?
- What impacts and challenges are unique to the various international educational systems where the use of the *Oxford Reading Buddy* is intended? From these, what are the consequences for the core Oxford Reading service?

1. Introduction

1.1 The *Oxford Reading Buddy* service

Oxford Reading Buddy is an online digital reading service (forthcoming at the time of writing) developed by Oxford University Press (OUP). The service consists of a number of elements but one core aspect is a collection of newly written e-books that incorporate a digital 'reading buddy'. This 'reading buddy' is an avatar designed to coach pupils during reading, thereby deepening their comprehension of texts and developing good reading behaviours. A comprehension quiz at the end of each of these 'coaching e-books' aims to assess pupil learning and progress; authorized individuals (commonly teachers and parents) are then be able to track learners' reading activities and progress in reading comprehension.

The coaching element is designed to function in three ways: 1. Modelling and prompting when learners click icons that are embedded in the e-books ('buddy prompts'); 2. Supporting learning by asking questions when learners click icons that are embedded in the e-books ('buddy questions'); and 3. Assessing reading comprehension through a quiz that is embedded at the end of each e-book. As learners progress through the e-books and move up the reading levels, they are awarded badges that are designed to increase intrinsic motivation when a variety of accomplishments are achieved that relate to good reading behaviours and reading comprehension.

1.1.1 *The prototype coaching e-books*

These were created during the development of the broader *Oxford Reading Buddy* service for use in this upstream evaluation, the aims of which are presented in Section 1.3. Seven prototype e-books were developed and trialled, four for use in Year 1 classrooms ("The Night Knight"; "The Seagull"; "The Moon in the Pond"; "Robot Zoo") and three for use in Year 5 ("Crash Landing"; "Road Racing"; "The Feathers in the Flames"). All of these prototype coaching e-books were pitched at an 'average' reading level for the year group. The prototype coaching e-books implemented partial versions of many of the features of the (then) in development *Oxford Reading Buddy* service. These features included:

- Icons embedded in pages that brought up either 'buddy prompts' that modelled the use of a reading strategy or a 'buddy question' that encouraged reflection and provided feedback when incorrect answers were given
- Quizzes added at the end of the e-books that contained multiple choice comprehension questions
- An auditory track that accompanied the text within the Year 1 prototype coaching e-books
- A broader (but temporary) online system within which the prototype coaching e-books were accessed by learners. This system also kept a very basic record of each learner's use of the books and their scores on the comprehension quizzes. *This data was visible to the research team only and not to teachers or pupils.* This prototype online service could be accessed via both computers and tablets

The features that were unavailable in the prototype coaching e-books, but which will be added at launch, included:

- The full and final online system within which the coaching e-books will be hosted (i.e. the full *Oxford Reading Buddy* service)
- The capture and reporting of data from the buddy prompts, buddy questions and comprehension quizzes to teachers and pupils
- The complete library of coaching e-books, including coaching e-books at the full range of primary school reading levels (such that every child has access to a collection of coaching e-books at the right reading level for them)
- Choice of reading buddy avatar
- A seamless link between the coaching e-book and the associated 'end of book' comprehension quiz (in the prototype, pupils were required to access the coaching e-book and the quiz as separate items)
- The digital badges that are designed to reward accomplishments linked to reading strategies and comprehension and so increase pupils' intrinsic motivation to read
- Fully mobile-optimized content – such that the coaching e-books automatically appear and behave differently when a user is on a very small mobile device screen (e.g. mini tablet or smartphone)
- Access to the prototype coaching e-books at home

1.2 Context: Past research regarding the use of e-books and links to pupil outcomes

The proliferation of tablet computers since 2010 has helped to transform the content that children read as well as how this content is being read. For example in 2012, the National Literacy Trust (NLT) surveyed 35,000 children and young people aged 8 to 16 years in the UK and identified:

- 69 per cent of the children and young people reported reading on an electronic device such as a computer, smartphone, and/or tablet. The figure who reported reading from a paper source was just 62 per cent. This was the first time that the NLT had identified e-reading as more popular with children and young people than reading from paper
- 52 per cent of the children and young people reported preferring to read on screen compared to just 32 per cent who preferred to read from paper
- 97 per cent of the children and young people reported having access to an electronic device (Clark, 2013)

This transformation of the reading landscape coincides with the development of terminology that differentiates the current 'tablet era' of reading from the 'pre-tablet era' that preceded it (e.g. Miller & Warschauer, 2014). One consequence has been the need for new evidence concerning the effects of these new practices of reading: *are there benefits*; *are there drawbacks*; and *who experiences any such benefits and drawbacks?*[2] A number of research syntheses have summarized the evidence available at the time of their publication (notably Picton, 2014; Miller & Warschauer, 2014; Bus, Takacs & Kegel, 2015) and their conclusions are supplemented by a number of more recent studies (e.g. Karemaker, Jelley, Clancy & Sylva, 2017; Neumann, Finger & Neumann, 2017; Roskos, Brueck & Lenhart, 2017; Neumann, 2018). Taken together, the evidence presented in these papers suggests that:

[2] As compared to either reading in the pre-tablet era or compared to reading from paper sources in the contemporary tablet era

- E-books are often popular with groups of pupils who are less likely to be reading at the expected level for their age. In turn, this suggests that e-books can present new opportunities for intervention. These groups of pupils have been suggested to include: boys, pupils from socially disadvantaged backgrounds, and pupils with dyslexia (Picton, 2014; Miller & Warschauer, 2014)
- The benefits from e-reading rather than print reading are inconsistent (Miller & Warschauer, 2014; Bus, Takacs & Kegel, 2015; Roskos, Brueck & Lenhart, 2017). For example some studies have linked e-reading (rather than print reading) to poorer comprehension and recall. However, both the OECD and the NLT conclude that there benefits to reading a 'mixed diet' of e-reading and reading from paper sources (Picton, 2014; also Neumann, 2018)
- The presence of **text-to-speech** features – the ability of the e-book to convert the written word into audio features – within e-books can risk substituting for learners' independent reading (Miller & Warschauer, 2014; Karemaker, Jelley, Clancy & Sylva, 2017)
- We still know little about the technological, pedagogical, physiological, and psychological processes[3] that are specific to, and which underpin, the potential (and/or inconsistent) impacts of e-reading upon literacy development (Miller & Warschauer, 2014; Karemaker, Jelley, Clancy & Sylva, 2017; Neumann, Finger & Neumann, 2017; Roskos, Brueck & Lenhart, 2017)

1.3 Aims of the evaluation

This evaluation aimed to inform the development of the *Oxford Reading Buddy* service by documenting how the prototype coaching e-books could be implemented in schools while assessing their potential impact via a clustered Randomized Control Trial (RCT) that followed 322 Year 1 and Year 5 pupils for one school term. The RCT used a mixed method approach that was driven by theories from educational psychology and from the educational research fields of teacher effectiveness and school improvement. It coupled researcher-administered questionnaires that assessed pupils' reading activities and attitudes to reading pre- and post- the introduction of the prototype coaching e-books with teacher interviews and classroom observations to produce a detailed understanding of how the e-books were implemented and used.

1.4 Research questions

Concerning *impact* on pupils in Years 1 and 5:

1. What impact can the use of the prototype coaching e-books have upon the reading attitudes and reading activities of pupils in Years 1 and 5?

Concerning *implementation and use* of the prototype coaching e-books that will form part of the *Oxford Reading Buddy* service:

2. To what extent can Year 1 and Year 5 teachers differ in their implementation and use of the prototype coaching e-books?
3. What benefits and/or challenges can be experienced by Year 1 and Year 5 teachers when implementing and using the prototype coaching e-books?

[3] For example: beneficial digital architecture, what constitutes effective rather than ineffective scaffolding, the eye movements that can take place during e-reading, and how e-reading relates to cognitive information processing systems.

4. What possible impacts (i.e. potential consequences that could shape teaching and learning practices by a teacher, which in turn could influence the uptake of the product) on teachers, lessons, and pupil outcomes do Year 1 and Year 5 teachers perceive from using the prototype coaching e-books?

2. Methods

2.1 Sample

The evaluation team drew a random sample of schools from those that met four inclusion criteria: they were in the south of England (as a convenience sample), they had dual-forms (i.e. two class groups per year group), they were publicly funded, and they had expressed an interest in trialling the prototype coaching e-books. The result was a sample of three primary schools, six Year 1 classrooms (plus teachers; two per school), six Year 5 classrooms (plus teachers; two per school), and 322 pupils in Years 1 and 5 (all pupils in all sampled classrooms): 163 in Year 1 and 165 in Year 5. The exclusion of the other year groups in the schools was deliberate; it helped to achieve a balance between an evaluation that yielded findings applicable across the primary school age range (ages 5 to 11) and an evaluation that was not disruptive to pupils who were undertaking standard national assessments (in Years 2 and 6).

Ethical permission for the evaluation was granted by the University of Southampton's Research Ethics Committee. Primary schools and teachers were recruited via an opt-*in* informed consent procedure via emails and phone calls. Pupils were recruited via an opt-*out* informed consent procedure in which information leaflets and opt-out consent forms were sent to all the parents of the pupils in the participating classrooms. Ethical permission for the use of the opt-out recruitment procedure was granted because the evaluation team were carrying out no activity with the pupils that lay outside normal classroom practice, i.e. teacher assessments of pupils' reading activities and their attitudes to reading. By way of thanks, OUP granted the three participating schools free access to the full (at the time unlaunched) *Oxford Reading Buddy* service until January 2020.

2.2 Design

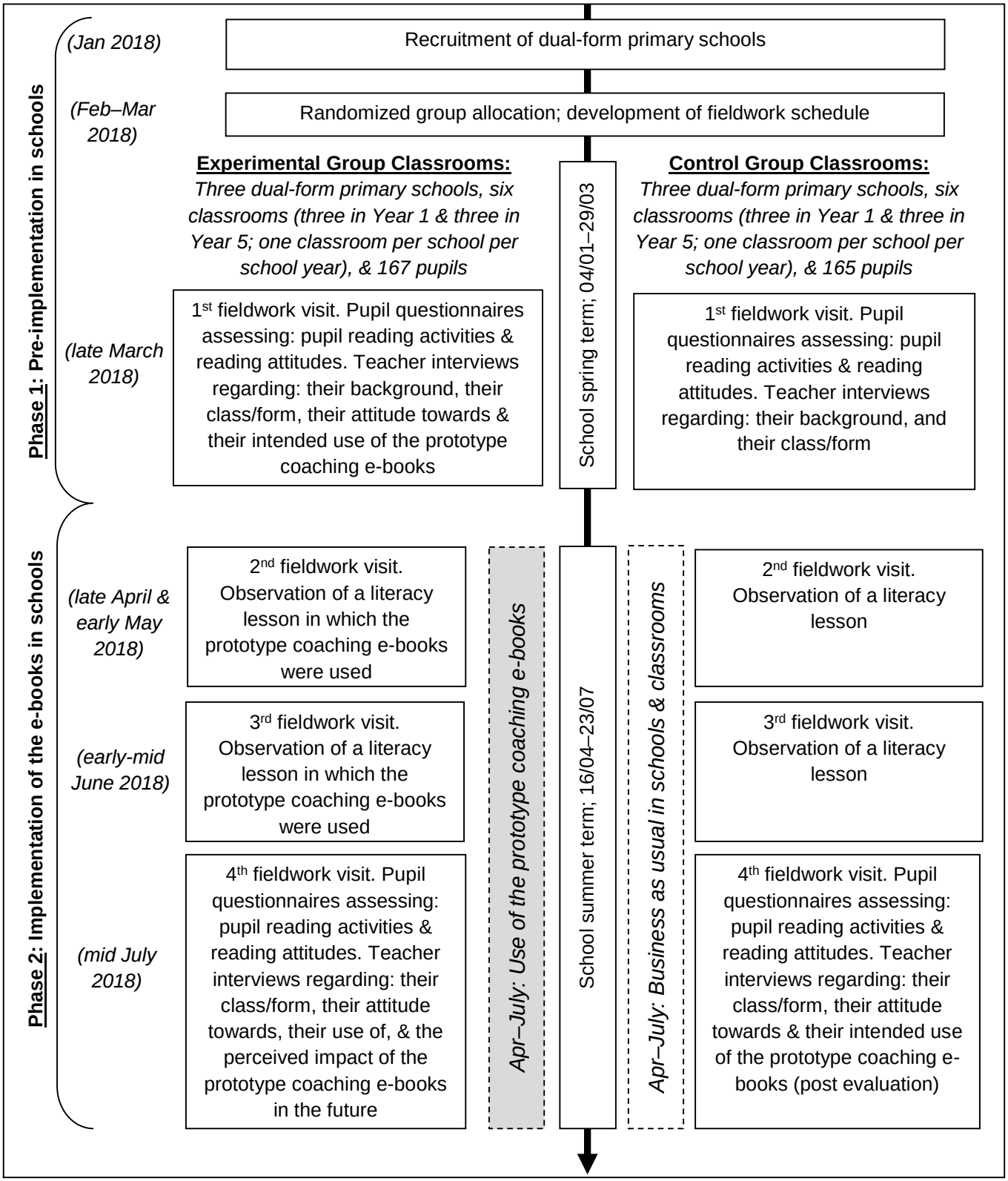
The possible impacts and implementation of the prototype coaching e-books (see Section 1.4) were evaluated through use of the 'gold standard' scientific technique for demonstrating cause and effect: a (clustered) Randomized Controlled Trial (RCT; e.g. Sullivan, 2011). Work began in schools in spring 2018 when the twelve sampled classrooms were randomly allocated into one of two groups: an '**experimental group**' that would use the prototype coaching e-books during the 2018 summer term (six classrooms) and a '**control group**' that would not (also six classrooms). Classrooms were randomly allocated to one of these groups by consideration of each pair of classrooms within each year group within each school. In this way, equal numbers of classrooms in Years 1 and 5 would use the prototype coaching e-books while the unique features of each primary school and school year would be equally represented in both experimental groups. Randomizing classrooms to the two experimental groups in this manner was intended to increase the rigour of the experimental design by making the presence of differences between pupils and classrooms (school years, classroom compositions) more 'balanced' across the two experimental groups (see Savage, Abrami, Piquette, Wood, Deleveaux, Sanghera-Sidhu & Burgos, 2013; Puffer, Torgerson & Watson, 2005). The pupils and teachers in the classrooms that were randomly assigned to use the prototype coaching e-books each had a unique username and password created for them by OUP and these were confidentially distributed to (and by) the appropriate teachers in each participating school.

Four measurement points featured in this RCT: March 2018, April–May 2018, June 2018, and July 2018. In *March* and in *July*, pupils completed questionnaires that measured their attitudes towards reading and the extent of their reading activities. Teachers were also interviewed regarding their background, the class/form that had just completed the questionnaires, plus (where appropriate): their attitude towards, their use of (intended then realised), and their **perceived impact** of the prototype coaching e-books. The teacher interviews were semi-structured to ensure consistency in the topics that were discussed. In *April–May* and in *June*, a literacy lesson was observed in each of the participating classrooms with those in the 'experimental group' observed as they used the prototype coaching e-books. Both structured and semi-structured observation schedules were used during this element of the evaluation in order to permit fair comparisons of literacy lessons while also achieving an in-depth account of the unique activities that were taking place in each classroom. All fieldwork was carried out by a single researcher who had co-developed the questionnaires and the semi-structured interview and observation schedules. Figure 1 illustrates the research design that was used in this evaluation on a timeline divided into two 'phases': pre- and post- the implementation of the prototype coaching e-books in six classrooms across three primary schools (Appendix 1 shows the timetable for the data collection activities that were carried out).

2.3 Measures

Attitudes towards reading in Year 1 and Year 5 pupils: Pupils' attitudes towards reading were measured using a questionnaire developed by the research team and which featured a response format that was adapted from past research (Hall, Lindorff & Sammons, 2016; Barber & Houssart, 2011). This past research had developed (and piloted) a questionnaire that could be administered to whole classes of Year 1 pupils through use of auditory (oral) delivery of questions, colour-coded items, a visual response format, and two 'warm-up' items (see Appendix 2). However, the questionnaire that was used in this evaluation was required to adapt this prior instrument in response to its different research aims and methods: the consideration of Year 1 and Year 5 pupils and consideration of a different area of learning and education (reading rather than mathematics). Additional content for the questionnaire was developed following an analysis of the content within the Motivation for Reading Questionnaire (MRQ; Wigfield & Guthrie, 1997), a well-known and cited questionnaire that is used with pupils who are in the latter stages of primary school. Reference to the content of the MRQ was also carried out because it is commonly used alongside its companion questionnaire that considers the reading activities of pupils (the Reading Activity Inventory (RAI; Guthrie, McGough & Wigfield, 1994) with the content and structure of the RAI being reflected upon during the development of a new questionnaire by this investigation (see the subsection below titled, '*Reading activities in Year 1 and Year 5 pupils'*).

Figure 1. The research design used to evaluate the prototype coaching e-books that will form part of the *Oxford Reading Buddy* service: a clustered Randomized Controlled Trial over one school term



The questionnaire that was used in this evaluation to assess the attitudes towards reading of pupils in Years 1 and 5 consisted of a 'core' set of five questions that were asked of all pupils and to which pupils responded on a four-point rating scale (1="very unhappy", 2="unhappy", 3="happy", 4="very

happy"; see Appendix 2). Three further questions (using the same response format) were also asked of the Year 5 pupils. In this way, there was both a common core of content to facilitate the investigation of potential impact across all pupils, plus a tailoring of content to reflect the anticipated differences in reading activities across different age ranges. The five core questions were:

1. Reading at home makes me feel…
2. Reading books makes me feel…
3. Reading on a computer or on a tablet makes me feel…
4. Answering questions about a story I read makes me feel…
5. Getting to choose what I read makes me feel…

The three additional questions for pupils in Year 5 were:

1. Getting a book for a present would make me feel…
2. Talking about books with my friends makes me feel…
3. Learning what a new word means makes me feel…

A single common measure of the attitudes towards reading of all of the pupils (Year 1 and Year 5) was created by taking the median response of each pupil's response to the five core questions. A more detailed measure was taken regarding just the attitudes of the Year 5 pupils following the same numeric procedure, but carried out on all eight items. The consistency with which these questions measured pupils' reading activity was then assessed through calculation of a series of Guttman's Lambda 2 values[4] where scores ranged from 0.55 (for all pupils, when tested in March) to 0.81 (for Year 5 pupils, when tested in July).

Reading activities in Year 1 and Year 5 pupils: Pupils' reading activities were measured with a series of binary "yes"/"no" questions that each asked whether a pupil engaged in a certain reading activity. These questions were then summed to create a scale that measured the breadth of reading activity undertaken. As with the questions measuring pupils' reading attitudes, there was a set of five 'core' questions that all pupils answered, plus a set of extension questions that were only asked of the pupils in Year 5 (see Appendix 3). Again mirroring the questionnaire measuring pupils' attitudes to reading, the questionnaire measuring the breadth of reading activities was administered in a whole class format, with auditory (oral) delivery of questions, colour-coded items and a visual response format. The development of this questionnaire was also informed by the content of the Reading Activity Inventory (RAI; Guthrie, McGough & Wigfield, 1994) though altered and expanded to reflect that we now engage in reading within in the 'tablet era' of the 'digital age' (Miller & Warschauer, 2014). The five core questions were:

1. I read story books/fiction books at home ["story books" for Year 1; "fiction books" for Year 5]
2. I read books with facts in them at home
3. I have a favourite book at home
4. I read stories on a computer at home
5. I read stories on a tablet at home

The five additional questions for pupils in Year 5 were:

1. I read things other than stories on a computer at home

[4] A statistic shown to be more trustworthy than the traditional Cronbach's Alpha (AKA, 'Guttman's Lambda 3 values') – though these share the same traditional threshold value (≥0.60) that denotes a 'good' consistency of scores (Sijtsma, 2009)

2. I read things other than stories on a tablet at home
3. I read comics or magazines at home
4. I read while going places (for example, in the car or on the bus)
5. I tell my friends about good books that I read

Lesson observations: An observation of a full literacy lesson was carried out for each teacher twice during the summer term (in May and in June). These visits involved both structured and semi-structured observations, with the structured observations using an existing research instrument that focuses upon 27 teaching practices and behaviours within primary school literacy lessons that past research has shown to be effective at developing and extending literacy. The 27 practices contained within this research instrument, the Classroom Literacy Observation Schedule – Revised (CLOS-R; Louden, Rohl & Hopkins, 2008), are observed on a "yes/no" basis, are presented in full in Appendix 4, and sum together in six ways:

1. The *total number of effective teaching practices* observed during a literacy lesson
2. A subscale concerning *teaching respect*
3. A subscale concerning *teaching knowledge*
4. A subscale concerning *differentiation*
5. A subscale concerning *orchestration*
6. A subscale concerning *providing support*

The semi-structured element of the lesson observations involved the collection of narrative field notes following the procedures developed and documented by Sammons, Kington, Lindorff, and Ortega (2014). The structure of these field notes aimed to provide a rich description of each: classroom setting, lesson structure, organization and flow of the lesson, the nature of the activities within the lesson (particularly the use of the prototype coaching e-books), and the interactions between the teacher and the pupils. Example quotes from teachers were taken that demonstrated teacher strategies for dealing with challenging behaviour and strategies for encouraging pupils' learning, motivation, and positive attitudes to schoolwork.

Semi-structured interviews with teachers: Interviews with the Year 1 and Year 5 teachers who were using the prototype coaching e-books were carried out on a one-to-one basis in March and in July. Information on teachers' professional backgrounds was gathered in the March interviews and was integrated with the numerical data to enable us to take better account of differences between teachers when considering potential impact (see Appendix 5). However, the majority of the interview questions were not designed for such integration. Instead, they were open-ended questions that were designed to elicit information on:

1. Teachers' views on the prototype coaching e-books
2. Teachers' confidence in implementing then using the prototype coaching e-books, plus teaching reading more generally
3. Comparative thoughts regarding the prototype coaching e-books compared to similar materials and approaches that they (or their pupils) may have used previously
4. Any perceived benefits from using the prototype coaching e-books for the teachers themselves and/or for their class
5. Any challenges and areas for future development

2.4 Analytic strategy

Numeric data from the assessment of pupils' attitudes towards reading, reading activities, and from the observations of literacy lessons were analysed statistically. Appendix 5 provides full details of the analytic statistical strategy that was used in this evaluation, plus full descriptions of the measures that featured in these analyses. A series of statistical analyses were carried out to estimate the impact and implementation and use of the prototype coaching e-books and these looked at differences between the experimental and control groups over the course of the 2017/18 school summer term.

Text data from the semi-structured interviews with teachers (transcribed audio recordings plus spontaneous filed notes) and from the semi-structured observations of the use of the prototype coaching e-books were analysed thematically. Results from both the statistical analysis and the thematic analyses are presented in Chapter 3, where results are mapped onto each of the evaluations' research questions explicitly.

3. Findings

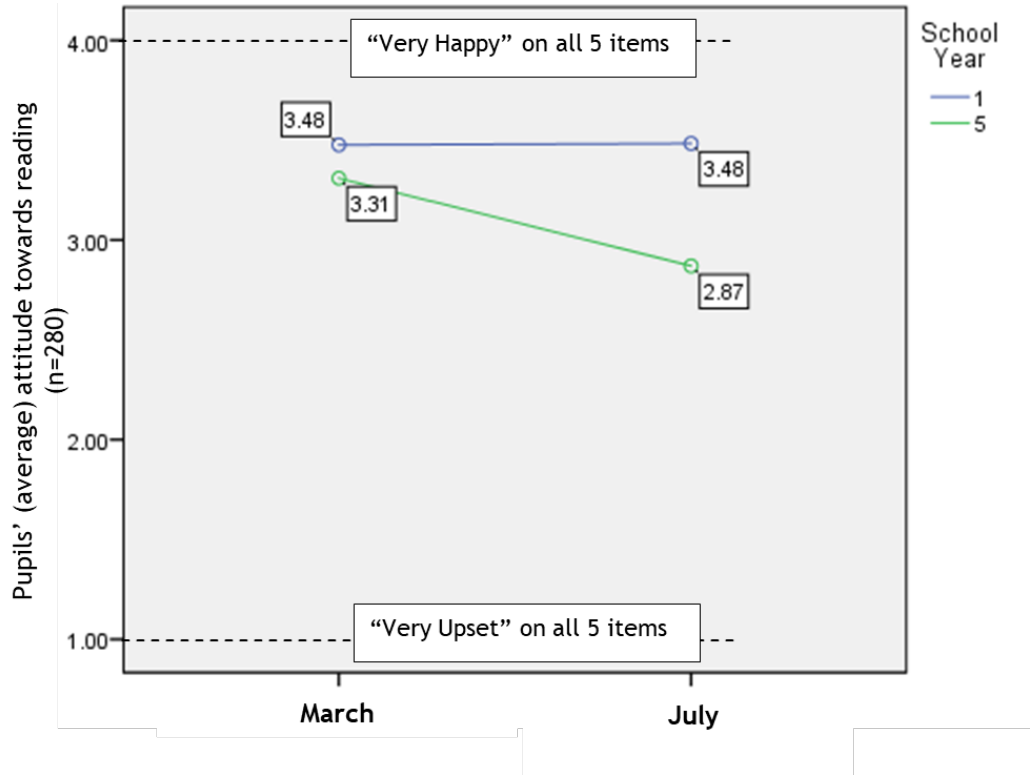
3.1 Pupil reading attitudes and reading activities

Research Question 1: ***What impact can the use of the prototype coaching e-books have upon the reading attitudes and reading activities of pupils in Years 1 and 5?***

3.1.1 Reading attitudes

We consider first all the pupils who took part in this evaluation – both those who did and those who did not use the prototype coaching e-books. Figure 2 illustrates that pupils in Years 1 and 5 differed in their attitudes towards reading before and after the school summer term 2017/18. The average Year 1 pupils' attitude towards reading remained consistently high during the summer term (between "Happy" and "Very Happy"). However, the attitude towards reading shown by the average Year 5 pupil slightly declined over this same period[5] although it still remained (on average) closer to happy than to unhappy.

Figure 2. How the average pupils in Year 1 and Year 5 differed in their attitude towards reading before and after the school summer term 2017/18



The interviews with teachers that took place in March and July support the differences that were found between the reading attitudes of the Year 1 and the Year 5 pupils over this period (as shown in Figure 2). When questioned, the Year 1 teachers were much more positive concerning their pupils'

[5] F=3.17; p=0.011; n_p^2=0.02 (2% variation explained in pupils' attitudes to reading). Controlling for differences linked to: test dates in March and July, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession

engagement and positive attitudes towards reading. By contrast, the Year 5 teachers noted that their pupils seemed less engaged with reading (with the exception of 'exciting' or 'funny' books) than they were engaged with other subjects such as mathematics.

> *"They like going to the library. They like 'meet a book' in the library. They get really excited about going to the library. When they find a text that we have read in class, in the library, they will come and say 'I have found something by so and so.'"* School 1, Year 1 teacher

> *"They spend so much time on their gaming stations. I mean how many actually sit down and read a book compared to something on a digital system? That is interesting. We are moving away from books, aren't we?"* School 2, Year 5 teacher

Next we consider differences between the experimental and control groups[6] (those who did and did not use the prototype coaching e-books during the summer term): before the summer term there was no **statistically significant**[7] difference in the attitudes towards reading that were shown by the average pupils in both groups[8]. However, by the end of the summer term a statistical difference had emerged (see Figure 3). The pupils who had been in classes where their teachers had used the prototype coaching e-books were found to show a small yet significant gain in the attitudes towards reading when compared to their counterparts in classes where the prototype coaching e-books had not been used[9]. In other words, the average pupil in the experimental group indicated greater happiness across reading than did the average pupil in the control group. The scores of 3.32 and 3.03 shown in Figure 3 are average scores from the five questions that asked about pupils' attitudes towards reading[10]. The score of 3.03 indicates that the average pupil in the control group was "Happy" with reading; the score of 3.23 indicates that the average pupil in the experimental group was more than "Happy" with reading. The maximum possible score for these numbers was 4, which would be returned for a pupil who indicated that they were "Very Happy" across all five questions that asked about their happiness with reading (for further information see Section 2.3).

Teachers also commented that pupils who were viewed as reluctant readers were seen to engage positively with the prototype coaching e-books. One teacher was actually surprised with the level of engagement and motivation of some of their pupils, especially pupils with behaviour problems.

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[6] An intervention group is one where an intervention or treatment is applied to measure observable differences due to the intervention. A control group is a group where no intervention/treatment is applied in order to compare with the intervention group to ensure that any changes occurring are (more likely) due to the intervention/treatment rather than to any other factor.

[7] Statistical significance is the likelihood that the relationship between two or more variables is due to more than just chance.

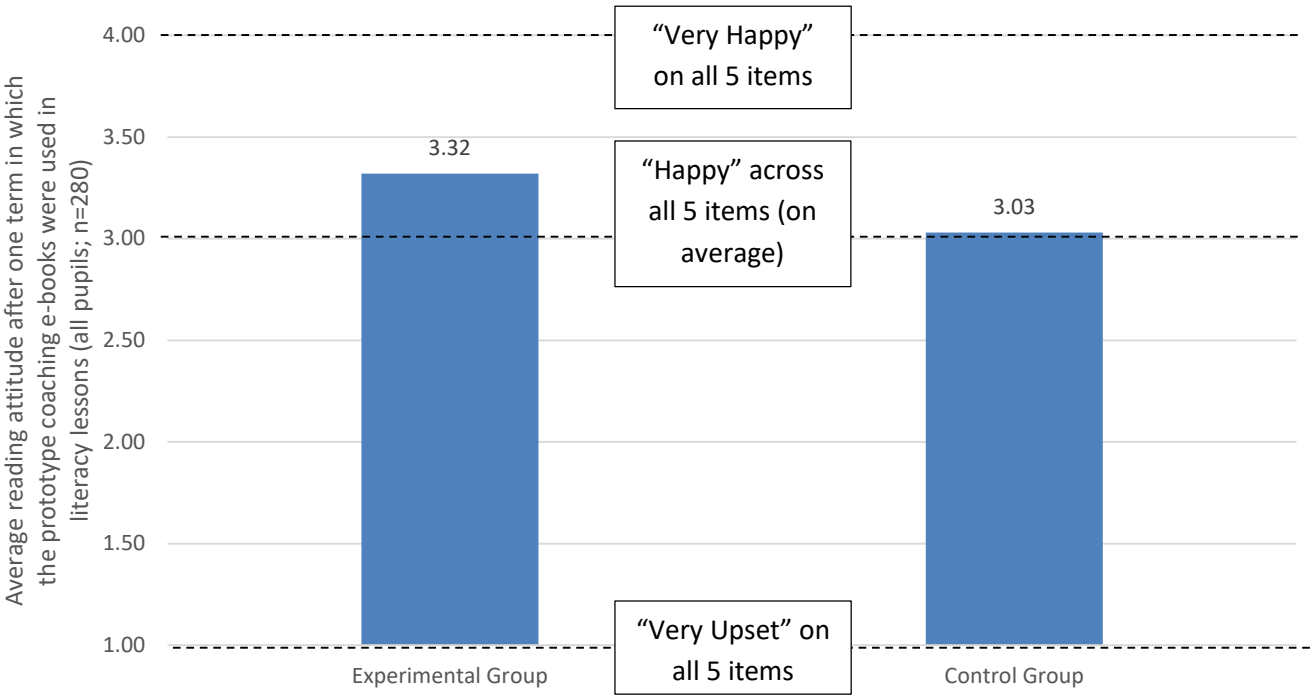
[8] Multilevel Effect Size = 0.15 standard deviations (SE=0.11, p=0.275) representing the average difference in the mean scores of the two experimental groups after controlling for: test dates in March, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 6.

[9] Multilevel Effect Size = 0.37 standard deviations (SE=0.14, p=0.040) representing the average difference in the mean scores of the two experimental groups after controlling for: test dates in March and July, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 6.

[10] "Reading at home makes me feel…", "Reading books makes me feel…", "Reading on a computer or on a tablet makes me feel…", "Answering questions about a story I read makes me feel…", "Getting to choose what I read makes me feel…"

> *"Their engagement has been really high with respect to the prototype coaching e-books. Certainly, when you have something new and relevant, students will engage more. Certainly, one child with behaviour issues was really engaged and had some outstanding responses with regards to how the tool could be improved. I wasn't expecting the level of engagement that some children had with the prototype coaching e-book."* School 2, Year 5 teacher

Figure 3. The average pupil's attitude towards reading was significantly greater if they had been in a classroom that had used the prototype coaching e-books during the summer term 2017/18

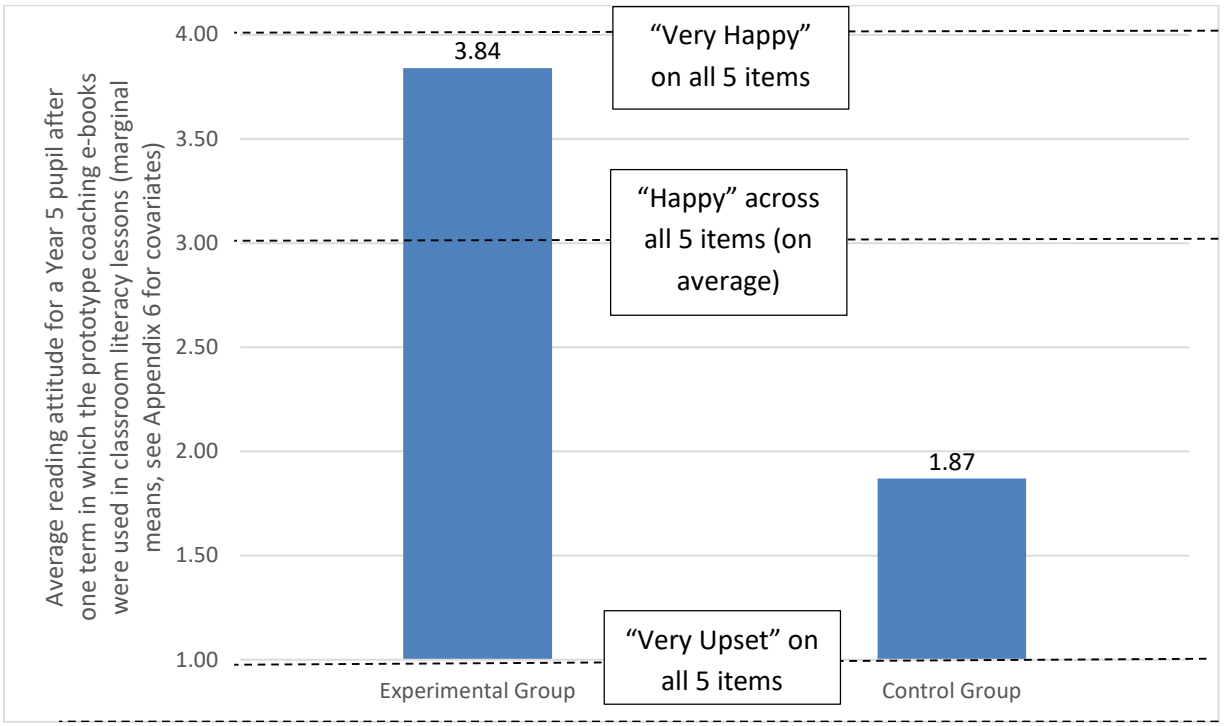


Further analyses revealed that the differences observed between the Year 1 and the Year 5 pupils (Figure 2) played an important explanatory role in the difference in attitude towards reading that was shown by the average pupil in the experimental group compared to their control group counterpart (Figure 3). The difference between attitudes of the average pupils in the experimental and control groups was concentrated in Year 5. The pupils who had been in Year 5 classes where their teachers had used the prototype coaching e-books were found to show a large and significant gain in the attitudes towards reading (see Figure 4 and Appendix 6) when compared to their counterparts in Year 5 classes where the prototype coaching e-books had not been used[11]. However, to understand the implications of this finding for the 'real world' requires understanding the context within which this gain was shown: the introduction of prototype e-books to six classrooms during a summer term where pupils' attitudes to reading were otherwise declining and where the use of the prototype coaching e-books within literacy lessons was subject to teacher preferences (see the sample scenarios presented in Appendix 7). This limits the finding such that it indicates that impacts are possible – but are not guaranteed (more details in Section 4.3). Nonetheless, we also know that

[11] Multilevel Effect Size = 3.00 standard deviations (SE=0.84, p=0.021) representing the average difference in the mean scores of the two experimental groups after controlling for: test dates in March and July, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 6.

the introduction of the prototype coaching e-books into classrooms during the summer term 2017/18 was certainly not associated with any negative effect upon pupils' attitudes towards reading.

Figure 4. The average Year 5 pupil's attitude towards reading was significantly greater if they had been in a classroom that had used the prototype coaching e-books during the summer term 2017/18



3.1.2 Reading activities

Again, we first consider all the pupils who took part in this evaluation – both those who did and those who did not use the prototype coaching e-books. Figure 4 shows how the Year 1 and the Year 5 pupils' reading activities changed during the 2017/18 summer term. The numbers shown in the graph (e.g. '1.61') are the average number of reading activities that pupils reported at that time and in that year group (1.61 is the average number of reading activities reported in March by pupils in school year 1). In March, there was no significant difference between the average pupils within the two year groups[12] when comparing the number of reading activities that they engaged in: both carried out between one and two of the five core reading activities[13]. However, by July the reading activities of the average pupil in each year group had diverged such that the average Year 5 pupil reported that they now engaged in two-three of the core reading activities – significantly more than

[12] Multilevel Effect Size = 0.07 standard deviations (SE=0.04, p=0.062) representing the average difference in the mean scores of the two year groups after controlling for: test dates in March, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 8.

[13] Reading story books/fiction books at home; reading books with facts in them at home; having a favourite book at home; reading stories on a computer at home; reading stories on a tablet at home

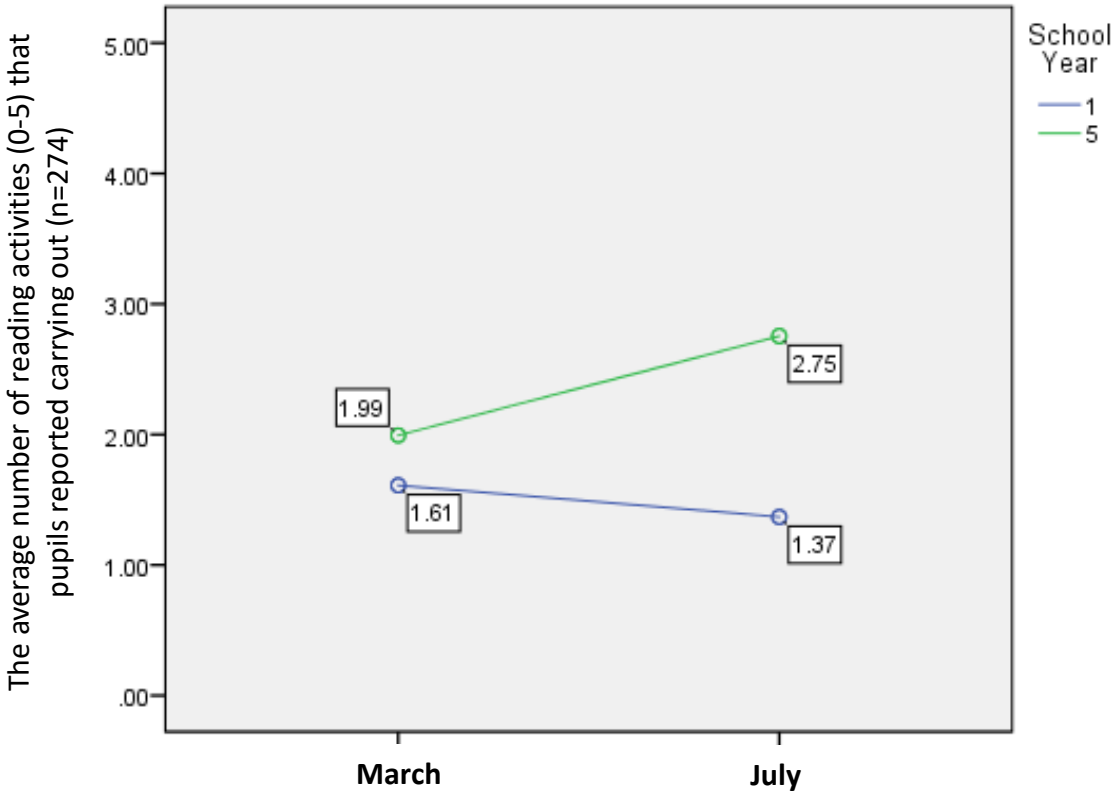
the one-two activities reported by the average pupil in Year 1.[14]. In other words, the average Year 5 pupil reported engaging in an increased number of reading activities during the 2017/18 summer term, this despite them simultaneously reporting a less positive attitude to reading across the same period.

Next we consider the potential for differences between the pupils in the experimental and control groups (those who did and did not use the prototype coaching e-books during the summer term). We observed broad consistency across the two experimental groups; in other words, the average number of reading activities that were engaged in by pupils were the same in both of these groups.[15]. Thus, and in contrast to pupils' attitudes towards reading, this evaluation did not detect any significant link between the use of the prototype coaching e-books in classrooms during the summer term 2017/18 and an associated change in the range of reading activities that pupils engaged in.

[14] Multilevel Effect Size = 0.24 standard deviations (SE=0.05, p<0.001) representing the average difference in the mean scores of the two year groups after controlling for: test dates in March and July, pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 8.

[15] In March, Multilevel Effect Size = 0.25 standard deviations (SE=0.18, p=-0.127); in July, Multilevel Effect Size = 0.44 standard deviations (SE=0.24, p=0.050), these effects representing the average difference in the mean scores of the two experimental groups after controlling for: test dates in March and (July as appropriate), pupil gender differences, teachers' self-reported confidence when it comes to teaching reading, and teachers' self-reported years' experience in the teaching profession. See Appendix 8.

Figure 5. The average difference between pupils in Years 1 and 5 by the range of their reading activities (0–5) during the summer term 2017/18



3.2 Teachers' implementation and use of the prototype coaching e-books

Evidence regarding the ways in which teachers implemented and used the prototype coaching e-books was obtained through observations of classroom practice during literacy lessons in the 2017/18 school summer term and through interviews with the teachers themselves (for details see Figure 1 in Section 2). The interviews yielded text information regarding implementation and use while the observations of classroom practice produced evidence that was both textual and numeric.

Statistical analysis of the numeric data from the observation of literacy lessons revealed that when teachers introduced the prototype coaching e-books then this was associated with a notable reduction in the number of known effective teaching practices that took place[16]. The only exception to these findings concerned teaching practices that taught pupils respect – these were equally present in the average literacy lesson that both featured, and did not feature, the use of the prototype coaching e-books. However, and as with the results concerning pupils' attitudes to reading, to understand what these results mean in the 'real world' requires understanding the context within which the differences between literacy lessons were observed. The reduction in the number of effective teaching practices in literacy lessons was observed as the prototype e-books were being introduced into six classrooms during a summer term in which pupils' attitudes to reading were declining and where the use of the prototype coaching e-books was subject to teacher preferences. Therefore, these findings are limited to suggesting that the integration of the prototype coaching e-books into effective literacy lessons can be difficult – though this need not be so (further

[16] 'Notable' being used to denote statistically 'large' differences between the average classrooms in the experimental and control groups. See Appendix 9 for the full statistical results.

details provided in Section 4). That said, we also know that it takes time for new teaching approaches to become fully embedded in lessons (e.g. Borman, Gamoran & Bowdon, 2008; Hannover Research Group, 2014) and we know that the introduction of the prototype coaching e-books into classrooms was not associated with any significant negative effects upon pupils' attitudes towards reading or upon the range of their reading activities. It is therefore reasonable to ask, "What was happening and what challenges were experienced during the literacy lessons in which the prototype coaching e-books were used?" with answers to this question coming from field notes that were taken during the observations and from the interviews that were carried out with teachers.

Research Question 2: ***To what extent can Year 1 and Year 5 teachers differ in their implementation and use of the prototype coaching e-books?***

Results regarding the implementation and use of the prototype coaching e-books in literacy lessons have so far in this report been limited in scope (the presence or absence of 27 teaching practices) in order to facilitate a formal (fair) comparison of the average classroom within each of the experimental groups. However, this is not the sole source of evidence gathered by this evaluation concerning the implementation and use of the prototype coaching e-books within literacy lessons in school years 1 and 5, nor is this information sufficient in order to provide a full account of implementation. Further sources of information were obtained from the gathering of field notes during the observations and from the interviews that were conducted with teachers. Both of these sources of evidence serve to elaborate upon the differences in implementation that were observed between literacy lessons and upon the differences in implementation that were observed between teachers.

When the first round of interviews took place in March, it was common for teachers to note that the time dedicated to reading during the school day was minimal as compared to the time dedicated to other subjects. Teachers were keen to stress that, in their opinion, this therefore limited the range of activities that they were able to use in class (and therefore the activities that they would be able to use with prototype coaching e-books). However, despite this shared opinion regarding limitations to time dedicated to reading, teachers also differed from one another in the approaches that they used in literacy lessons. Teachers who were excited about reading, who loved to read, and who wanted to foster that intrinsic love of reading among pupils, were also those who were observed to teach reading lessons in which pupils were the most engaged in the reading.

> *"It depends on the book. They could be equally excited about a book as they would be for any other subject. If you ask the class, they would say reading is one of their least favourite lessons to be honest. If I am excited about the book, if I want to know what happens next, then in general, the whole class is excited. I don't plan reading, so, it is pretty much set what we are going to read for the entire year. But, I read class text on the side."* School 1, Year 5 teacher

When they reflected upon the prototype coaching e-books and how they were used during literacy lessons, it was common for teachers to comment that they had remained unaware of many of the features of the prototype coaching e-books. Further, this was despite all schools receiving an OUP-run training session in their school in early May within which models of common e-book implementation and use were presented (as envisaged by OUP; see Appendix 10). However, some

teachers did not attend these sessions and subsequently speculated that this had the consequence of limiting the circulation of OUP's models of common usage. Teachers also stressed that their pre-summer workloads were high enough to cause negative impacts upon memory. As a result, it is perhaps unsurprising that the majority of teachers were also not aware of the quizzes at the end of each of the coaching e-books (see Section 1). Looking to the future, the teachers made three suggestions as to how OUP might increase other teachers' familiarity with the e-books and the e-book system: 1. A refresher training session at the beginning of the school year; 2. Exposure to how other classes or teachers have used/are using the prototype coaching e-books; and 3. Including a teacher FAQ database that could answer possible questions teachers may have as they implement the prototype coaching e-books.

> *"Once I start using it and dabbling with it, then I probably would have questions about its use. An FAQ system would be really helpful to answer these questions."* School 1, Year 5 teacher

> *"We had a little talk a while ago, but another training session would be useful to be able to implement anything effectively."* School 2, Year 1 teacher

> *"If it is going to be part of our programme next year then it would be really useful to get some training next year."* School 3, Year 1 teacher

The observations of reading lessons that took place in May and June[17] also revealed that teachers often asked pupils to read the prototype coaching e-books independently, be it on tablets or on laptops, but with no link to lesson objectives or with follow-up activities. However, this partial integration of the prototype coaching e-books into literacy lessons was not universal across all the types of usage that were observed. It was more common when teachers prompted individual pupil use within a whole class or with small groups and it was less common when teachers used a single e-book with multiple pupils at the same time, be it pairing pupils to read an e-book together or with the teacher leading a large group as they read from a whiteboard. Each of these distinct patterns of implementation and use is now reflected upon in turn.

> *"During my training, we did guided reading separate to English. But here, we do reading as a whole class, where I do lots of questioning while we are reading, so it has been different to how I did it in the old school. It is hard trying to manage five different activities. Workload-wise, it has been really good to teach whole class. You are probably exposing those lower ability readers to higher ability texts, which would also help them with their writing. Some of my boys, my reluctant readers, when we were reading a good book, helped their writing. You could see that through their writing".* School 3, Year 5 teacher

> *"When I can, I try to get them working in pairs, so they don't have to sit in silence and do it. I use the fact they like to talk to try and do work."* School 2, Year 5 teacher

[17] Where reading lessons were observed to last (typically) between 20 and 30 minutes and where more time was given to writing and phonics in Year 1 but SPAG (spelling, punctuation and grammar) in Year 5

3.2.1 Whole class, individual pupil use

This whole class approach was more commonly observed within literacy lessons in Year 5 than in Year 1 (vice versa for ability groups; see Section 3.2.2 below) and this was consistent whether or not a class was using the prototype coaching e-books. Where the prototype coaching e-books were used with whole classrooms, this commonly involved pupils being asked to read the prototype coaching e-books individually on laptops. However, differences between teachers were observed in the question and answer approaches that they used with their classes. For example, teachers confident in their classroom practice and those who had established a rapport with their pupils were observed to make greater use of sufficient wait time and more appropriate follow-up questions in order to effectively establish a deeper understanding. Further, only one teacher was observed attempting to link the reading of a prototype coaching e-book to the learning objectives of the lesson.

One particularly well integrated use of the prototype coaching e-books involved a Year 1 teacher engaging pupils in the reading activities through whole class reading, asking pupils to attempt the quizzes at the end of the books then checking answers. Additionally, this teacher created and then assigned to the whole class a follow-on drawing activity that was linked to the prototype coaching e-books that they had just read (see Appendix 11). This was not the only follow-on reading activity however. For example, a different Year 1 teacher was observed requesting that pupils extract adjectives from the prototype coaching e-book that had just been read while a Year 5 teacher asked pupils to elaborate on the organizational layout of fiction versus non-fiction books. It could be speculated that such activities were added as a way for the teachers to link the reading activities to broader learning objectives in class to make reading the prototype coaching e-book more meaningful and not viewed by the pupils as 'free time'.

3.2.2 Small group, individual pupil use

Unlike the whole class approach that was more commonly observed in Year 5 (see Section 3.2.1 above), individual pupil use within small groups was more commonly observed in Year 1 classrooms. For example, the teachers of two of the Year 1 classes were observed to start a reading lesson with all pupils seated on a shared carpet. The teachers would then either review phonics or read a text for the pupils and ask oral questions that were related to this text for approximately five minutes. For example, the teacher would ask about definitions of terms she might feel the children were not familiar with. The teachers then divided their classrooms into small groups each with a set task, where one group's task would be to make independent use of the prototype coaching e-books. In one school, pupils were observed using tablet computers and in another they used laptops. In both classes, pupils had the logins and passwords already entered for them on devices that were already placed on their desks – this to ensure a smooth transition between tasks. In one observed lesson pupils were not given further instructions on the use of the prototype coaching e-books whereas in another pupils were instructed to list all the adjectives that they encountered while reading a prototype coaching e-book that was set out in front of them. Where attainment grouping was observed this was carried out to facilitate the type of tasks that the other small groups were carrying out around the e-book users. The small groups would rotate through activities each day so that all pupils got a chance to use the prototype coaching e-book, although it was observed that pupils who struggled with reading also struggled with accessing the e-book and the e-book system and therefore needed more adult support.

3.2.3 Large group (teacher-led use) and small group (individual pupil use)

In one Year 1 class, the teacher was observed to divide the class into three groups with one large group that were asked to remain seated on a shared carpet. For the other two groups (about six to eight pupils in each group), one read a book with a teaching assistant and the other read a prototype coaching e-book using laptops (where they needed assistance logging in to the prototype e-book). Further, although these pupils were provided with headphones, these often did not work due to difficulties with the laptop. Generally, these laptops were observed to be sluggish while loading the prototype coaching e-book. In fact, they proved so slow that three pupils ended up having to partner up with other pupils – which has implications for the practicality of achieving independent reading by each pupil. The teacher meanwhile was also reading the prototype coaching e-book off the main class board with the large group that had remained seated on the shared carpet. The teacher would use the coaching buddy to prompt the pupils to reflect on the questions. The pupils seemed fully engaged and excited with the e-books when they were used in this manner. For the final five minutes of this class, these pupils were then asked to complete a written task linked to a book from the prototype coaching e-books that they had been provided with by OUP.

Regardless of the approach that was used in the implementation of the prototype coaching e-books (individually, in pairs or with a teacher), it was also observed that all the Year 1 pupils who used the e-books also used the **coaching buddy feature** (i.e. used the questions that pupils had to click on throughout the text to guide their thinking about the text) (see Section 1). Once a pupil had logged into the prototype coaching e-books, they were commonly observed to be completely immersed in the story. However, this was less apparent with the Year 5 pupils, where a greater variation of engagement was observed. While some pupils were observed to be immersed in the reading and engaging with the coaching tools, others were observed simply clicking through the pages of the e-books and others were distracted with external events as one might expect.

3.3 Teachers' views of the prototype coaching e-books

Research Question 3: *What benefits and/or challenges can be experienced by primary schools and Year 1 and Year 5 teachers when implementing and using the prototype coaching e-books?*

3.3.1 Perceived benefits of implementing the prototype coaching e-books for teachers, schools, and pupils

After one term's use of the prototype coaching e-books, teachers were unanimous that their pupils had both engaged with and enjoyed the prototype coaching e-books.

> *"The children liked it. They absolutely loved all the stories. The children liked to listen to it. They were really upset when I didn't have time, or the laptops broke down, and that happened twice. They were really disappointed. They were engaged with the stories."* School 3, Year 1 teacher

> *"It is really useful especially with my higher order children because you need some IT skills. It is not the end-all and be-all because we can help set things up, but they are able to log on independently. They are then able to read the books independently. They have earphones and they can use that if they want to listen to the book independently. I have left that up to them. I gave them the option of either listening to the book or reading it themselves. They*

> *have had a go at answering the questions. I think that would be really useful if we develop it more next year."* School 1, Year 1 teacher

> *"The children will get engaged with higher order thinking questions. But I think that the benefits would be greater up higher in the school. If they start using it in Year 1, then they will have it in their system. It is more that in Year 2 and 3 they will be really able to use the reading buddy fully and getting them to write their responses to the questions. The children have really enjoyed the books. They are visual and colourful."* School 2, Year 1 teacher

> *"The students were engaged in it. They really enjoyed it."* School 3, Year 5 teacher

As a result of this engagement and enjoyment, teachers then commented that the use of the prototype coaching e-books had a benefit beyond pupils – they also helped to foster a love of reading within the broader school community. The possibility of such secondary benefits was also noted due to links between reading, writing, and improved vocabularies – this despite reading not being given as much time as other subject areas during the schedule of a typical school day.

> *"Reading is within English and phonics which is about two hours. However, the focus on the inference, the prediction and the deduction; all of those skills is quite limited I think. The time to do this would help."* School 2, Year 1 teacher

> *"But their engagement with reading and attitude towards guided reading lessons are quite different. We only have 45 minutes as opposed to an hour and a half for English and maths, so they know it is less important. To begin with, it wasn't linked to their English, so they begrudged reading time. They take English and maths more seriously because they know it is more important. As the year went on it has changed a lot. They have seen the relevance a lot more. We made the English and guided reading more linked. Everything they write about in their guided reading they can use in their English. As a whole school we introduced [competitor product named] vocabulary, which is words they can pick up from their text and they would be rewarded if they use it in their writing."* School 1, Year 5 teacher

> *"If children have a love of reading and language, they are generally good writers as well. The ones that do not read find it difficult to write. For example, the two who have not met expectations in reading, have not met expectation in writing either."* School 1, Year 1 teacher

When interviewed in July, teachers were also of the opinion that the coaching buddy questions had helped pupils to reflect upon their reading and to engage in higher order thinking skills and that the pupils saw the benefit of the prototype e-books featuring comprehension quizzes at the end. They commented that any tool that can be linked with assessment and tied in with their learning objectives can essentially do two jobs at once: engage pupils in reading while communicating with the teacher whether a pupil has met the learning objective. However, one teacher also noted that the quizzes at the end of the book need not *necessarily* reflect reading comprehension so much as language comprehension due to the option for pupils to hear the story being read to them.

> *"I would say the quizzes: the interactive quizzes because it is not just questions. [Competitor product named] had questions, but with the Reading Buddy it had the additional: 'What about this? Have you thought about…?' I have noticed some children engaging in that and talking it through with themselves."* School 2, Year 1 teacher

> *"It is hard however because you cannot judge how much they can read or not. You can get their comprehension, but if I let them read all buddy all the time, I can't tell if they can read on their own or they are relying on the buddy to read to them. In Year 1, that is where they pick up reading. They have to learn blending and de-coding, and if the book is read to them, then that whole skill is missed. It is good they can switch off the sound but doing the quiz would not show if they have read or listened to it."* School 3, Year 1 teacher

Finally, the prototype coaching e-books were seen by teachers as a potential link between the school and home. If parents were to use the prototype coaching e-book at home with their children then this was seen as another means of reinforcing a love of reading amongst the pupils.

> *"I think it will be really good for my challenging pupils. They like laptops and computers. For them to access it at home will be a massive benefit. I think they will be able to sit down and listen to it. Even if it is just listening to it to start with. That will be a massive accomplishment."* School 1, Year 1 teacher

3.3.2 Perceived challenges of implementing the prototype coaching e-books for teachers, schools, and pupils

The main concern expressed by teachers had nothing to do with the prototype coaching e-books (or the prototype coaching e-book system) themselves. Instead, teachers were primarily concerned with the lack of suitable IT resources in schools and how this constrained their ability to make best use of the prototype coaching e-books. None of the schools participating in this evaluation had an ICT suite, and no classroom had its own set of tablets or laptops. Instead, the schools commonly had a set of tablet computers that were too few in number to permit individual use by a whole class, or schools had one set of laptops to share amongst all pupils in the school and frequently these did not function properly.

> *"Our laptops are shocking. I tried to set up four: in an hour, they had not even loaded."* School 3, Year 1 teacher

> *"In our class, we have five laptops and five tablets. If we pull them from the other classes, then we have enough for children to access it."* School 2, Year 5 teacher

In classes where the laptops were not functioning properly, the teachers and pupils expressed frustration with slow laptops. Not only were they frustrated, but it meant that time actually spent on the reading activity was cut down significantly which, in the opinion of the interviewed teachers, risked rendering the whole activity worthless. It was also common for teachers to state (independently from one another) that due to limited presence of functioning IT equipment within their schools they would not be able to take full advantage of the *Oxford Reading Buddy* once it was launched. Furthermore, classrooms commonly lacked sufficient power outlets to charge all devices if they required it (especially the case for the one school where the batteries in laptops no longer functioned). Moving forward, teachers expressed that they would need to timetable use of laptops if they were to use the prototype coaching e-books (or the broader *Oxford Reading Buddy*) in the future.

> *"To be honest, the logistics of using it was a nightmare. The laptops would take ages to load."* School 3, Year 5 teacher

> *"Our main problem is facilities. Like you have seen: our laptops are terrible. It would be much better if we had an ICT suite and we could go and we could do our reading session there. We are a massive school now. There are 18 classes: one set of laptops here and one upstairs. None of those have any batteries. We are all using the one set that is upstairs."* School 3, Year 1 teacher

> *"We had to use the laptops to access the prototype coaching e-books and they are not available all the time. However, we could plan for that next year."* School 1, Year 1 teacher

Considering challenges beyond IT resources, teachers were also concerned with how difficult it was for some pupils to access the prototype coaching e-books, particularly entering logins and passwords. Their previous experience with similar digital services had already made them wary of this issue prior to the implementation of the prototype coaching e-books because pupils commonly forget their logins and passwords. This was also the case during this evaluation, where forgotten usernames and passwords became a burden on teachers' time. Teachers also felt that Year 1 pupils might have issues logging in simply because of their young age and inability to navigate electronic devices properly – something confirmed during the observations of lessons within which pupils used the prototype coaching e-books. Two of the Year 1 teachers adapted to this problem by having either laptops or tablets[18] prepared ready with logins and passwords entered for pupils in advance of their use, while the third (of three) Year 1 teacher had her teaching assistant help the pupils enter the logins and passwords. Reflecting upon this problem during the July interviews, Year 1 teachers asserted that although it would be an issue moving forward it would also encourage good practice. Through modelling, teachers believed that pupils in Year 1 should be able to successfully log in independently to the prototype coaching e-book through repeated practice.

> *"That is the problem in Year 1: it is getting them used to using it. It is hard because they have got their own emails* [synonymous with usernames] *and their own passwords. They don't really retain the information. It is managing when to use it and how to use it. For the lower end of my class, even if you put the passwords out for them to copy, they wouldn't be able to do it. The higher end, yes, you could put the iPads out. I would still have to type out the email addresses for them, but they would be able to put the passwords in themselves and they can navigate independently."* School 2, Year 1 teacher

Teachers, especially those in Year 5, were also worried that pupils might misuse time spent in class that was dedicated to reading the prototype coaching e-books. Again this was confirmed through the lesson observations, where some Year 5 pupils were observed getting restless and not focusing on reading the prototype coaching e-book or interacting with the buddy activities or questions. However, the Year 1 pupils who were using the prototype coaching e-books independently were seen to be more engaged with the reading, with some pupils even observed to read the book out loud to themselves. The possible reason for this difference between the two year groups was speculated upon by two Year 5 teachers. They commented that the relative lack of engagement commonly seen by the Year 5 pupils could be due to their being extrinsically motivated towards learning activities, including reading – a feature lacking from the OUP prototype coaching e-books.

[18] Note that a mix of laptops and tablets in literacy lessons was not observed in this evaluation; it was one or the other.

The teachers suggested that if the post prototype coaching e-books had a reward system then this could possibly engage pupils to a greater extent.

> *"To be honest, I think the excitement for my children is that they go on the prototype coaching e-books rather than reading an actual book."* School 1, Year 5 teacher

> *"The only challenge I was thinking of are the pop-ups. I asked if they pop up on their own, or do the children have to click on it. We see that with [competitor product named]; they are happy to read through the book, but they don't necessarily click on the questions unless you physically sit with them. If, like [the OUP contact to the schools participating in this evaluation] was saying, that this is designed for them to do on their own, I can see a lot of mine clicking through, and then say they had done it instead of clicking and using the Reading Buddy to help them. It could happen; it will need some training. I did say that the reason I like 'Bug Club' is that they have questions throughout the book, but you would have to click on the symbol for the question to come up. I did say it would be nice if the questions popped up, so they would have to interact with it: it is not a choice. With mine, they are good readers at their levels. It is the comprehension side that we want to focus on and getting those questioning. With 'Bug Club', they don't want to do it. They just want to read the book."* School 2, Year 1 teacher

The limited numbers of the prototype coaching e-books that were supplied to schools (seven: four in Year 1; three in Year 5) was mentioned by the teachers as a reason why they spent limited time using the prototype coaching e-books in class during the 2017/18 summer term. The pupils, especially those with stronger reading skills, were able to read the prototype coaching e-books and complete the associated activities quickly. Consequently, implementing the prototype coaching e-books in class towards the end of the academic year was seen as disruptive and an add-on. As a result, two teachers expressed concerns with using the prototype coaching e-books whilst also having to catch up with the other classes because the use of prototype coaching e-books was not embedded into the structure of their planning and the time allocated for reading in class is limited.

> *"They got through the limited number of texts quite quickly; some of them got through them in one session. Once they were done with the text, then there was not much they could do with it really."* School 3, Year 5 teacher

> *"At the moment I am doing it alongside what everyone else is doing. I still have to do the other objectives set for Year 1. I will have one group on the prototype coaching e-books and they will miss out and I then have to help them catch up later."* School 1, Year 1 teacher

> *"If they could look at objectives within year groups and signpost the books that will cover those objectives that would certainly be useful. A hundred per cent of the objectives have to be met for each year group. If there is some link which takes us to the teacher's objectives, for example: this section will support these objectives in your unit of work: I think that will be pivotal. If I knew that Oxford can cover that objective and it was then linked to a teacher's account and it gave me an outcome for that child that they answered these questions well, then that would feed into the objectives I have to track in pupil tracker. It will give me the evidence. That would be really clever and a massive step up in terms of competition."* School 2, Year 5 teacher

A further area of concern was the level of differentiation that was present within the prototype coaching e-books. Although teachers were aware that during this evaluation the number of e-books was limited (hence also the choice of book), teachers nonetheless raised concerns for the future. They were concerned that any service moving forward (i.e. *Oxford Reading Buddy*) should not only be accessible for those who struggle with reading and second language learners (bearing in mind cultural differences), but also that the service should also be able to push avid readers to widen their horizons with a broader choice of books and authors to read from. Teachers believed that the prototype coaching e-books only served pupils with age-expected reading skills and not their peers who either struggle with reading, have particularly strong reading skills (who would benefit from fewer reading buddy questions), or who are learning English as an additional language.

> *"I have a child who speaks no English, he does not understand the books. That will be an issue every year where you have children who come to school and can't speak any English."* School 1, Year 5 teacher

> *"The story with the seagull, on the scene in the beginning, it labels the seagull and all those little things, but it does not mean anything for children who are second language learners. I have a large percentage of Polish children and those words don't mean anything unless they are linked to the picture. Where it says seagull, it meant nothing to the children. So, if there is a way for where it says 'seagull' for a seagull to actually flash by, that would be really useful. A way to make it more visual."* School 3, Year 1 teacher

> *"Just as long as the books there are useful. If it is levelled in some way where more able children are able to access a higher level. I think if there is some way where the child can choose the avenue they take and guide their own learning. For example, we have some really high attaining girls who we are trying to push to widen their horizon with regards to choice of author to bring in that rich language because they are so ready. So, if we can push them through an* Oxford Reading Buddy*, then we could push them to the right books. It might naturally do that through the programme."* School 2, Year 5 teacher

> *"When the buddy comes up, or there is a question, sometimes it answers the question before the children can give the answer. Sometimes, the buddy almost puts the idea into their heads. So, it is almost an easy way out and does not challenge the more 'sparky' ones."* School 3, Year 1 teacher

While the prototype coaching e-books were viewed by teachers as a tool that could better link reading in schools to reading in homes, teachers also raised possible challenges in this. A few teachers commented that the majority of pupils' parents did not support reading at home and (perhaps unsurprisingly) that these were also the pupils who teachers consider to have greatest need of support with their reading. However, one teacher mentioned that this could be resolved if their school where to react proactively by reaching out to these pupils by providing access to the prototype coaching e-books during school lunch times or after school to ensure they get reading time to help improve their language and vocabulary.

> *"Certainly, the type of parents we have here is a challenge. Especially for those children we need to get to, we need to show their parents how they are supported. There are some complications with regards to the access. But that is for us a school to figure out where these*

> *problems lie and for us to provide the right time for the children, whether it is at lunch time or an after-school club where they can access such tools."* School 2, Year 5 teacher

> *"I sent a letter home to parents and I have had a couple of parents who have recorded in their reading log that they have read the buddy books. That is good, but they were only a couple. Literally, three out of thirty."* School 3, Year 1 teacher

Research Question 4: *What possible impacts on schools, lessons, and pupil outcomes do Year 1 and Year 5 teachers perceive from using the prototype coaching e-books?*

When interviewed in March, before the prototype coaching e-books had been used, teachers discussed what impacts they anticipated for themselves, their school, and their pupils because of implementing the prototype coaching e-books. Teachers were unanimous that the potential for impact would come from the opportunity for their pupils to engage in greater amounts of guided reading.

> *"It would be nice with the Digital Reading Buddy, that they would have more opportunities to have more guided reading. To have them [pupils] reading more than once a week. They can be guided through with the Reading Buddy more times if they want to. Even if it is the case of going through them during goal time, we can get the laptops out, so they can choose to read. Because they like being read to, but we don't have time to have more than one session where they actually get guided reading."* School 3, Year 1 teacher

When teachers were questioned as to why they considered the potential impact of the e-books to be achieved via greater guided reading, teachers highlighted that the coaching element of the books may complement and extend the adult-led guided reading with physical books that was already taking place in classrooms and homes.

> *"I think we do need more adults (TA or LSA) so the children can read to an adult at least twice a week."* School 2, Year 1 teacher

> *"Books will still be sent home, but it will be a lot easier if there are copies of books that are online."* School 3, Year 1 teacher

Furthermore, when interviewed in March, teachers in both Year 1 and Year 5 anticipated that their implementation and use of the prototype coaching e-books would have a positive impact upon pupils' engagement with reading because the prototype e-books combined reading with the use of technology (laptops or tablets).

> *"That will get them quiet: as soon as you get the tablets or laptops out, then they are glued to it. I will get them out to do that so they get a chance to do it independently."* School 2, Year 1 teacher

> *"They absolutely love working with tablets and laptops. I think it will engage them."* School 3, Year 5 teacher

One Year 5 teacher also expressed excitement about implementing the prototype coaching e-books due to the embedded quiz questions. She explained that these had the potential for positive impacts

for her as a teacher and also for her school by helping to prepare the Year 5 pupils for SAT-type questions that they would encounter once they were in Year 6.

> *"I think it would be useful in preparing children for SATs for Year 6 because you can see the sort of questions they are struggling with."* School 1, Year 5 teacher

However, after using the prototype coaching e-book, a different Year 5 teacher observed that the quiz questions in the prototype coaching e-books could be made more similar in format to the SAT questions that their pupils would be engaging with a year later.

> *"The only thing that I could see was that when they did the quiz, it did not reference page numbers whereas in SATs, they do. Year 5 and 6 have quite a lot of text to skim and scan through. For them not to reference a page number or to look at this paragraph, then they relied on their memory because they did not want to go through the entire book to find the answer. If they referenced a page number, they would look at the page. But to go through the entire text, they wouldn't do it."* School 3, Year 5 teacher

It is also important to note that these anticipated impacts (via guided reading, engagement with reading, and SAT question preparation) were complemented by additional secondary impacts that that teachers reported upon *after* they and their pupils had used the prototype coaching e-books. Secondary benefits were noted for the school community by fostering a love of reading, for teachers via the quiz questions helping them to check on whether learning objectives are met, and for pupils via the opportunity to read the e-books at home as well as in school (see Section 3.3.1).

4. Conclusions and Next Steps

4.1 Key findings

- The prototype coaching e-books can help promote improved attitudes to reading in primary school pupils
    - We found significantly improved attitudes to reading in pupils whose classes had used the prototype coaching e-books in the summer term 2017/18
    - Further analyses showed that this boost to reading attitudes was much more apparent in the Year 5 pupils – pupils who otherwise showed a slight decline in their attitude to reading during this final term of the school year

- Teachers were observed to implement the prototype coaching e-books in three ways:
    - With their whole class and with individual use by each pupil – often in Year 5
    - With a small group of pupils who accessed their own e-books – often in Year 1
    - Blended use: a large teacher-led group who engaged in a single e-book projected on a whiteboard, plus a small group who accessed their own e-books – only in Year 1

- Common benefits that were identified by teachers included:
    - The prototype coaching e-books helped to engage pupils with reading by integrating reading with ICT
    - Pupils enjoyed reading the e-books, with this helping to foster a love of reading
    - The prototype coaching e-books have potential to further bridge reading at school with reading at home (this being a feature of *Oxford Reading Buddy* that was not tested in this evaluation)

- Common challenges that were identified by teachers included:
    - A limited capacity to make full use of the prototype coaching e-books due to:
        - Insufficient school ICT resources
        - Time constraints
    - A difficulty for some Year 1 pupils to easily access the prototype coaching e-books due to forgetting usernames, passwords, and not yet possessing sufficient skills in ICT
    - A limited capability for the prototype coaching e-books to address the interests and needs of all pupils due to a lack of content that could:
        - Keep reluctant readers engaged and motivated. This being the purpose of the motivation badges in the full *Oxford Reading Buddy* service
        - Suitably scaffold pupils who were either struggling with reading or who were showing strong reading skills. This being the purpose of the library of e-books mapped onto all reading levels within the full *Oxford Reading Buddy* service

- In the context of such challenges, it is perhaps unsurprising that we also observed fewer teaching practices that are known to be effective taking place in the literacy lessons within which the prototype coaching e-books were being used.

4.2 Key findings in the context of past research

The results from this evaluation are at times in keeping with yet also challenge the findings from past research regarding the use of e-books as well as their potential impacts. That the use of the prototype coaching e-books was linked to improved attitudes to reading in Year 5 pupils is one of the findings that is in keeping with past research (e.g. Picton, 2014). Another finding that is in keeping with past research is the concerns raised by teachers about the risks to reading comprehension should pupils substitute the text-to-speech auditory component of the e-books for their own reading (Miller & Warschauer, 2014; Karemaker, Jelley, Clancy & Sylva, 2017). Finally, there are still many questions yet unasked and unanswered as they lie outside the remit of this evaluation. As a result, there still remains much that can be learned about the various processes that underlie how pupils engage with the coaching e-books plus what long-term outcomes from this engagement might be expected. However, these are also the same areas for investigation faced by the broader research community given the relative recency of the current 'tablet era' of reading (Miller & Warschauer, 2014; Karemaker, Jelley, Clancy & Sylva, 2017; Neumann, Finger & Neumann, 2017; Roskos, Brueck & Lenhart, 2017).

The findings from this evaluation also reflect upon the various 'digital divides' that individuals can experience in today's tablet era of reading. While the literature reviews provided in Section 1 stressed that access to digital devices is now so common that the digital divide has shifted from difficulties *accessing these devices* to difficulties *with their use*, this was not a conclusion that could be drawn on behalf of the schools that participated in this evaluation. Instead, the schools and teachers in this evaluation were confronted with the traditional digital divide: quite simply there was often a lack of sufficiently reliable electronic devices for teachers to easily employ within their literacy lessons. Devices could be insufficient in number for a whole class of pupils to each use their own, unavailable (e.g. in use by another class), non-functional, or only partly functioning to the extent that lessons could be disrupted (e.g. laptops that required a constant supply of mains electricity). This we speculate is likely to be one of the key reasons why we observed fewer effective teaching practices during our observations of literacy lessons in these classrooms – particularly as these difficulties limited the time that could be spent on planned literacy activities (see Section 3.2.2).

Finally, the association that was found between the use of the prototype coaching e-books in literacy lessons and an increase in Year 5 pupils' attitudes towards reading coincides with two other differences that are commonly observed when comparing pupils in Year 5 against those in Year 1. First, negative attitudes to reading in Year 5 can be traced back to difficulties with reading that are experienced when in Year 1 (Crampton & Hall, 2017). Second, by Year 5 (rising age 10 years in the UK), pupils are commonly shifting from 'learning to read' (acquiring decoding and fluency) to 'reading to learn' (Miller & Warchsauer, 2014). As a result, a boost to the reading attitudes of Year 5 pupils may serve to partially offset one consequence of reading difficulties at an earlier age and the boost to pupils' reading attitudes may have positive consequences for the extent (and quality) of reading that they engage with within other school subject areas in future years.

4.3 The strengths and limitations of this evaluation

The core strength of this evaluation is that its research design was highly appropriate for answering its research aims and questions. It used an RCT design to maximize the rigour of the evidence collected concerning potential impacts (Research Question 1) yet also gathered multiple types of

information from pupils, teachers, and observations of literacy lessons to provide a full account of the various ways that teachers implemented the prototype coaching e-books (Research Questions 2–4). The RCT element was particularly rigorous in its capacity to produce sound evidence regarding possible impact because it took advantage of the similarity of whole classrooms of pupils within the same school and school year to better balance the backgrounds of the pupils in the two experimental groups. The backgrounds of the average pupil from two classrooms within the same school and school year are likely to be more similar than are the backgrounds of the average pupil from the same school year, but from different schools (which are likely to serve different communities).

The core limitation of this evaluation lies in its limited scope. Although this scope was appropriate for an upstream (pilot) evaluation, it limited the extent of the claims that could be drawn. Considering the limited scope in detail: the evaluation was only of *prototype* versions of the coaching e-books (and e-book system) that are just one component of the (at the time) forthcoming *Oxford Reading Buddy* service. Further, the evaluation considered use of the prototype coaching e-books only in schools (not in pupils' homes), worked with only a small number of primary schools (three) that were drawn from a small geographical area (the south of England) and followed the teachers and pupils for only a single school term (summer 2017/18). As such, the claims of the evaluation concern *possible* impacts and provide accounts of the ways that schools and teachers *can* implement the prototype coaching e-books. Nonetheless, such evidence of possible impact and implementation constituted novel knowledge at the time, knowledge that was fed back to OUP via monthly meetings (April–July 2018) in order to contribute to the development of the *Oxford Reading Buddy* service.

4.4 Practical implications for schools and teachers

From this upstream evaluation of the prototype coaching e-books that will subsequently form part of the *Oxford Reading Buddy* service come a number of implications for both schools and teachers. First, the difficulties that the Year 1 pupils experienced accessing the prototype coaching e-books is in keeping with other studies (e.g. Neumann, 2018) and suggests the need for schools and teachers to provide greater scaffolding (in both time and adult support) with regards to this practical aspect of the use of e-books. However, and as one teacher commented in this evaluation, this need not be viewed as time that is wasted, but as an opportunity to develop a range of skills in other areas at the same time. For example, ICT skills, fine motor skills, and self-regulatory skills.

Second, the findings from the evaluation stress both the importance of buy-in to digital reading services by school leadership and teachers plus areas where this buy-in needs to manifest. From speaking to teachers and observing literacy lessons in which the prototype coaching e-books were used, their successful use was seen to depend upon: the presence of sufficient reliable electronic devices, sufficient time allocated to reading in lessons, sufficient time allocated to learning the capabilities of such electronic services, and sufficient time allocated for the development of revised lesson plans that can fully exploit the benefits offered from such technology (e.g. as regards pupil motivation and reading attitudes).

4.5 Recommendations for OUP

An implicit feature of upstream evaluations is that they are able to make recommendations that have the potential to affect the development of that which is being evaluated. In this case, recommendations can be made towards both the coaching e-books that will feature within the (at the time of writing unlaunched) *Oxford Reading Buddy* service as well as towards the whole *Oxford Reading Buddy* service itself. First, it may benefit OUP to reflect upon who the primary intended purchasers are for the *Oxford Reading Buddy* service: is it schools or is it schools plus parents? Furthermore, if both, then will the same product be created, marketed, and supported to both schools and parents or is there scope for two products that differ? For example, the features that parents may desire for a 'parent-version' might be quite different to those for a 'teacher-version'. For example, teachers in this evaluation wished to see quiz questions at the end of the prototype e-books that were tailored to SAT questions in Years 2 and 6 and they desired the ability to disable the audio track on the e-books (to better ensure benefits to reading comprehension and not just comprehension of the English language). The evaluation is not in a position to comment on whether or not parents share similar opinions or have opinions unique to themselves.

Second, to what extent do OUP wish to specify how schools and teachers use this service? Past discussions with the OUP team that managed and supported this evaluation revealed that teachers can vary strongly in the extent to which they prefer its use to be specified by OUP (from highly specified to not specified at all). In turn, this fosters a tension in the development of the *Oxford Reading Buddy* service. Fortunately, the suggestions given by the teachers in this evaluation may constitute new possibilities for the support of schools and teachers that overcome the tension between use that is either highly specified or highly unspecified. The teachers in this evaluation suggested that greater support could be provided by OUP in the form of: 1. exposure to how other classes or teachers have used or are using the prototype coaching e-books, and 2. the creation of a teacher FAQ database that could answer teachers' possible questions. The first of these, the provision of a range of models of usage that are employed by other teachers and schools, has the potential to help all teachers develop bespoke lesson plans that integrate the *Oxford Reading Buddy* system into literacy lessons – regardless of whether the teacher prefers a greater or lesser degree of specified usage. The vignettes of common usage that were provided to teachers in this upstream evaluation (Appendix 10) would be a starting point towards developing such support, as would the 'free professional development videos'. Inter-school visitations would be another option.

A third area of recommendation for OUP concerns the merit of, and options for, replicating and extending this evaluation. Beginning with the merits of replicating and extending this upstream evaluation, these follow-on from its limitations (see Section 4.3): the scope of this research was limited to just the prototype coaching e-books that are just one part of the larger *Oxford Reading Buddy* service. Further, this upstream evaluation only considered use in primary schools in England, and only considered use during one term. As a result, there are questions yet unasked for which the answers may be valuable for different areas of OUP. Such unasked questions include:

- *What are the impacts and challenges associated with schools implementing the* Oxford Reading Buddy *service?*
- *What are the impacts and challenges associated with implementing the* Oxford Reading Buddy *simultaneously with schools/teachers plus also the parents of pupils?*

- *Can use of the* Oxford Reading Buddy *service achieve detectable impacts upon pupils' reading skills (e.g. comprehension)?*
    - It would seem particularly valuable to OUP to be able to identify impacts upon national assessments of reading attainment
- *Can use of the* Oxford Reading Buddy *constitute an effective reading intervention for pupils who are reluctant readers and/or who are struggling to meet age-related reading expectations?*
    - This being a question that is also informed by past research (see Section 1.2)
- *How do the impacts and challenges associated with schools and/or parents implementing the* Oxford Reading Buddy *vary across the various (and international) educational systems where its use is intended?*

Considering next the options that OUP may wish to explore in pursuing answers to these questions, these include:

- Internal (OUP) and/or commissioned evaluations. If the former, then smaller-scale commissioning may still prove beneficial in the form of research consultancies. For example, to aid in the design of an evaluation, to aid in the testing of child outcomes, or to aid in the analysis of numeric data gathered by an evaluation team
    - Externally commissioned independent evaluations are higher-cost and higher-stakes, but they also offer the potential for greater impact upon external audiences (including schools, teachers, and parents)
- Evaluations that track implementation and possible impacts for a period longer than one school term. This need not be an onerous task. For example, implementation may be tracked for one school year with impacts investigated by comparing results on national pupil assessments to age-equivalent national assessments from the previous year
- Evaluations that unpick ways in which the reading library that accompanies the *Oxford Reading Buddy* service can be better used in respect to differences between pupils' backgrounds, for example backgrounds that vary across cultures and variations between pupils that prompt the use of e-books from age-unexpected Oxford Reading Levels. Both were observed in this evaluation of the prototype coaching e-books. One pupil had no conception of a seagull while other pupils struggled with the e-books due either to speaking English as a newly acquired additional language or to having particularly advanced reading skills for their age.

References

Barber, P. & Houssart, J. (2011). Consulting pupils about mathematics: a straightforward questionnaire? In Smith, C. (Ed). *Proceedings of the British Society for Research into Learning Mathematics, 31*(1).

Borman, G. D., Gamoran, A. & Bowdon, J. (2008). A randomized trial of teacher development in elementary science: First-year achievement effects. *Journal of Research on Educational Effectiveness, 1*(4), 237–264. https://doi.org/10.1080/19345740802328273

Bus, A. G., Takacs, Z. K. & Kegel, C. A. (2015). Affordances and limitations of electronic storybooks for young children's emergent literacy. *Developmental Review, 35*, 79–97. https://doi.org/10.1016/j.dr.2014.12.004

Clark, C. (2013). *Children's and young people's reading in 2012. Findings from the 2012 National Literacy Trust's annual survey.* National Literacy Trust. Retrieved August 06 2018 from https://literacytrust.org.uk/documents/152/2013_04_11_free_research_-_childrens_and_young_peoples_reading_in_2012_cyEveGL.pdf

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum

Crampton, A. & Hall, J. (2017). Unpacking socioeconomic risks for reading and academic self-concept in primary school: Differential effects and the role of the preschool home learning environment. *British Journal of Educational Psychology, 87*(3), 365–382 https://doi.org/0.1111/bjep.12154

Elliot, K. & Sammons, P. (2004). Exploring the use of effect sizes to evaluate the impact of different influences on child outcomes: Possibilities and limitations. In Schager, I. and Elliot, K. (Eds.), *But what does it mean? The use of effect sizes in educational research*. London: National Foundation for Educational Research, 6–24

Guthrie, J., McGough, K. & Wigfield, A. (1994). *Measuring reading activity: An inventory* (Instructional Resource No. 4). Athens, GA: National Reading Research Center

Hall, J., Lindorff, A. & Sammons, P. (2016). *Evaluation of the impact and implementation of Inspire Maths in year 1 classrooms in England: Research report.* Oxford: Oxford University Press

Hannover Research Group. (2014). *Best practices for school improvement planning*. Washington DC: Authors. Retrieved August 06 2018 from http://www.hanoverresearch.com/media/Best-Practices-for-School-Improvement-Planning1.pdf

Karemaker, A., Jelley, F., Clancy, C. & Sylva, K. (2017). The effects on children's literacy skills of reading e-books with different features: Are 'bells and whistles' over-rated? *International Journal of Child-Computer Interaction, 12,* 20–36. https://doi.org/10.1016/j.ijcci.2017.01.004

Louden, W., Rohl. M & Hopkins, S. (2008). *Teaching for growth: Effective teaching of literacy and numeracy.* Department of Education and Training, Western Australia

Miller, E. B. & Warschauer, M. (2014). Young children and e-reading: research to date and questions for the future. *Learning, Media and Technology, 39*(3), 283–305. https://doi.org/10.1080/17439884.2013.867868

Neumann, M. M. (2018). Using tablets and apps to enhance emergent literacy skills in young children. *Early Childhood Research Quarterly, 42*, 239–246. https://doi.org/10.1016/j.ecresq.2017.10.006

Neumann, M. M., Finger, G. & Neumann, D. L. (2017). A conceptual framework for emergent digital literacy. *Early Childhood Education Journal, 45*(4), 471–479. https://doi.org/10.1007/s10643-016-0792-z

Picton, I. (2014). *The impact of ebooks on the reading motivation and reading skills of children and young people: A rapid literature review*. London: National Literacy Trust

Puffer, S., Torgerson, D. J. & Watson, J. (2005). Cluster randomized controlled trials. *Journal of evaluation in clinical practice, 11*(5), 479–483. https://doi.org/10.1111/j.1365-2753.2005.00568.x

Roskos, K., Brueck, J. & Lenhart, L. (2017). An analysis of e-book learning platforms: Affordances, architecture, functionality and analytics. *International Journal of Child-Computer Interaction, 12*, 37–45. https://doi.org/10.1016/j.ijcci.2017.01.003

Sammons, P., Kington, A., Lindorff A. & Ortega, L. (2014). *Inspiring teachers: Perspectives and practices.* London: CfBT Education Trust.

Savage, R., Abrami, P. C., Piquette, N., Wood, E., Deleveaux, G., Sanghera-Sidhu, S. & Burgos, G. (2013). A (pan-Canadian) cluster randomized control effectiveness trial of the ABRACADABRA web-based literacy program. *Journal of Educational Psychology, 105*(2), 310. https://doi.org/10.3389/fpsyg.2014.01413

Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of Cronbach's alpha. *Psychometrika, 74*(1), 107. https://doi.org/10.1007/s11336-008-9101-0

Sullivan, G.M. (2011). Getting off the "Gold Standard": Randomized Controlled Trials and education research. *Journal of Graduate Medical Education*, *3*(3), 285–289. https://doi.org/10.4300/JGME-D-11-00147.1

Wigfield, A. & Guthrie, J.T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology, 89*, 420–432. https://doi/org/10.1037/0022-0663.89.3.420

Appendices

1. Dates of data collection during the RCT

[School ID]–[Teacher ID]	Questionnaire 1	Interview 1	Observation 1	Observation 2	Interview 2	Questionnaire 2
S1-T1	Wednesday March 28	Wednesday May 2	Tuesday May 15	Tuesday July 11	Wednesday July 11	Monday July 2
S1-T2	Wednesday March 28	Wednesday May 2	Tuesday May 15	Wednesday July 4	Wednesday July 11	Wednesday July 11
S1-T3	Wednesday March 28	Wednesday May 2	Tuesday May 15	Thursday June 28	Wednesday July 11	Wednesday July 11
S1-T4	Wednesday March 28	Wednesday May 2	Tuesday June 19	Friday June 29	Wednesday July 11	Wednesday July 11
S2-T1	Tuesday March 27	Friday April 27	Monday May 14	Monday June 4	Thursday July 5	Monday July 9
S2-T2	Tuesday March 27	Tuesday April 17	Monday May 14	Monday June 18	Monday July 9	Monday July 9
S2-T3	Tuesday March 27	Tuesday April 17	Monday May 22	Wednesday June 20	Monday June 9	Friday July 13
S2-T4	Tuesday March 27	Tuesday April 17	Friday May 11	Friday July 22	Monday July 9	Friday July 13
S3-T1	Tuesday March 27	Friday April 27	Friday May 18	Monday June 18	Wednesday July 18	Wednesday July 18
S3-T2	Tuesday March 27	Friday April 27	Friday May 18	Monday June 18	Wednesday July 18	Wednesday July 18
S3-T3	Tuesday March 27	Friday April 27	Wednesday May 23	Monday June 18	Thursday July 19	Wednesday July 18
S3-T4	Tuesday March 27	Friday April 27	Wednesday May 23	Monday June 18	Thursday July 19	Wednesday July 18

2. Questionnaire items used to assess pupil attitudes to reading

Suggested description to Year 1 pupils
[Show the next page to the whole class.] These pictures of faces show different feelings.

[Point to the first picture at the top on the left.] This face looks "very happy".

[Move your finger right to the next picture.] How has this face changed? This face looks "a little happy".

[Move your finger right to the third picture.] This face looks "a little sad".

[Move your finger right, to the last picture.] What about this face? This face looks "very upset".

I will read some statements that ask you how you feel. Each statement has its own colour. I want you to look at the four faces for each colour, then put a cross on the face that is closest to YOUR feelings.

Remember, there are no right or wrong answers!

Let's start with two practice questions.

Suggested description to Year 5 pupils
I will read some statements that ask you how you feel about reading. There will be four faces that indicate different feelings.

[Show the next page to the whole class. Point to the first picture at the top on the left.] This face looks "very happy".

[Move your finger right to the next picture.] This face looks "a little happy".

[Move your finger right to the third picture.] This face looks "a little sad".

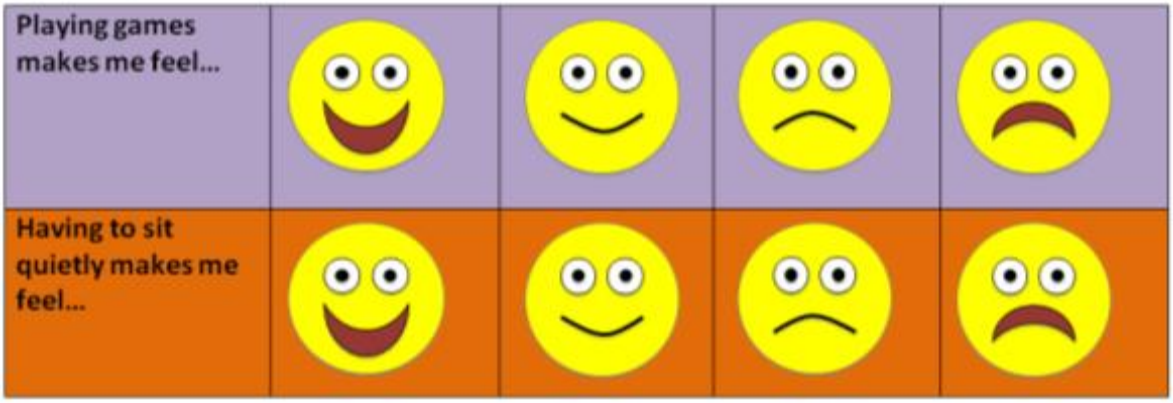
[Move your finger right, to the last picture.] This face looks "very upset".

For each statement that I read out, I would like you to put a cross on the face that is closest to YOUR feelings.

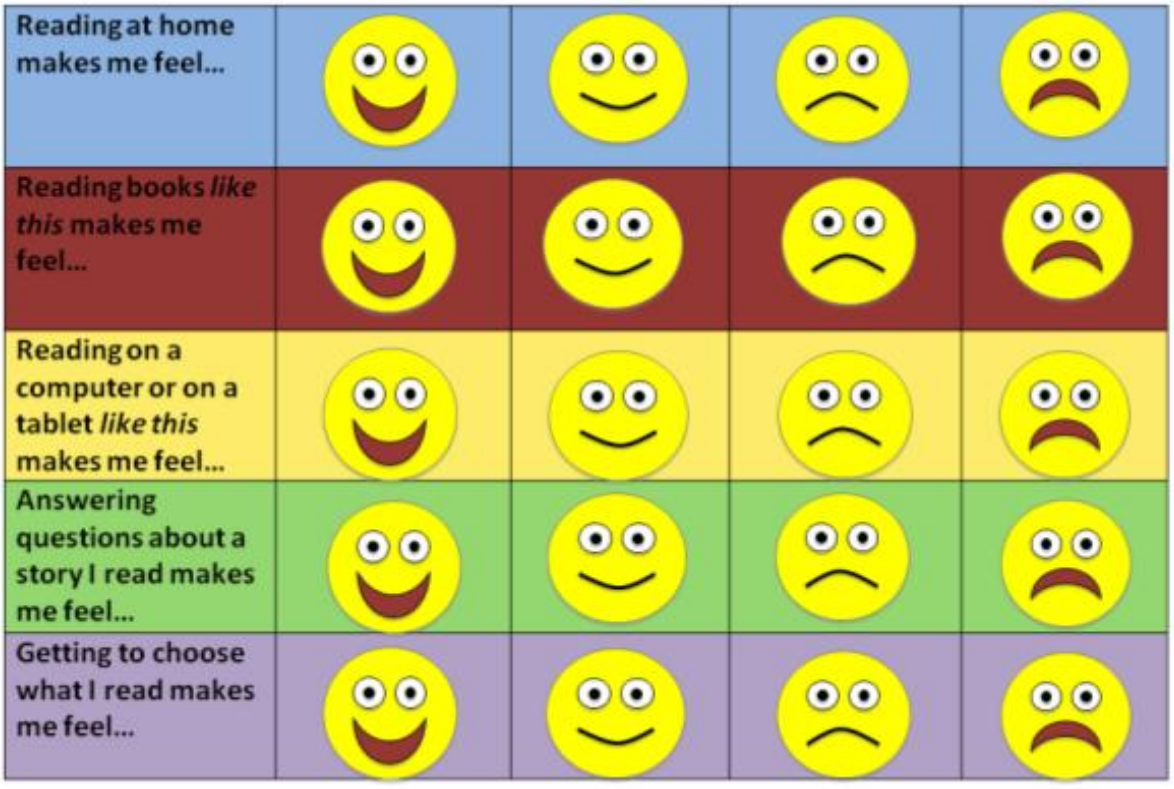
Remember, there are no right or wrong answers!

Let's start with two practice questions.

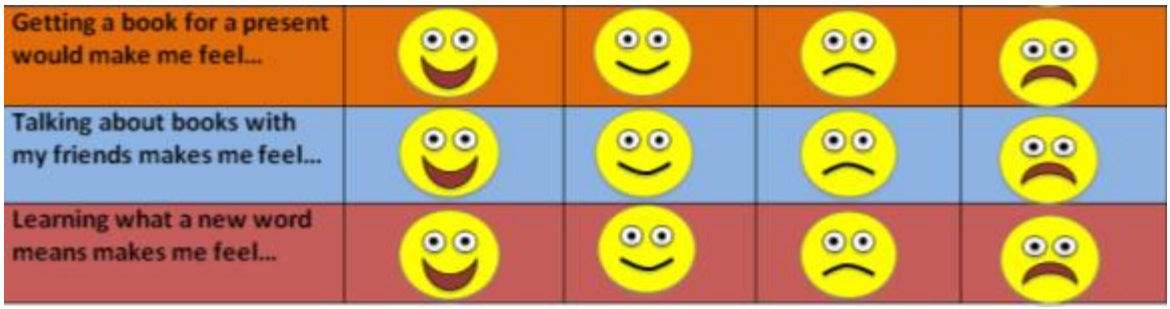
Two practice questions:



Five questions assessing Year 1 and Year 5 pupils' attitudes towards reading:



Three (additional) questions assessing Year 5 pupils' attitudes towards reading:



3. Questionnaire items used to assess pupil reading activities

Suggested description to Year 1 pupils
[Show the appropriate page (with practice questions) to the whole class.] I will now read some sentences that ask about the reading that you do.

[Point to the YES in the first question.] After I read each sentence, I want you to draw a circle around the "YES" if this is true for you.

[Point to the NO in the first question.] If the sentence is not true, I want you to draw a circle around the "NO".

Remember, there are no right or wrong answers!

Let's start with two practice questions.

[Note: "Story book" refers to books with fictional 'make-believe' stories.]

[Note: "I read…" can refer to both solo reading and guided reading with another person.]

Suggested description to Year 5 pupils
[Show the appropriate page (with the practice questions on activities) to the whole class.] Next, I will read some statements that ask about the reading that you do.

After I read each statement, I want you to draw a circle around the "YES" if this statement is true for you. If the statement is not true for you then I want you to draw a circle around the "NO".

Remember, there are no right or wrong answers!

Let's start with two practice questions.

Two practice questions:

A. I enjoy playing games	YES	NO
B. I have a favourite colour	YES	NO

Five questions assessing Year 1 and Year 5 pupils' reading activities:

I read story books at home	YES	NO
I read books with facts in them at home	YES	NO
I have a favourite book at home	YES	NO
I read stories on a computer at home	YES	NO
I read stories on a tablet *like this* at home	YES	NO

[Note: "I read story books at home" is changed to "I read fiction books" in Year 5.]

Five (additional) questions assessing Year 5 pupils' reading activities:

I read things other than stories on a computer at home	YES	NO
I read things other than stories on a tablet at home	YES	NO
I read comics or magazines at home	YES	NO
I read while going places (for example, in the car or on the bus)	YES	NO
I tell my friends about good books that I read	YES	NO

4. The Classroom Literacy Observation Schedule – Revised (CLOS-R; Louden, Rohl & Hopkins, 2008)

Twenty-seven teaching practices to be observed during literacy lessons in primary schools (yes/no).

Area	Item	Descriptor
Respect (0–3)	Rapport	*The teacher creates a warm, positive and inviting classroom where relationships with pupils encourage literacy learning*
	Credibility	*Pupils' respect for the teacher enables her to maintain order and lesson flow*
	Citizenship	*The teacher promotes equality, tolerance, inclusivity and awareness of the needs of others*
Knowledge (0–8)	Purpose	*Pupils' responses indicated tacit or explicit understanding of the purpose of the literacy task*
	Substance	*The teacher provides a lesson/task that leads to substantial literacy engagement*
	Explanation word	*The teacher clearly explains specific word, letter or sound strategies or concepts*
	Explanation sentence	*The teacher clearly explains specific grammatical strategies or concepts*
	Explanation text	*The teacher clearly explains textual strategies or concepts*
	Metalanguage	*The teacher provides pupils with language for talking about and exemplifying literacy concepts*
	Oral language	*The teacher focuses on the development of pupils' oral language*
	Oral/written language	*The teacher makes logical connections between oral and written language*
Differentiation (0–3)	Challenge	*The teacher extends and promotes higher levels of thinking in literacy learning*
	Inclusion	*The teacher differentiates literacy instruction to recognise individual needs*
	Connection	*The teacher makes connections between class or community literacy-related knowledge for individuals or groups*

Area	Item	Descriptor
Orchestration (0–8)	Awareness	*The teacher has a high level of awareness of literacy activities and participation by pupils*
	Environment	*The teacher uses the literate physical environment as a resource*
	Structure	*The teacher manages a predictable environment in which pupils understand consistent literacy routines*
	Independence	*Pupils take some responsibility for their own literacy learning*
	Pace	*The teacher provides strong forward momentum in literacy lessons*
	Transition	*The teacher spends minimal time changing activities or uses this time productively*
	Attention	*The teacher ensures that pupils are focused on the literacy task*
	Stimulation	*The teacher motivates interest in literacy through the creation of a pleasurable, enthusiastic and energetic classroom*
Support (0–5)	Assessment	*The teacher uses fine-grained knowledge of pupils' literacy performance in planning and teaching*
	Scaffolding	*The teacher extends literacy learning through reinforcement, modification or modelling*
	Feedback	*The teacher intervenes in timely, focused, tactful and explicit ways that support pupils' literacy learning*
	Responsiveness	*The teacher is flexible in sharing and building on pupils' literacy contributions*
	Persistence	*The teacher provides many opportunities to practice and master new literacy learning*

5. Statistical analytic strategy

A series of statistical analyses were carried out to estimate the impacts of the prototype coaching e-books and these were based upon differences between the 'experimental' and 'control' groups over the 2017/18 primary school summer term, at four testing points:

- At the end of the spring term (*March*; pupil questionnaires)
- One month into the summer term (*May*; classroom observations)
- Two months into the summer term (*June*; classroom observations)
- At the end of the summer term (*July*; pupil questionnaires)

Multilevel regression models were used as the statistical technique for comparing the experimental groups to one another in terms of pupils' reading activities and attitudes towards reading. Multilevel effect sizes were calculated in order to allow statistical effects linked to the use of the prototype coaching e-books to be compared in magnitude (calculated following the formulas presented in Elliot & Sammons, 2004). Differences between the two experimental groups were interpreted as meaningful when they crossed the standard academic threshold of α=0.05. Differences between the two groups were labelled with the following descriptive terms when multilevel effect sizes fell between standard academic thresholds (Cohen, 1988): 'small' (≥ 0.2 yet < 0.5 standard deviations), 'moderate' (≥ 0.5 yet < 0.8 standard deviations), and 'large' (≥ 0.8 standard deviations).

General linear models were used for comparing the experimental groups to one another based upon the teachers' practices that took place during literacy lessons. Effect sizes were again calculated, although these effect sizes differed in format to those used in the multilevel regression models (though both served the same purpose). For the general linear models, partial eta squared values (n_p^2) were calculated in order to allow statistical effects linked to the use of the prototype coaching e-book to be compared in magnitude. These estimated what proportion of teachers' classroom practice could be attributed to differences between the two experimental groups. Differences between the two experimental groups were interpreted as meaningful when they crossed the n_p^2 threshold that denoted a 'large' difference between the two experimental groups (in other words a 'large' effect size, $n_p^2 \geq 0.14$.[19]; Cohen, 1988).

The use of two different statistical techniques rather than one, and the acceptance of two different thresholds for denoting when differences would be interpreted as meaningful, was carried out for two reasons. First, multilevel regression models allowed differences between pupils to be differentiated from differences between classrooms. This was important to the aims of the evaluation and would not have possible with the general linear modelling that was used to determine if there were differences in teachers' practices during literacy lessons. Second, the number of sampled classrooms was too low (n=12) for the standard academic threshold of α=0.05 to be safely used in judging whether group differences in teachers' practices during literacy lessons could be interpreted as meaningful (i.e. there was too little statistical power). Instead, we used a threshold that was based on the size of the observed effect and report where differences are 'large' according to standard statistical criteria.

[19] And where a 'small' sized difference is indicated by a $\eta_p^2 \geq 0.01$ but < 0.06; and a 'medium' sized difference is indicated by a $\eta_p^2 \geq 0.06$ but < 0.14

Finally, in order to obtain estimates of the impact of the use of the prototype coaching e-books that were as accurate as possible, a number of additional measures were included in all statistical analyses. This were included as additional 'statistical controls' designed to minimize the influence of extraneous drivers of each outcome measure and were considered over and above the 'experimental control' that came from the use of the clustered RCT design. These measures were included because they were considered to have the potential to influence pupils' reading activities, pupils' attitudes towards reading, and teachers' practice during literacy lessons. These additional measures were:

1. Pupil gender (when comparing pupils) or proportion of girls in a class (when comparing teachers and classrooms).
2. Teacher self-reported experience (total years having taught). This we measured via teacher interview in March. Newly Qualified Teachers (NQTs) were coded 'zero' and this measure was adjusted to take into account any self-reported career breaks.
3. Teacher self-reported confidence in teaching reading. This we also measured via teacher interview in March using a 5-point rating scale where 1 was coded 'very low' and 5 'very high'.
4. Score at previous testing point. Including these measures allowed the evaluation to determine the effect of introducing the prototype coaching e-books into literacy lessons upon *changes* in pupils' attitude towards reading, *changes* in reading activities, and *changes* in teachers' classroom practice. This approach follows the 'Value Added' approach to measuring pupil progress which was previously used by the UK Department of Education[20] and which is a standard technique used in research considering the effectiveness of education.
5. Days since the first test at that testing point (either pupil test or observation of classroom practice as appropriate). This measure and the one below (6.) were 'statistical control' measures. Classes were tested at different times throughout the year. Including this information in our analyses meant that our statistical results would not be influenced by the different days at which testing was carried out across schools.
6. Days since the first test at the previous testing point (either pupil test or observation of classroom practice as appropriate).

[20] E.g. http://education.gov.uk/schools/performance/archive/schools_05/sec4.shtml

6. Statistical results: Experimental group differences in pupils' attitudes towards reading before and after the summer term 2017/18

All pupils

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	Model 1					Model 0	Model 1				
FIXED EFFECTS	B	B	SE	95% CI	p	ES	B	B	SE	95% CI	p	ES
Average reading attitude (intercept):	3.39	3.52					3.17	1.94				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		-0.11	0.11	(-0.32-0.09)	0.275	-0.15		0.29	0.14	(0.01-0.59)	0.040	0.37
Class: Year 5 classroom?		-0.02	0.02	(-0.06-0.03)	0.469	-0.03		-0.14	0.03	(-0.19--0.08)	<0.001	-0.18
Pupil: Female?		0.21	0.08	(0.05-0.37)	0.011	0.29		0.27	0.10	(0.08-0.46)	0.005	0.34
Teacher: Years' experience teaching		0.00	0.01	(-0.02-0.01)	0.830	-0.02		0.00	0.01	(-0.02-0.02)	0.894	0.02
Teacher: Confidence teaching reading		-0.03	0.06	(-0.16-0.09)	0.580	-0.07		0.07	0.07	(-0.08-0.22)	0.358	0.15
Control measure: Days since first class completed pupil questionnaires		0.12	0.10	(-0.09-0.33)	0.253	0.14		0.02	0.01	(0.00-0.05)	0.105	0.28
Control measure: Pupils' reading attitude at baseline								0.24	0.07	(0.11-0.37)	<0.001	0.45
Control measure: Days since first class completed pupil questionnaires at baseline								0.12	0.16	(-0.18-0.43)	0.427	0.13
RANDOM EFFECTS												
Unexplained Pupil-level Variance	0.55	0.52					0.69	0.62				
Unexplained Teacher-level Variance	0.00	N/A					0.09	0.00				
Intra-Class Correlation (ICC)	0.00						0.11					
% of Pupil-level Variance explained		5%						10%				
% of Teacher-level Variance explained		N/A						100%				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

Year 1

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	**Model 1**					**Model 0**	**Model 1**				
FIXED EFFECTS	**B**	**B**	**SE**	**95% CI**	**p**	**ES**	**B**	**B**	**SE**	**95% CI**	**p**	**ES**
Average reading attitude	3.45	3.16					3.42	3.46				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		-0.03	0.18	(-0.37-0.32)	0.874	-0.04		-0.08	0.20	(-0.47-0.31)	0.678	-0.10
Pupil: Female?		0.10	0.13	(-0.16-0.35)	0.457	0.13		0.16	0.14	(-0.11-0.43)	0.252	0.20
Teacher: Years' experience teaching		-0.02	0.04	(-0.10-0.06)	0.603	-0.16		0.07	0.06	(-0.04-0.19)	0.217	0.58
Teacher: Confidence teaching reading		0.08	0.15	(-0.21-0.37)	0.567	0.15		-0.30	0.25	(-0.79-0.19)	0.227	-0.57
Control measure: Days since first class completed pupil questionnaires		0.19	0.15	(-0.11-0.48)	0.206	0.22		0.05	0.03	(-0.00-0.10)	0.075	0.70
Control measure: Pupils' reading attitude at baseline								0.06	0.09	(-0.13-0.24)	0.542	0.11
Control measure: Days since first class completed pupil questionnaires at baseline								0.21	0.20	(-0.18-0.59)	0.293	0.24
RANDOM EFFECTS												
Unexplained Pupil-level Variance	0.64	0.63					0.67	0.63				
Unexplained Teacher-level Variance	0.00	N/A					0.00	N/A				
Intra-Class Correlation (ICC)	0.00						0.00					
% of Pupil-level Variance explained		2%						6%				
% of Teacher-level Variance explained		N/A						N/A				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

Year 5

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	**Model 1**					**Model 0**	**Model 1**				
FIXED EFFECTS	**B**	**B**	**SE**	**95% CI**	**p**	**ES**	**B**	**B**	**SE**	**95% CI**	**p**	**ES**
Average reading attitude	3.32	4.89					2.90	2.22				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		0.49	0.59	(-0.68-1.66)	0.406	0.81		1.97	0.84	(0.30-3.63)	0.021	3.00
Pupil: Female?		0.21	0.10	(0.02-0.41)	0.032	0.35		0.40	0.11	(0.17-0.62)	0.001	0.61
Teacher: Years' experience teaching		0.00	0.01	(-0.01-0.02)	0.684	0.00		-0.01	0.01	(-0.03-0.01)	0.420	-0.31
Teacher: Confidence teaching reading		-0.46	0.33	(-1.11-0.18)	0.157	-1.29		-0.62	0.53	(-1.67-0.44)	0.249	-1.59
Control measure: Days since first class completed pupil questionnaires		0.69	0.59	(-0.48-1.86)	0.247	0.79		0.03	0.04	(-0.05-0.10	0.464	0.21
Control measure: Pupils' reading attitude at baseline								0.52	0.09	(0.34-0.70)	<0.001	1.03
Control measure: Days since first class completed pupil questionnaires at baseline								1.55	0.84	(-0.12-3.21)	0.068	1.65
RANDOM EFFECTS												
Unexplained Pupil-level Variance	0.39	0.37					0.62	0.43				
Unexplained Teacher-level Variance	0.02	0.00					0.11	0.00				
Intra-Class Correlation (ICC)	0.05						0.15					
% of Pupil-level Variance explained		5%						31%				
% of Teacher-level Variance explained		100%						100%				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

7. Sample scenarios of OUP implementation in classrooms

Scenario 1 (Year 5 class):

Lesson Opening: Pupils entered the classroom. Each pupil had a laptop in front of them and there were only two power sockets in the classroom, one at the front and the other at the back. Pupils had to change seats in order to charge laptops that needed charging.

Synopsis of the lesson:

The topic of the lesson was 'Making predictions'. The teacher was in front of the classroom by the whiteboard where she had two lists labelled 'fiction' and 'non-fiction'. Under each heading, she had listed examples of each. She spent the first ten minutes using questioning and answers to prompt pupils to illustrate differences between the two genres.

The instruction was teacher-driven with the teacher asking all the questions. This was emphasized with her stating, "All your eyes on me". She was inconsistent in allowing pupils to answer her questions: in one instance she asked a pupil to stand up, in another she looked for pupils with hands up, and in another, she picked a pupil who was talking to his neighbour, but the pupil had no answer. The teacher did tell the pupil she would get back to him, but she never did. She had one pupil move to a solitary desk in the back because he was continuously chatting.

The pace of question and answer was fast and impatient; she did not give much wait time for pupils to answer questions. For instance, she called on one pupil who had their hand up but had no answer and remarked, "You are waving your hands and not listening." She did relate some questions to texts the class had previously read. She additionally asked higher order questions such as predicting.

The question and answer carried on for about ten minutes before the teacher then told the class that they would move on to read a text from one of the prototype coaching e-books. She had the logins and passwords displayed on the SMART board. They were asked to predict whether it would be a fiction or a non-fiction text from the title of the e-book. She reminded them to answer the questions at the end of the story and said that these were good practice towards the SATs. However, she did point out that on the real SATs, questions related to the text would refer to page numbers which the e-book did not have. One pupil had already logged in while the teacher was speaking and pressed on the speaker, which set some pupils giggling. Pupils were asked to keep the sounds off and were asked to log in to the e-book.

Pupils seemed focused and engaged with the e-book. Almost all pupils had individual laptops; a few were sharing laptops. Two pupils had to switch seats to the back of the classroom to charge the laptops. As pupils were moving from page to page, it did seem to take some time. The time pupils spent on each page varied, with some spending the entire ten minutes on the same two pages. One pupil was doing the quiz after five minutes had passed. A few pupils however were disengaged and used the time to chat. This was unnoticed by the teacher who spent a few minutes working with one pupil experiencing issues logging in. The teaching assistant was circulating around the classroom, but due to the cramped furniture, focused more on the pupils in the periphery of the classroom.

The teacher called the pupils to attention after ten minutes of reading to wrap up. She seemed rushed; her tone was anxious. She subsequently explained (to the researcher observing the lesson) that she had to cover a class at ten o'clock. She asked pupils a few questions related to the text including, "What genre?" "What type of non-fiction?" The teacher would select pupils to answer who had their hands up, but some of the pupils' answers were inaudible and she did not repeat the answer to make sure that other pupils had heard. The class ended abruptly with classroom chatter and the teacher leaving.

Scenario 2 (Year 1 class):

Lesson Opening: Teacher greeted pupils. They sat on the carpet. She went through the class list one by one: "Good afternoon [name]" and each pupil replied. This was repeated for all pupils. Pupils could reply in a language of their choosing.

The teacher read a paragraph from a fiction book (not one of the OUP e-books featuring in this evaluation) on the SMART board and interacted with the pupils on the meanings of certain words.

Synopsis of the lesson:

Pupils were engaged and enthusiastic: many pupils were seen raising their hands when the teacher asked a question and were confident in giving an answer. If the pupil didn't give a correct answer they were praised for trying and the teacher probed one or two more before giving the correct answer. The engagement was sustained by many factors, particularly the teacher's enthusiastic tone and the use of humour (for example, asking the children to imitate the sound of a cackle).

After about five minutes, the teacher asked certain pupils to go to their desks. Each group had a writing task on their desk waiting for them. During transitions, minimal time was wasted and pupils quickly got on with their tasks.

Only a group of six pupils used a prototype coaching e-book. They were using laptops and headphones. The teacher had already opened their accounts for them beforehand because she found this minimized the time needed for pupils to engage with the e-book. The pupils had approximately five to ten minutes to use the e-book. They were then asked to list adjectives on a whiteboard as additional work assigned by the teacher (most were doing this incorrectly). There was no adult supervision of the groups of pupils; the teacher was reading with only one group, but she would pop her head up occasionally to look around the classroom. The pupils seemed engaged with the reading of the e-book; they were not distracted by what others were doing.

After ten minutes, pupils were asked to put away their materials. The teacher did not check for understanding.

8. Statistical results: Experimental group differences in pupils' reading activities before and after the summer term 2017/18

All pupils

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	Model 1					Model 0	Model 1				
FIXED EFFECTS	B	B	SE	95% CI	p	ES	B	B	SE	95% CI	p	ES
Average reading activities	1.81	1.26					2.05	1.65				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		0.29	0.18	(-0.10-0.68)	0.127	0.25		-0.53	0.24	(-1.05-0.00)	0.050	-0.44
Class: Year 5 classroom?		0.08	0.04	(0.00-0.17)	0.062	0.07		0.29	0.05	(0.18-0.39)	<0.001	0.24
Pupil: Female?		-0.08	0.13	(-0.34-0.17)	0.566	-0.07		-0.31	0.15	(-0.60--0.03)	0.032	-0.26
Teacher: Years' experience teaching		-0.03	0.01	(-0.06-0.00)	0.041	-0.39		0.02	0.02	(-0.01-0.06)	0.161	0.26
Teacher: Confidence teaching reading		0.11	0.10	(-0.12-0.34)	0.309	0.16		-0.07	0.13	(-0.36-0.21)	0.590	-0.10
Control measure: Days since first class completed pupil questionnaires		-0.32	0.18	(-0.70-0.06)	0.094	-0.23		-0.04	0.03	(-0.10-0.02)	0.139	-0.31
Control measure: Pupils' reading activities at baseline								0.37	0.00	(0.25-0.49)	<0.001	0.76
Control measure: Days since first class completed pupil questionnaires at baseline								-0.50	0.27	(-1.09-0.09)	0.088	-0.35
RANDOM EFFECTS												
Unexplained Pupil-level Variance	1.39	1.39					1.63	1.42				
Unexplained Teacher-level Variance	0.11	0.00					0.54	0.02				
Intra-Class Correlation (ICC)	0.07						0.25					
% of Pupil-level Variance explained		0%						13%				
% of Teacher-level Variance explained		97%						96%				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

Year 1

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	Model 1					Model 0	Model 1				
FIXED EFFECTS	B	B	SE	95% CI	p	ES	B	B	SE	95% CI	p	ES
Average reading activities	1.61	1.48					1.43	0.62				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		0.60	0.25	(0.11-1.09)	0.018	0.54		0.23	0.26	(-0.29-0.75)	0.385	0.22
Pupil: Female?		0.00	0.18	(-0.36-0.36)	0.998	0.00		-0.10	0.18	(-0.45-0.26)	0.586	-0.10
Teacher: Years' experience teaching		-0.03	0.06	(-0.15-0.08)	0.545	-0.17		-0.12	0.08	(-0.27-0.04)	0.133	-0.74
Teacher: Confidence teaching reading		0.06	0.21	(-0.35-0.46)	0.784	0.08		0.46	0.32	(-0.17-1.10)	0.153	0.65
Control measure: Days since first class completed pupil questionnaires		-0.68	0.21	(-1.09--0.26)	0.002	-0.56		-0.06	0.03	(-0.13-0.00)	0.077	-0.64
Control measure: Pupils' reading activities at baseline								0.23	0.08	(0.05-0.37)	0.010	0.52
Control measure: Days since first class completed pupil questionnaires at baseline								-0.66	0.26	(-1.17-0.14)	0.013	-0.58
RANDOM EFFECTS												
Unexplained Pupil-level Variance	1.29	1.25					1.20	1.10				
Unexplained Teacher-level Variance	0.17	0.00					0.07	0.00				
Intra-Class Correlation (ICC)	0.12						0.06					
% of Pupil-level Variance explained		3%						8%				
% of Teacher-level Variance explained		100%						100%				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

Year 5

	Before prototype coaching e-books were deployed (March)						After one term in which the prototype coaching e-books were deployed (July)					
	Model 0	Model 1					Model 0	Model 1				
FIXED EFFECTS	**B**	**B**	**SE**	**95% CI**	**p**	**ES**	**B**	**B**	**SE**	**95% CI**	**p**	**ES**
Average reading activities	4.50	0.57					5.20	-1.45				
Experimental Group: Class that used the prototype coaching e-books in the summer term?		-1.90	2.05	(-5.95-2.14)	0.354	-0.90		-5.86	2.95	(-11.50--0.21)	0.052	-2.66
Pupil: Female?		-0.17	0.34	(-0.85-0.50)	0.613	-0.08		-0.91	0.39	(-1.68--0.15)	0.019	-0.41
Teacher: Years' experience teaching		-0.01	0.03	(-0.06-0.04)	0.574	-0.10		0.06	0.04	(-0.01-0.14)	0.109	0.55
Teacher: Confidence teaching reading		1.21	1.13	(-1.02-3.45)	0.285	0.97		2.08	1.82	(-1.53-5.69)	0.026	1.59
Control measure: Days since first class completed pupil questionnaires		-1.79	2.05	(-5.84-2.26)	0.385	-0.59		-0.11	0.13	(-0.36-0.14)	0.393	-0.29
Control measure: Pupils' reading activities at baseline								0.56	0.09	(0.38-0.74)	<0.001	1.07
Control measure: Days since first class completed pupil questionnaires at baseline								-5.01	2.86	(-10.67-0.64)	0.082	-1.59
RANDOM EFFECTS												
Unexplained Pupil-level Variance	4.57	4.48					6.71	4.85				
Unexplained Teacher-level Variance	0.00	N/A					0.51	0.00				
Intra-Class Correlation (ICC)	0.00						0.07					
% of Pupil-level Variance explained		2%						21%				
% of Teacher-level Variance explained		N/A						100%				

Notes: "Model 0": No predictors included; "Model 1": all predictors included; B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (Elliot & Sammons, 2004); Shading denotes those statistical differences and associations that were significantly unlikely to be due to chance

9. Statistical results: Experimental group differences in literacy lesson practices during the summer term 2017/18: as measured via the Classroom Literacy Observation Schedule – Revised (CLOS-R; Louden, Rohl & Hopkins, 2008)

Total Score

CLOS-R: Total Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	SE	95% CI	p	ES	B	SE	95% CI	p	ES
Experimental Group: Class that used the prototype coaching e-books in the summer term?	-4.29	4.50	(-15.86-7.27)	0.384	0.15	-8.66	2.14	(-15.46--1.95)	0.027	0.85
Class: Year 5 classroom?	-1.10	0.92	(-3.47-1.26)	0.284	0.22	-2.10	0.56	(-3.88-0.32)	0.033	0.83
Class: Proportion of class female	-16.34	27.01	(-85.76-53.08)	0.572	0.07	-22.42	12.44	(-62.02-17.18)	0.169	0.52
Teacher: Years' experience teaching	0.15	0.26	(-0.53-0.83)	0.603	0.06	0.50	0.12	(0.12-0.87)	0.025	0.85
Teacher: Confidence teaching reading	2.37	2.08	(-2.99-7.73)	0.307	0.21	-0.46	0.98	(-3.56-2.64)	0.670	0.07
Control measure: Days since the first observation of a literacy lesson	-0.12	0.20	(-0.32-0.40)	0.580	0.07	0.14	0.06	(-0.06-0.33)	0.114	0.62
Control measure: Total Score in May						0.31	0.24	(-0.46-1.07)	0.290	0.35
Control measure: Days since the first observation of a literacy lesson in May						0.08	0.08	(-0.17-0.32)	0.393	0.25

Notes: B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

Subscale 1: Respect

CLOS-R: 'Respect' Subscale Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	**SE**	**95% CI**	**p**	**ES**	**B**	**SE**	**95% CI**	**p**	**ES**
Experimental Group: Class that used the prototype coaching e-books in the summer term?	0.05	0.34	(-0.81-0.91)	0.888	0.00	0.34	0.50	(-0.95-1.62)	0.530	0.08
Class: Year 5 classroom?	-0.15	0.07	(-0.33-0.02)	0.075	0.50	-0.25	0.12	(0.56-0.06)	0.094	0.46
Class: Proportion of class female	-0.37	2.01	(-5.55-4.80)	0.860	0.01	0.48	3.78	(-9.24-10.19)	0.905	0.00
Teacher: Years' experience teaching	0.01	0.02	(-0.04-0.06)	0.745	0.02	0.00	0.03	(-0.09-0.09)	0.993	0.00
Teacher: Confidence teaching reading	0.25	0.16	(-0.15-0.65)	0.169	0.34	0.51	0.31	(-0.28-1.30)	0.159	0.35
Control measure: Days since the first observation of a literacy lesson	0.01	0.02	(-0.03-0.05)	0.604	0.06	-0.01	0.02	(-0.05-0.03)	0.610	0.06
Control measure: 'Respect' Subscale Score in May						N/A*				
Control measure: Days since the first observation of a literacy lesson in May						N/A*				

Notes: *Not included due to the perfect correlation (r=1) between these scores in May and June. Only two classrooms (of 12) changed, and both dropped one point from May to June. B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

Subscale 2: Knowledge

CLOS-R: 'Knowledge' Subscale Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	SE	95% CI	p	ES	B	SE	95% CI	p	ES
Experimental Group: Class that used the prototype coaching e-books in the summer term?	-1.13	1.98	(-6.22-3.95)	0.591	0.06	-3.52	0.41	(-4.84--2.20)	0.003	0.96
Class: Year 5 classroom?	-0.10	0.40	(-1.14-0.94)	0.820	0.01	-0.41	0.09	(-0.70--0.13)	0.019	0.88
Class: Proportion of class female	2.76	11.87	(-27.76-33.28)	0.825	0.01	-2.56	2.49	(-10.49-5.36)	0.379	0.26
Teacher: Years' experience teaching	0.17	0.12	(-0.13-0.47)	0.200	0.30	0.33	0.03	(0.24-0.42)	0.001	0.98
Teacher: Confidence teaching reading	0.09	0.92	(-2.26-2.45)	0.924	0.00	-1.92	0.18	(-2.50--1.33)	0.002	0.97
Control measure: Days since the first observation of a literacy lesson	-0.08	0.09	(-0.31-0.15)	0.405	0.14	0.05	0.01	(0.02-0.08)	0.018	0.88
Control measure: 'Knowledge' Subscale Score in May						0.00	0.09	(-0.28-0.29)	0.003	0.96
Control measure: Days since the first observation of a literacy lesson in May						0.04	0.02	(-0.02-0.11)	0.126	0.60

Notes: B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

Subscale 3: Orchestration

CLOS-R: 'Orchestration' Subscale Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	**SE**	**95% CI**	**p**	**ES**	**B**	**SE**	**95% CI**	**p**	**ES**
Experimental Group: Class that used the prototype coaching e-books in the summer term?	-1.23	1.51	(-5.11-2.65)	0.451	0.12	-3.18	1.34	(-7.44-1.07)	0.097	0.66
Class: Year 5 classroom?	-0.32	0.31	(-1.11-0.48)	0.351	0.17	-0.72	0.35	(-1.84-0.40)	0.132	0.59
Class: Proportion of class female	-8.10	9.06	(-31.38-15.18)	0.412	0.14	-10.36	8.94	(-38.81-18.09)	0.330	0.31
Teacher: Years' experience teaching	-0.01	0.09	(-0.24-0.22)	0.930	0.00	0.08	0.07	(-0.13-0.29)	0.296	0.35
Teacher: Confidence teaching reading	0.68	0.70	(-1.12-2.48)	0.376	0.16	1.19	0.60	(-0.72-3.11)	0.141	0.57
Control measure: Days since the first observation of a literacy lesson	0.01	0.07	(-0.17-0.18)	0.925	0.00	0.05	0.04	(-0.09-0.18)	0.362	0.28
Control measure: 'Orchestration' Subscale Score in May						0.46	0.48	(-1.07-2.00)	0.407	0.24
Control measure: Days since the first observation of a literacy lesson in May						0.02	0.05	(-0.15-0.19)	0.706	0.05

Notes: B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

Subscale 4: Support

CLOS-R: 'Support' Subscale Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	**SE**	**95% CI**	**p**	**ES**	**B**	**SE**	**95% CI**	**p**	**ES**
Experimental Group: Class that used the prototype coaching e-books in the summer term?	-1.72	1.88	(-6.56-3.13)	0.404	0.14	-1.24	0.10	(-1.55--0.92)	0.001	0.98
Class: Year 5 classroom?	-0.32	0.39	(-1.31-0.67)	0.447	0.12	-0.35	0.03	(-0.43--0.27)	0.001	0.99
Class: Proportion of class female	-10.68	11.31	(-39.74-18.38)	0.388	0.15	-2.18	0.68	(-4.33--0.03)	0.048	0.78
Teacher: Years' experience teaching	-0.03	0.11	(-0.32-0.25)	0.771	0.02	0.10	0.00	(0.09-0.12)	<0.001	1.00
Teacher: Confidence teaching reading	1.15	0.87	(-1.10-3.39)	0.245	0.26	-0.51	0.05	(-0.67--0.35)	0.002	0.97
Control measure: Days since the first observation of a literacy lesson	-0.02	0.08	(-0.23-0.20)	0.848	0.01	0.00	0.00	(-0.01-0.01)	0.427	0.22
Control measure: 'Support' Subscale Score in May						0.39	0.03	(0.29-0.49)	0.001	0.98
Control measure: Days since the first observation of a literacy lesson in May						-0.03	0.00	(-0.04--0.02)	0.004	0.96

Notes: B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

Subscale 5: Differentiation

CLOS-R: 'Differentiation' Subscale Score	One month into the summer term 2017/18 (May 2018)					Two months into the summer term 2017/18 (June 2018)				
	B	**SE**	**95% CI**	**p**	**ES**	**B**	**SE**	**95% CI**	**p**	**ES**
Experimental Group: Class that used the prototype coaching e-books in the summer term?	-0.26	0.65	(-1.93-1.40)	0.702	0.03	-1.10	1.09	(-4.57-2.38)	0.389	0.25
Class: Year 5 classroom?	-0.22	0.13	(-0.56-0.12)	0.160	0.35	-0.47	1.22	(-1.92-0.92)	0.726	0.05
Class: Proportion of class female	0.05	3.89	(-9.94-10.04)	0.990	0.00	-4.49	6.24	(-24.34-15.37)	0.524	0.15
Teacher: Years' experience teaching	0.01	0.04	(-0.09-0.11)	0.793	0.02	0.04	0.07	(-0.17-0.25)	0.569	0.12
Teacher: Confidence teaching reading	0.21	0.30	(-0.57-0.98)	0.525	0.09	0.35	0.51	(-1.27-1.97)	0.543	0.14
Control measure: Days since the first observation of a literacy lesson	-0.04	0.03	(-0.11-0.04)	0.261	0.24	0.05	0.05	(-0.09-0.20)	0.329	0.31
Control measure: 'Differentiation' Subscale Score in May						-0.47	1.22	(-4.34-3.41)	0.726	0.05
Control measure: Days since the first observation of a literacy lesson in May						-0.02	0.05	(-0.17-0.13)	0.690	0.06

Notes: B: Unstandardized regression estimate; SE: Standard Error; 95% CI: 95% confidence interval; p: probability that the difference or association is due to chance alone; ES: Effect Size (proportion of variance explained by this measure [partial eta squared; η_p^2]); Shading denotes those statistical differences and associations that were 'large' in effect size ('large' meaning a η_p^2 Effect Size ≥ 0.14; Cohen, 1988)

10. The print material developed and used by OUP for introducing the (experimental group) teachers to the prototype coaching e-books

Evaluation of *Oxford Reading Buddy*: Digital Coaching Books

Prototypes of SEVEN *Oxford Reading Buddy* digital coaching books will be supplied for the purposes of this evaluation.

In the first instance THREE titles aimed at readers in Year 1 and TWO aimed at readers in Year 5 will be available in each child's personal online library. One further title will be released to each year in mid-June (it will automatically populate each child's library) – making the total for Year 1 pupils FOUR titles and the total for Year 5 pupils THREE titles. However, it is worth noting that the Year 5 pupils will also have access via their library to the Year 1 titles so after the last release they will have all SEVEN books in their library to read and re-read. The mid-June release of one additional title will sync with a visit from Southampton University as the researchers would like to observe the children reading a text and/or taking a quiz, so we will release a new title onto each child's bookshelf just ahead of the researchers' scheduled visits.

The prototype is available at this secure URL: [xxxxxxxxxx]

Each pupil involved in the evaluation – and each teacher – will be given their own, anonymous user name and password. Pupils can use this user name and password to access the digital coaching books both in school and at home. However we ask that any home access is only supplementary to the children accessing the books at school and not be the only time that they log in. This is because we would like the teachers involved in the study to be able to observe how the children interact with the reading service in order to inform their professional judgement. If the children only ever log in from home this won't be possible.

What's the main purpose of these digital coaching books and when should I use them?

The digital coaching books are primarily designed for use by children during **individual, independent reading** time. This might occur:

- during a planned/structured part of the school day – e.g. during a guided reading session (*i.e. these books would be used by children who are NOT involved in the guided reading session with the teacher and/or TA*)
- informally within school – e.g. during breakfast or after-school provision, wet break times, or at other times in the school day when children are asked to read on their own (they are accessible on an iPad)
- at home – either as part of the school's normal 'home reading' routine or as a set homework. However as stated above, this use must only be supplementary for the purposes of this prototype study

The **main purpose** of these digital coaching books is to give the reader some **one-to-one input** during reading, much like an expert adult would if there were enough expert adults to go around! The child's buddy will prompt, model and question the child, focusing on one of seven key comprehension strategies (such as visualization, comprehension monitoring or inference) during reading and there is a comprehension quiz (assessment) at the end.

The aim is to make the independent reading session just a little more active and thoughtful than it might otherwise be, with the result that children read, engage with and deepen their understanding of not just these digital coaching books, but all the books they read.

Data from the assessments is designed to provide the teacher with evidence of the specific aspects of comprehension that a child is good at or struggling with – e.g. vocabulary, inference. NOTE: In the final service, data will be gathered about the child's level of engagement with the buddy (i.e. how many of the Reading Buddy's comments they listened to and how they did on the supportive questions within the book) but this is not possible within the prototype.

Alternative uses of the digital coaching books

During previous research with schools, teachers identified that they might also use the digital coaching books in small group or guided reading sessions, particularly where these sessions are being run by a teaching assistant or inexperienced teacher. They identified that the buddy prompts/questions can be used to frame the session and save teacher planning time.

If you wish to use the books in this way – or in other contexts – that is absolutely fine and will be useful to the evaluation.

What kit will I need to be able to use these digital coaching books?

Access to broadband/Wi-Fi will be required at all times; these digital coaching books are not 'downloadable' for use offline.

In order to support individual, independent reading of these digital coaching texts, each child will need their own device (computer, laptop or iPad) and a set of headphones if audio support is required and noise levels in the class need managing. (Audio support is provided throughout for Year 1 but only sparingly for Year 5. Audio can be turned off at any time.)

How long does a child need to spend with each digital coaching book?

Each digital coaching book has been specially written to support short, focused reading sessions of approximately 15–30 minutes.

For the Year 1 titles, two sessions of approximately 15–20 minutes per title will be needed for most children to complete one of the coaching books and the associated quiz. The book can be re-read at any time so children can re-visit in subsequent sessions, but the associated quiz can only be taken once. There is a prompt to ensure that children are happy with their answers before submitting the quiz. They can re-visit the associated book at any point while completing the quiz.

For the Year 5 titles, two to three 30-minute sessions will be needed for most children to read and complete a coaching book and the associated quiz. Again, the coaching book can be revisited at any time but the quiz can only be submitted once.

How often should a child read a digital coaching book?

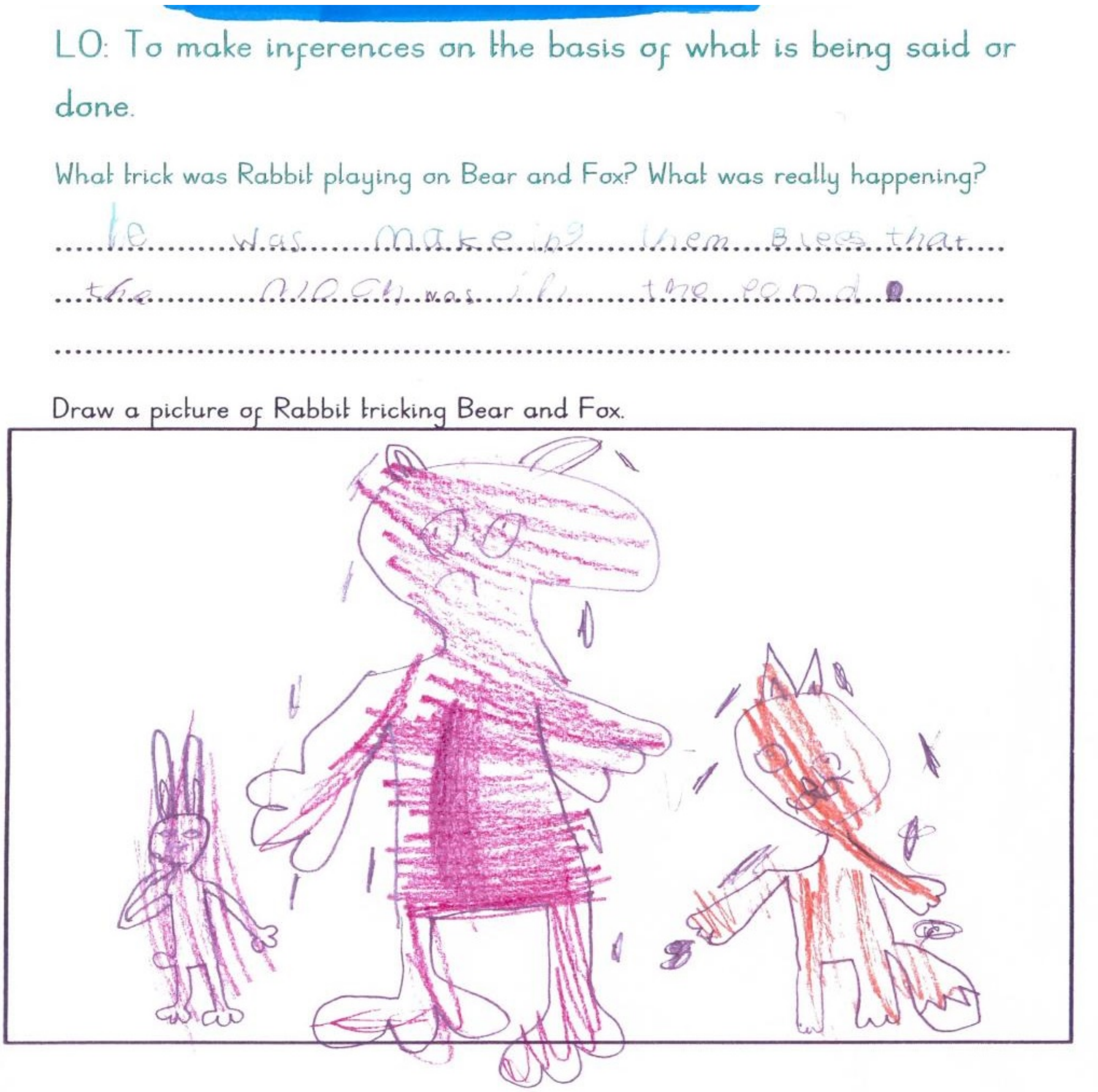
The digital coaching books are designed for occasional use – as part of children's wider reading experience.

Please feel free to slot the use of the coaching books into whatever routine works best for you – which might well be different across the classes involved in the evaluation. It is the school's responsibility to ensure all children gain access to the books at some point in whichever scenario (independent reading in the ICT suite, guided reading in the classroom, before or after school access, etc) works best for your school and class. We welcome your professional judgement to decide how best to integrate the reading service into your teaching.

Any feedback you can provide about the optimum or typical frequency of use (be it more or less than recommended) will be really valuable in informing how many of these coaching books we develop and how we advise other schools.

If you have any questions about the logistics of implementing the *Oxford Reading Buddy* prototype in your school, please do not hesitate to contact [xxxxxx] at Oxford University Press.

11. Teacher-created drawing activities (for Year 1 pupils) that linked the use of the prototype coaching e-books to the broader learning objectives of the class: Four examples completed by pupils


LO: To make inferences on the basis of what is being said or done.

What trick was Rabbit playing on Bear and Fox? What was really happening?

he was makeing them Bless that the moon was in the pond.

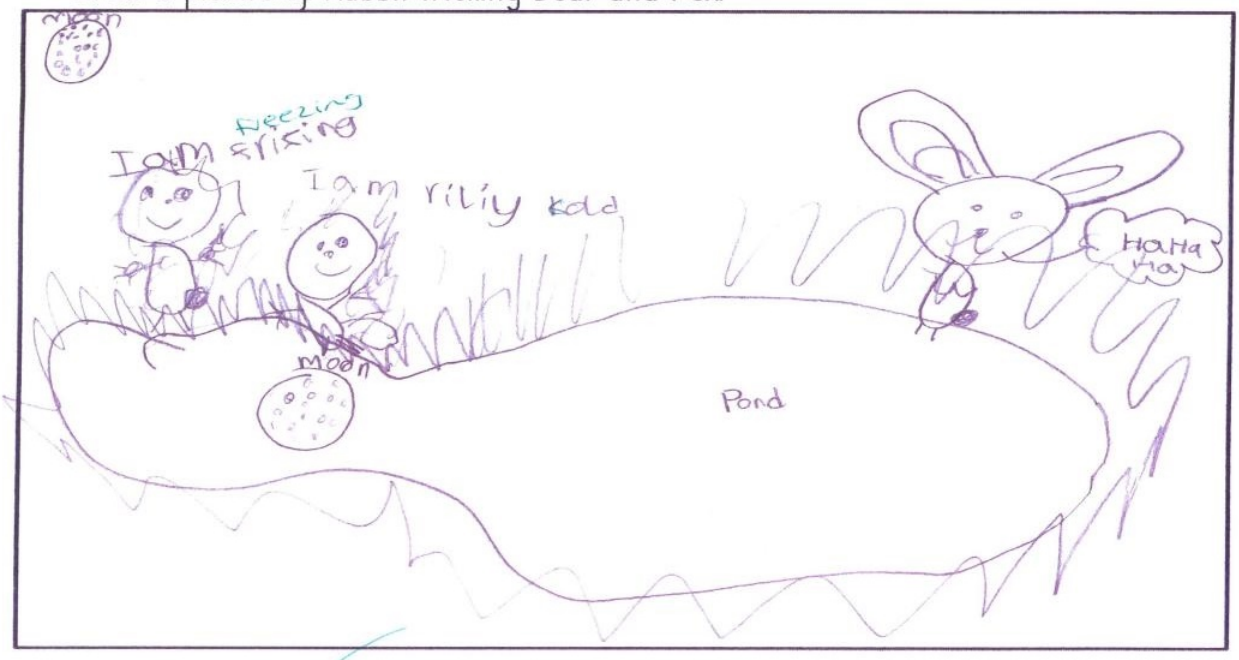
Draw a picture of Rabbit tricking Bear and Fox.

LO: To make inferences on the basis of what is being said or done.

What trick was Rabbit playing on Bear and Fox? What was really happening?

That the moon was in the Pond but
It was a reflection of the moon.

Draw a picture of Rabbit tricking Bear and Fox.

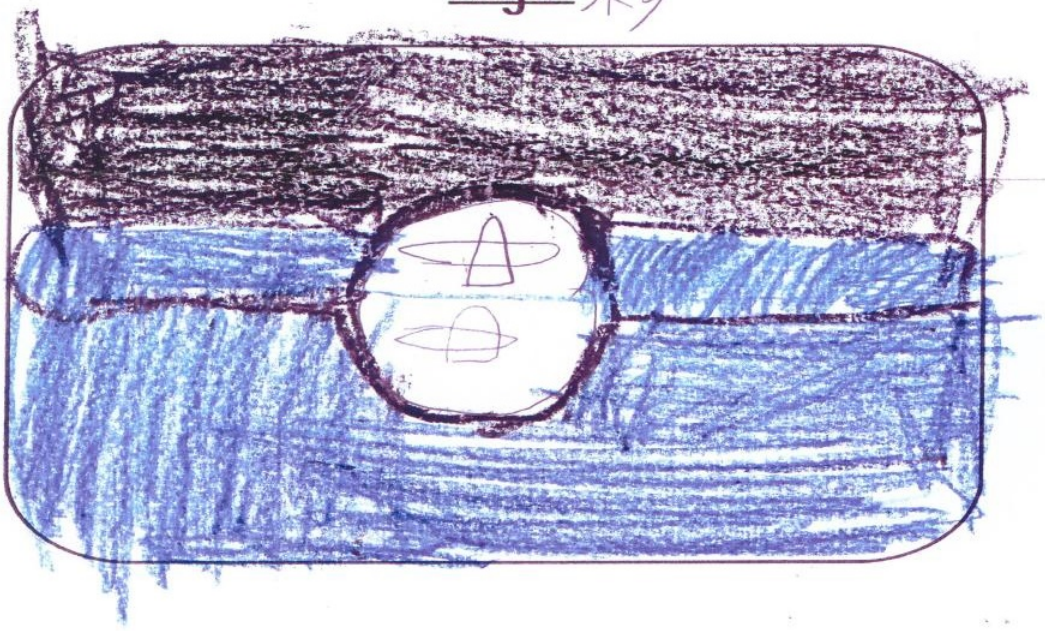


Lovely work!

LO: to discuss new word meanings and link new meanings to those already known.

We have been learning about homophones. To show you understand the meaning of these two words that sound the same- draw a picture in each box.

Night sky



L.O. to discuss new word meanings and link new meanings to those already known.

We have been learning about homophones. To show you understand the meaning of these two words that sound the same- draw a picture in each box.

Night

Knight

Glossary of Key Terms

Coaching buddy feature:	An icon within an e-book text that an individual can click on. This prompts a 'reading buddy' character to come up on the screen with a conversation bubble that contains a question. The question prompts the reader to use higher order thinking skills pertaining to content covered or to anticipate upcoming events
Control group:	A group within which no intervention is applied. Created in order to facilitate comparisons with an experimental group. When random assignment differentiates who is in which group, this maximizes the likelihood that any differences observed between the two groups are due to the intervention
Experimental group:	A group within which an intervention is applied. Created in order to measure observable (or measurable) differences due to the intervention by comparing this group to another (often a control group)
Perceived impact:	The opinions of teachers regarding what effect(s) they believe the introduction of the prototype coaching e-books have had for their literacy lessons and for the pupils in their class
Possible impacts on teachers:	Potential consequences that could shape the teaching and learning practices of a teacher with the potential for secondary consequences for whether or not a teacher will take up an intervention
Statistically significant:	The likelihood that a statistical association or a statistical difference is due to more than just chance
Text-to-speech:	The ability of an e-book to convert the written word into audio
Upstream evaluation:	A form of evaluation carried out with an intervention/product while it is still in development (as opposed to a Downstream evaluation carried out with a product after it has been launched). The purpose of an Upstream evaluation reflects this relationship to the development of the intervention/tool: It should contribute to development of the product prior to its launch via the findings of the evaluation